Available online at www.sciencedirect.com

ScienceDirect

Current Opinion in Psychology

Dominance, prestige, and the role of leveling in human social hierarchy and equality

Joey T Cheng

How humans and other social species form social hierarchies is one of the oldest puzzles of the behavioral and biological sciences. Considerable evidence now indicates that in humans social stratification is principally based jointly on *dominance* (coercive capacity based on strength, threat, and intimidation) and *prestige* (persuasive capacity based on skills, abilities, and knowledge). Although intimidation can beget compliance, hierarchical relationships based on dominance are relatively less stable. Here, I consider the costs and benefits of each form of hierarchical structure for high-ranking and low-ranking individuals, and propose that humans have evolved a tolerance for stratification based on prestige and a resistance towards coercive dominance. In humans (and other social primates), anti-dominance instincts often escalate into large-scale coordinated leveling efforts to suppress the power of coercive aggrandizers. By contrast, prestige, which produces mutually beneficial outcomes with followers, is recognized and widely endorsed.

Address
Department of Psychology, York University, 4700 Keele Street, Toronto, ON, M3J 1P3, Canada

Corresponding author: Cheng, Joey T (chengjt@yorku.ca)

Current Opinion in Psychology 2020, **33**:238–244

This review comes from a themed issue on **Power, status and hierarchy**

Edited by **Gerben van Kleef** and **Joey Cheng**

https://doi.org/10.1016/j.copsyc.2019.10.004

In most group-living species, although one's survival depends on social success in forming affiliative alliances and coordinating with conspecifics, group living also necessarily entails zero-sum conflict over the distribution of valuable resources. Surviving requires out-competing others who are pursuing the same resources. Thus, across species, individuals' priority of access to contested resources — their social rank, or position in the social hierarchy — is a key determinant of survival. Thus, much research across the behavioral and biological sciences seeks to identify how individuals compete and succeed in gaining social rank, in order to understand how and why inequality and stratification arise within groups and societies.

Imposing force-based rank via dominance

Traditional approaches have focused on asymmetries of deference and privilege among social animals as principally organized around dominance — rank differences established from the history of frequent wins and losses in agonistic fights based on force and aggression [1,2]. In dominance encounters, deference results from fear and intimidation created by the high-ranking individual's greater formidability (usually due to their larger size) and the low-ranking (usually physically weaker) individual's recognition of their relatively lower resource-holding potential, who will concede before escalating to costly conflicts, benefiting all parties.

A dominance hierarchy is formed when these past agonistic outcomes begin to produce consistency and regularity in the patterns of deference and acquiescence [3], which are further reinforced by occasional bouts of mild aggression from dominants as a reminder of their formidability [4,5]. In established hierarchies, the 'haves' routinely receive privileged and prioritized access to desirable resources, mates, territory, grooming, and decision-making influence over conspecifics (i.e. social rank), whereas the 'have-nots' must recognize and accept their position in the hierarchy and relinquish their access to these commodities (even if begrudgingly) without overt contest or provocation most of the time [6].

Earning freely conferred rank via prestige

More recent approaches, however, begin to recognize that human interpersonal asymmetries are not simply an extension of dominance hierarchies. Humans possess a second avenue to social rank: prestige [7,8•]. Across societies, humans seek out and defer — out of personal choice — to people who possess skills, attributes, and locally valued knowledge attributes that inspire respect [8•,9–11]. Even in the most egalitarian hunter-gatherers, rank disparities emerge informally based on differences in perceived success, with highly influential leaders exercising differential weight and influence over key decisions and opinions in the community [12•,13]. The so-called 'Big Man' leaders in many of these small-scale societies lack coercive authority over others; rather their influence depends entirely on the ability to attract followers, which derives from possessing and deploying skills that generate benefits for others.

Key to the distinction between the two avenues to rank, these within-group prestige asymmetries do not appear to be products of any agonistic coercion or imposition (as they are in dominance-based hierarchies), but rather result from non-agonistic persuasion that is freely conferred. In exchange of the deference received, prestigious individuals may supply a flow of benefits, from transmitting culturally valued knowledge [8•], motivating group-wide cooperation [14], to contributing to collective action [15–17]. Because these benefits are maximized through proximity and prolonged interaction with those who can supply these benefits, prestige hierarchies likely shaped the evolution of our proximate emotions and ethologies (e.g. liking, respect, admiration), such that we actively seek contact with prestigious people, pay them extra attention, and shower them with favors and deference displays [8•,18]. By contrast, dominance hierarchies are stabilized by submissive emotions and ethological displays (e.g. fear, shame, gaze aversion) that result in the avoidance of coercive aggrandizers and the harm that they may inflict [19,20]. Importantly, both forms of rank, as relationships between individuals, reflect outcomes created by perceptions of that individual, rather than as an intrinsic absolute property of an individual [1]. Group members concede resources (including deference) to higher ranked individuals to avoid harm or gain certain benefits.

A brief review of current evidence on two avenues to social rank

There is now much empirical evidence supporting key predictions from this theory, both in the laboratory and in the field (reviewed in Refs. [8•,15,21•,22,23]). Supporting this broad view of two distinct social hierarchies, these lines of evidence indicate: (a) sharp differences between the behavioral and psychological traits of higher-ups in dominance hierarchies versus those in prestige hierarchies; (b) higher-ups in the two hierarchies receive qualitatively disparate patterns of deference from lower-ranking subordinates; and (c) higher-ups in both hierarchical structures enjoy greater privileges and access to desirable resources and social rank.

Distinguishing between higher-ranking individuals at the top rungs of a dominance versus prestige hierarchy

Perhaps unsurprisingly, because cultivating fear or earning respect is requisite for gaining social rank, dominant or prestigious individuals typically display traits and behaviors that most effectively enhance their perceived threat or ability to confer benefits. Prestigious individuals — in contrast to dominant individuals — possess exceptional skill or knowledge in locally valued domains (which may vary across groups), including those crucial to survival in small-scale societies such as warrior skills, medicinal knowledge, and hunting and fishing ability [24–28]. Prestigious individuals tend to be kind, humble, prosocial, and exceptionally generous [14,29–32], likely because supplying public goods broadcasts one's abilities and further elevates prestige and motivates group-wide cooperation through imitation [14,33,34].

By contrast, dominants are disinclined towards behaving prosocially, but instead exhibit antagonism, aggression, and hubris, and the prioritization of self-interest over collective good [35–40]. Ethologically, dominance (unlike prestige) is associated with vocal, facial, and postural patterns that signal threat and formidability, such as a deeper pitch profile, signals of anger, facial masculinity, and elaborate and expansive pride displays [8•,41–46]. These two forms of rank in humans, and their underlying psychological and behavioral differences, have also long been noted in anthropological ethnographies across a range of simpler societies [12•,15,47] (reviewed in Ref. [8•]).

Distinguishing between lower-ranking individuals at the bottom rungs of a dominance versus prestige hierarchy

Paralleling these distinct patterns among the high-ranking, lower-ranking individuals in the two hierarchies display contrasting deference patterns. Group members feel admiration and seek proximity towards prestigious individuals (but not dominants), and readily learn and acquire their beliefs, values, and practices [25,48–52] (reviewed in Ref. [11]), even when it comes to domains beyond the prestigious person's area of expertise [24,36,53]. Greater social and coalitional support, both with kin and non-kin, also accrue to those with a prestigious (but not a dominant) reputation [21•,28,36,49,54]. Through these alliances and cooperative bonds with the prestigious, lower-ranking followers are able to reciprocally acquire a range of benefits, including knowledge transfer [8•,51], increased social standing [30], and improved collective action generated directly by the prestigious individual [14,16]. Followers are even more tolerant of norm violations on the part of prestige-based (compared to dominance-based) leaders, owing to greater trust in their moral standing [55]. In sharp contrast, deference in a dominance hierarchy is stabilized by fear, stress, and avoidance behavior [12•,21•,22,56], which help avoid the costs of challenge and conflict.

Higher-ranking individuals in both hierarchies gain greater privileges and access to contested resources (e.g. social influence, reproductive opportunities)

Finally, looking beyond these underlying differences, multiple lines of evidence indicate that prestige and dominance provide a foundation for social rank. In a study of small 'minimal' laboratory groups, dominance and prestige co-emerged as distinct strategies for gaining social rank (informal leadership) [21•]. Rank was assessed using peers' judgments of relative influence, uninvolved outside observers' judgments of influence, actual behavioral impact over collective decision-making, and eye-tracked differential gaze and attention. Furthermore,

both men and women with dominance or prestige gained higher rank than their same-sex peers [21•]. Similar patterns are revealed in a range of naturalistic groups and teams in the field (e.g. sports teams, chess clubs, volunteer groups, student teams) [29,36,49].

Cross-culturally, anthropological evidence from small-scale societies suggests that influential members of the community (both formally and informally) possess traits and attributes that typically translate into greater ability to inflict harm (e.g. being feared, fighting ability, physical strength) or to confer benefits on others (e.g. being respected, expertise, intelligence and cognitive skills, contribution to collective action, food production skills, ethnomedicinal plant knowledge), or a combination of both [12•,15,26,28,57]. Thus, even among the most egalitarian societies, dominants appear able to dominate and gain deference despite strong cultural emphasis on equality and respect for individual autonomy. Such evidence of dominance-based and prestige-based political leadership in small, kin-based societies with highly egalitarian social norms — features that may bear resemblance to the living conditions of early humans — suggest the possibility that the two forms of rank may have been ubiquitous even in ancestral societies.

Finally, individuals who acquire more dominance or prestige have higher fitness in diverse societies [58,59], though possibly through different routes. A study of the Tsimane' in the Bolivian Amazon found that while both forms of rank are associated with higher intra-marital fertility and extra-marital affairs, prestigious men have lower offspring mortality (possibly reflecting their greater investment in parenting effort) and longer reproductive careers, whereas dominant men marry younger, more fertile wives [60] (reviewed in Ref. [13]).

The limitations of force: dominance is more volatile than prestige as an avenue to social rank

Although intimidation can beget rank, recent evidence highlights a key caveat: rank achieved via dominance may be more volatile than prestige. A longitudinal study of the dynamics of influence reveals that the influence advantage of dominant individuals erodes over time in small, collaborative, and relatively egalitarian social groups [61•]. Among the student project teams examined, dominant individuals indeed gained substantial influence over collective decisions during the initial negotiation of rank when groups first formed. However, their differential impact declined sharply and even ceased by the fourth week mark, despite sustaining a dominant reputation. In sharp contrast, the influence wielded by prestigious individuals augmented (rather than diminished) over the four-month period studied [61•]. Thus, coercing one's way to power appears to be a relatively precarious strategy that may yield variable results across time and contexts. While efficacious in certain groups and over certain periods, dominance may fail to deliver in other contexts.

Why is dominance volatile? The resentment of force and dominance-leveling coalitions

While dominant tyrants are common enough, their power does not go unchecked. In many primates, coalitions of lower-ranking individuals will coordinate to resist, ostracize, or (at the extreme) execute overly coercive dominant alphas [62,63,64•]. Leveling coalitions in humans are distinguished by their larger size, longevity, and greater effectiveness relative to other primates [64•], possibly owing to our species' ability to leverage language and lethal weapons to reduce coordination costs and power disparities [62,65]. The increased volatility of dominance in human societies may thus reflect evolved leveling sentiments that result in the suppression of dominance-based hierarchies.

When does the resentment of tyrants escalate to overt acts of counter-dominance? Because coercion is maintained by the avoidance of harm (rather than the provision of benefits), coercive dominants are tolerated only to the degree that they continue to possess relative power to inflict costs, and the price of subordination is outweighed by the risks of challenging the status quo [66]. In response to threats to their power, dominants may safeguard their interests by actively seeking to undercut the ability of subordinates to ally against them, including deploying their political allies against dissenters [67], restricting the flow of information [35], and undermining social cohesion [68]. Thus, to further their quest for autonomy, subordinate leveling coalitions must overcome both the high-ranking dominant's attempts to manipulate and quell anti-hierarchical behavior, and the challenges inherent to successful collective action (e.g. mobilizing participants, monitoring of leveling investment and effort, coordinating logistics), which entail shared gains (e.g. reduced domination by higher-ranking individuals) and individual risks (e.g. retaliation, injury) [69]. Nevertheless, when successful, leveling coalitions can reduce power differentials by pooling collective resistance efforts among subordinates [70], while lowering the individual cost of challenge (e.g. risk of injury, coordination costs). Proximately, leveling is likely expressed and reinforced by a suite of emotional, cognitive, and motivational mechanisms [71–73], including egalitarian-favoring moral values such as autonomy, anti-domination, inequity aversion, empathy, compassion, and a distaste for displays of arrogance and aggrandizement [67,74–77]. Much evidence suggests that anti-oppression impulses are present even among infants [78–83] (reviewed in Ref. [84]), thus developing early without extensive learning and requiring relatively little complex conscious reasoning.

Why is prestige durable? The endorsement of merit and mutually benefiting relationships

While anti-dominance is a common phenomenon, no comparable anti-hierarchical sentiments, resistance, or collective aggression seem to be directed at prestigious individuals. In fact, beyond the mere absence of prestige-leveling coalitions, higher-ranking individuals in a prestige hierarchy are even rewarded, endorsed, and freely deferred to by those who rank below them [8•,28], which clearly contrasts with the dominance-limiting propensities described above. Deference, rather than resistance, towards prestigious individuals allows followers to gain access to and acquire the benefits that prestigious individuals can confer, including knowledge transfer and exceptional contributions to collective action [8•,16]. In contrast, those with a prestigious reputation are unlikely to supply these benefits if not 'paid' for their efforts, or may alternatively seek to supply benefits to other willing followers [8•,17,85–87]. These mutually benefitting exchanges that emerge between prestigious individuals and their followers may have shaped our moral systems: people equate fairness with equitable earnings proportionate to effort [88,89], prefer merit-based systems and institutions [90–92], and are fiercely concerned with a leader's perceived legitimacy [88,89,92,93]. These moral principles in turn act to reinforce and stabilize prestige-based deference [61•].

Still, against this backdrop of relatively greater tolerance of prestige differentials [94], prestige-based inequality may nevertheless be contested and constrained when prestige-follower relations fail to generate mutual benefits. In the most egalitarian hunter-gatherers, for example, strong 'demand sharing' norms lead to widespread sharing of resources with both kin and non-kin. This scale of sharing, coupled with the lack of resource storage and wealth accumulation, produces strict economic equality among group members, suppressing greater resource acquisition even in the prestigious. For example, in many forager societies, successful hunters neither exercise rights to distribute the meat, nor are their families entitled to a larger share [95]. Likewise, in modern small-scale societies such as the Tsimane, elected leaders who are highly regarded do not claim a larger share of spoils [57]. One explanation for this rather unusual practice of withholding material incentives from the prestigious may stem from the ecological condition of hunting and gathering, which is typified by substantial unpredictability in food supply (e.g. lack of food storage, variability in hunting yields). These extremely variable circumstances may favor the emergence of exceptionally strong egalitarian impulses that curb even prestige-based differentials. Robust mechanisms for leveling wealth (including preventing greater entitlement in the prestigious) therefore provide a means of buffering food scarcity and variability, and may represent a necessary subsistence strategy under highly variable environments [96].

There are also other occasions that appear to favor some degree of constraint over prestige differentiation. When a prestigious individual's recognition is deemed undeserved [51,74,97] or when success does not directly translate into benefits for others, prestige can attract envy, jealousy, scrutiny, and sometimes even hostility [98]. These anti-prestige sentiments appear to be most prevalent among the lowest ranking (i.e. least prestigious) individuals in a community and in collectivistic societies that emphasize social cohesion and group success over individual achievement [99–101].

Nevertheless, leveling efforts in the two hierarchies differ in character. While subordinates form anti-dominant coalitions to curtail or suppress the ability of the would-be dominants to exercise coercive power, any leveling in the context of prestige hierarchies is principally focused on economic leveling, protecting subordinates from excessive material stratification, and preventing any 'cheating' of the prestige system. These efforts do not entail leveling differential genuine success or limiting prestige itself.

Summary

How humans and other social species form social hierarchies is a question that has long been of interest to scientists across diverse fields from evolutionary biology to psychological sciences [1]. There is now considerable evidence that unlike in other social mammals where social stratification is principally based on *dominance* (coercive capacity that derives from strength, threat, and intimidation), humans possess a distinctive pathway to social rank termed *prestige* (persuasive capacity that derives from valued skills, abilities, and knowledge) [8•,21•]. This does not mean that both forms of rank are equally stable temporally and contextually. Although intimidation begets compliance, rarely does the power of purely dominant alphas endure without contest [61•]. In many social primates, including humans, commonplace are anti-dominance instincts that can escalate into large-scale coordinated efforts to level the disproportionate power of coercive aggrandizers [63]. By sharp contrast, however, resistance is generally absent towards prestigious individuals, whose greater persuasive influence is recognized and endorsed, likely resulting from the mutually beneficial outcomes they generate with followers [8•]. This relatively greater tolerance for stratification based on prestige (in spite of our strong egalitarian impulses), and the pervasive distaste towards coercive dominance, pose key puzzles that await future research.

Conflict of interest statement

Nothing declared.

References and recommended reading

Papers of particular interest, published within the period of review, have been highlighted as:

- • of special interest

1. Bernstein IS: **Dominance: the baby and the bathwater**. *Behav Brain Sci* 1981, **4**:419-429 http://dx.doi.org/10.1017/S0140525X00009614.

2. Hinde RA: *Biological Bases of Human Social Behaviour*. New York, NY: McGraw-Hill; 1974.

3. Bernstein IS: **Stability of the status hierarchy in a pigtail monkey group (Macaca nemestrina)**. *Anim Behav* 1969, **17**:452-458 http://dx.doi.org/10.1016/0003-3472(69)90146-8.

4. Ang TZ, Andrea M: **Aggression, segregation and stability in a dominance hierarchy**. *Proc R Soc B Biol Sci* 2010, **277**:1337-1343 http://dx.doi.org/10.1098/rspb.2009.1839.

5. Silk JB: **Practice random acts of aggression and senseless acts of intimidation: the logic of status contests in social groups**. *Evol Anthropol Issues News Rev* 2002, **11**:221-225 http://dx.doi.org/10.1002/evan.10038.

6. Weisfeld GE, Beresford JM: **Erectness of posture as an indicator of dominance or success in humans**. *Motiv Emot* 1982, **6**:113-131 http://dx.doi.org/10.1007/BF00992459.

7. Henrich J: *The Secret of Our Success: How Culture Is Driving Human Evolution, Domesticating Our Species, and Making Us Smarter*. Princeton, NJ: Princeton University Press; 2016.

8. • Henrich J, Gil-White FJ: **The evolution of prestige: freely conferred deference as a mechanism for enhancing the benefits of cultural transmission**. *Evol Hum Behav* 2001, **22**:165-196 http://dx.doi.org/10.1016/S1090-5138(00)00071-4.

A seminal paper that lays the theoretical foundation for the distinction between dominance and prestige forms of rank. Drawing on theoretical work that applies evolutionary thinking to understanding culture and cultural change, it proposes that the heavy reliance on culturally transmitted information in humans has led our species to evolve prestige—a second avenue to social rank that operates alongside dominance. A number of predictions are generated, and evidence reviewed, regarding the ethological displays, patterns of imitation and deference, memory biases, and affective responses that distinguish between dominance and prestige.

9. Boyd R, Richerson PJ: *Culture and the Evolutionary Process*. Chicago, IL: University of Chicago Press; 1985.

10. Boyd R, Richerson PJ, Henrich J: **The cultural niche: why social learning is essential for human adaptation**. *Proc Natl Acad Sci U S A* 2011, **108**:10918-10925 http://dx.doi.org/10.1073/pnas.1100290108.

11. Jiménez ÁV, Mesoudi A: **Prestige-biased social learning: current evidence and outstanding questions**. *Palgrave Commun* 2019, **5**:20 http://dx.doi.org/10.1057/s41599-019-0228-7.

12. • Garfield ZH, Hagen EH. Investigating evolutionary models of leadership among recently settled Ethiopian hunter - gatherers. Leadersh. Q. in press https://doi.org/10.1016/j.leaqua.2019.03.005

This work from anthropology provides empirical support for the evolutionary theory of social rank based on dominance and prestige. Ethnographic field data from the Chabu hunter-gatherers of Southwestern Ethiopia reveal that both dominance and prestige reputations predict gaining leader status in the community. This work supplies rare and important evidence of the two forms of rank in non-WEIRD (Western, Educated, Industrialized, Rich, Democratic) societies. A key implication is that the theorized status psychology may be universals that operate across human populations, even in societies like the Chabu typified by highly egalitarian social norms that promote equality, autonomy, and resistance against coercive control.

13. von Rueden CR: **The roots and fruits of social status in small-scale human societies**. In *The Psychology of Social Status*. Edited by Cheng JT, Tracy JL, Anderson C. New York, NY: Springer New York; 2014:179-200 http://dx.doi.org/10.1007/978-1-4939-0867-7_9.

14. Henrich J, Chudek M, Boyd R: **The Big Man Mechanism: how prestige fosters cooperation and creates prosocial leaders**. *Philos Trans Biol Sci* 2015, **370** http://dx.doi.org/10.1098/rstb.2015.0013 20150013.

15. Garfield ZH, Hubbard RL, Hagen EH: **Evolutionary models of leadership**. *Hum Nat* 2019, **30**:23-58 http://dx.doi.org/10.1007/s12110-019-09338-4.

16. Glowacki L, von Rueden CR: **Leadership solves collective action problems in small-scale societies**. *Philos Trans Biol Sci* 2015, **370** http://dx.doi.org/10.1098/rstb.2015.0010 20150010.

17. Price ME, van Vugt M: **The evolution of leader–follower reciprocity: the theory of service-for-prestige**. *Front Hum Neurosci* 2014, **8** http://dx.doi.org/10.3389/fnhum.2014.00363.

18. Chance MRA: **Attention structure as the basis of primate rank orders**. *Man* 1967, **2**:503-518 http://dx.doi.org/10.2307/2799336.

19. de Waal F: *Chimpanzee Politics: Power and Sex Among Apes*. Baltimore, MD: Johns Hopkins University Press; 1982.

20. Gilbert P: *Depression: the Evolution of Powerlessness*. Hillsdale, NJ: Erlbaum; 1992 http://dx.doi.org/10.4324/9781315564319.

21. • Cheng JT, Tracy JL, Foulsham T, Kingstone A, Henrich J: **Two ways to the top: evidence that dominance and prestige are distinct yet viable avenues to social rank and influence**. *J Pers Soc Psychol* 2013, **104**:103-125 http://dx.doi.org/10.1037/a0030398.

This paper provides the first comprehensive empirical test of the evolutionary theory of human social hierarchy that highlights dominance and prestige as distinct strategies for gaining rank. It shows that the two forms of rank can coexist and influence group decision-making and attention. These findings challenge the prior assumption that people make rational assessments and confer rank only based on skill and contribution. This evidence shows that, contrary to this view, people may begrudgingly comply with force.

22. Gilbert P, Basran J: **The evolution of prosocial and antisocial competitive behavior and the emergence of prosocial and antisocial leadership styles**. *Front Psychol* 2019, **10** http://dx.doi.org/10.3389/fpsyg.2019.00610.

23. Maner JK: **Dominance and prestige: a tale of two hierarchies**. *Curr Dir Psychol Sci* 2017, **26**:526-531 http://dx.doi.org/10.1177/0963721417714323.

24. Henrich J, Broesch J: **On the nature of cultural transmission networks: evidence from Fijian villages for adaptive learning biases**. *Philos Trans R Soc Lon B Biol Sci* 2011, **366**:1139-1148 http://dx.doi.org/10.1098/rstb.2010.0323.

25. Henrich J, Henrich N: **The evolution of cultural adaptations: Fijian food taboos protect against dangerous marine toxins**. *Proc R Soc B Biol Sci* 2010, **277**:3715-3724 http://dx.doi.org/10.1098/rspb.2010.1191.

26. Reyes-Garcia V, Molina JL, Broesch J, Calvet L, Huanca T, Saus J, Tanner S, Leonard WR, McDade TW: **Do the aged and knowledgeable men enjoy more prestige? A test of predictions from the prestige-bias model of cultural transmission**. *Evol. Hum. Behav.* 2008, **29**:275-281 http://dx.doi.org/10.1016/j.evolhumbehav.2008.02.002.

27. Stibbard-Hawkes DNE, Attenborough RD, Marlowe FW: **A noisy signal: to what extent are Hadza hunting reputations predictive of actual hunting skills?** *Evol Hum Behav* 2018, **39**:639-651 http://dx.doi.org/10.1016/j.evolhumbehav.2018.06.005.

28. von Rueden CR, Gurven M, Kaplan H: **The multiple dimensions of male social status in an Amazonian society**. *Evol Hum Behav* 2008, **29**:402-415 http://dx.doi.org/10.1016/j.evolhumbehav.2008.05.001.

29. de Waal-Andrews W, Gregg AP, Lammers J: **When status is grabbed and when status is granted: getting ahead in dominance and prestige hierarchies**. *Br J Soc Psychol* 2015, **54**:445-464 http://dx.doi.org/10.1111/bjso.12093.

30. von Rueden CR, Redhead D, O'Gorman R, Kaplan H, Gurven M: **The dynamics of men's cooperation and social status in a small-scale society**. *Proc R Soc B Biol Sci* 2019, **286** http://dx.doi.org/10.1098/rspb.2019.1367 20191367.

31. Weidman AC, Cheng JT, Tracy JL: **The psychological structure of humility**. *J Pers Soc Psychol* 2018, **114**:153-178 http://dx.doi.org/10.1037/pspp0000112.

32. Willer R: **Groups reward individual sacrifice: the status solution to the collective action problem**. *Am Sociol Rev* 2009, **74**:23-43 http://dx.doi.org/10.1177/000312240907400102.

33. Barclay P, Willer R: **Partner choice creates competitive altruism in humans**. *Proc R Soc B Biol Sci* 2007, **274**:749-753 http://dx.doi.org/10.1098/rspb.2006.0209.

34. Hardy CL, van Vugt M: **Nice guys finish first: the competitive altruism hypothesis**. *Pers Soc Psychol Bull* 2006, **32**:1402-1413 http://dx.doi.org/10.1177/0146167206291006.

35. Case CR, Maner JK: **Divide and conquer: when and why leaders undermine the cohesive fabric of their group**. *J Pers Soc Psychol* 2014, **107**:1033-1050 http://dx.doi.org/10.1037/a0038201.

36. Cheng JT, Tracy JL, Henrich J: **Pride, personality, and the evolutionary foundations of human social status**. *Evol Hum Behav* 2010, **31**:334-347 http://dx.doi.org/10.1016/j.evolhumbehav.2010.02.004.

37. Maner JK, Mead NL: **The essential tension between leadership and power: when leaders sacrifice group goals for the sake of self-interest**. *J Pers Soc Psychol* 2010, **99**:482-497 http://dx.doi.org/10.1037/a0018559.

38. Mead NL, Maner JK: **On keeping your enemies close: powerful leaders seek proximity to ingroup power threats**. *J Pers Soc Psychol* 2012, **102**:576-591 http://dx.doi.org/10.1037/a0025755.

39. Price ME, Sheehy-Skeffington J, Sidnaius J, Pound N: **Is sociopolitical egalitarianism related to bodily and facial formidability in men?** *Evol Hum Behav* 2017, **38**:626-634 http://dx.doi.org/10.1016/j.evolhumbehav.2017.04.001.

40. Stulp G, Buunk AP, Verhulst S, Pollet TV: **Human height is positively related to interpersonal dominance in dyadic interactions**. *PLoS One* 2015, **10**:e0117860 http://dx.doi.org/10.1371/journal.pone.0117860.

41. Cabral JCC, de Almeida RMM: **Effects of anger on dominance-seeking and aggressive behaviors**. *Evol Hum Behav* 2019, **40**:23-33 http://dx.doi.org/10.1016/j.evolhumbehav.2018.07.006.

42. Cheng JT, Tracy JL, Ho S, Henrich J: **Listen, follow me: dynamic vocal signals of dominance predict emergent social rank in humans**. *J Exp Psychol Gen* 2016, **145**:536-547 http://dx.doi.org/10.1037/xge0000166).

43. Mileva VR, Cowan ML, Cobey KD, Knowles KK, Little AC: **In the face of dominance: self-perceived and other-perceived dominance are positively associated with facial-width-to-height ratio in men**. *Personal Individ Differ* 2014, **69**:115-118 http://dx.doi.org/10.1016/j.paid.2014.05.019.

44. Sell A, Tooby J, Cosmides L: **Formidability and the logic of human anger**. *Proc Natl Acad Sci U S A* 2009, **106**:15073-15078 http://dx.doi.org/10.1073/pnas.0904312106.

45. Terrizzi BF, Brey E, Shutts K, Beier JS: **Children's developing judgments about the physical manifestations of power**. *Dev Psychol* 2019, **55**:793-808 http://dx.doi.org/10.1037/dev0000657.

46. Witkower Z, Tracy JL, Cheng JT, Henrich J: **Two signals of social rank: prestige and dominance are associated with distinct nonverbal displays**. *J Pers Soc Psychol* 2019 http://dx.doi.org/10.1037/pspi0000181).

47. Krackle WH: *Force and Persuasion: Leadership in an Amazonian Society*. Chicago, IL: University of Chicago Press; 1978.

48. Algoe SB, Haidt J: **Witnessing excellence in action: the 'other-praising' emotions of elevation, gratitude, and admiration**. *J Posit Psychol* 2009, **4**:105-127 http://dx.doi.org/10.1080/17439760802650519.

49. Brand CO, Mesoudi A: **Prestige and dominance-based hierarchies exist in naturally occurring human groups, but are unrelated to task-specific knowledge**. *R Soc Open Sci* 2019, **6**:181621 http://dx.doi.org/10.1098/rsos.181621.

50. Chudek M, Heller S, Birch S, Henrich J: **Prestige-biased cultural learning: bystander's differential attention to potential models influences children's learning**. *Evol Hum Behav* 2012, **33**:46-56 http://dx.doi.org/10.1016/j.evolhumbehav.2011.05.005.

51. Offord M, Gill R, Kendal J: **The effects of prestige on collective performance and information flow in a strictly hierarchical institution**. *Palgrave Commun* 2019, **5**:1-11 http://dx.doi.org/10.1057/s41599-018-0211-8.

52. Over H, Carpenter M: **Children infer affiliative and status relations from watching others imitate**. *Dev Sci* 2015, **18**:917-925 http://dx.doi.org/10.1111/desc.12275.

53. Werner D: **Are some people more equal than others? Status inequality among the Mekranoti Indians of Central Brazil**. *J Anthropol Res* 1981, **37**:360-373 http://dx.doi.org/10.1086/jar.37.4.3629833.

54. Maybury-Lewis D: *Akwe-Shavante Society*. New York, NY: Oxford University Press; 1974.

55. Kakkar H, Sivanathan N, Gobel M: **Fall from grace: the role of dominance and prestige in the punishment of high-status actors**. *Acad Manage J* 2019 http://dx.doi.org/10.5465/amj.2017.0729.

56. Terburg D, Hooiveld N, Aarts H, Kenemans JL, van Honk J: **Eye tracking unconscious face-to-face confrontations: dominance motives prolong gaze to masked angry faces**. *Psychol Sci* 2011, **22**:314-319 http://dx.doi.org/10.1177/0956797611398492.

57. von Rueden CR, Gurven M, Kaplan H, Stieglitz J: **Leadership in an egalitarian society**. *Hum Nat* 2014, **25**:538-566 http://dx.doi.org/10.1007/s12110-014-9213-4.

58. von Rueden CR, Jaeggi AV: **Men's status and reproductive success in 33 nonindustrial societies: effects of subsistence, marriage system, and reproductive strategy**. *Proc Natl Acad Sci U S A* 2016 http://dx.doi.org/10.1073/pnas.1606800113. 201606800.

59. Snyder JK, Kirkpatrick LA, Barrett HC: **The dominance dilemma: do women really prefer dominant mates?** *Pers. Relatsh.* 2008, **15**:425-444 http://dx.doi.org/10.1111/j.1475-6811.2008.00208.x.

60. von Rueden CR, Gurven M, Kaplan H: **Why do men seek status? Fitness payoffs to dominance and prestige**. *Proc R Soc B Biol Sci* 2011, **278**:2223-2232 http://dx.doi.org/10.1098/rspb.2010.2145.

61. • Redhead D, Cheng JT, Driver C, Foulsham T, O'Gorman R: **On the dynamics of social hierarchy: a longitudinal investigation of the rise and fall of prestige, dominance, and social rank in naturalistic task groups**. *Evol Hum Behav* 2019, **40**:222-234 http://dx.doi.org/10.1016/j.evolhumbehav.2018.12.001.
This paper shows that prestige offers a temporally stable means to status, whereas dominance represents a more volatile pathway. It reveals that, among project teams, dominant individuals gained substantial influence over collective decisions during the initial negotiation of rank when groups first formed. However, their differential impact declined sharply and even ceased by the fourth week mark. In sharp contrast, the influence of prestigious individuals augmented (rather than diminished). These results suggest that the effectiveness of dominance-based tactics may vary across time and context, and thus contribute to an understanding of key principles of effective rank acquisition and leadership.

62. Pandit SA, van Schaik CP: **A model for leveling coalitions among primate males: toward a theory of egalitarianism**. *Behav Ecol Sociobiol* 2003, **55**:161-168 http://dx.doi.org/10.1007/s00265-003-0692-2.

63. Boehm C: **Egalitarian behavior and reverse dominance hierarchy**. *Curr Anthropol* 1993, **34**:227-254 http://dx.doi.org/10.1086/204166.

64. • Boehm C: *Hierarchy in the Forest: the Evolution of Egalitarian Behavior*. Cambridge, MA: Harvard University Press; 1999.
This classic work contrasts the political arrangements of human and non-human primates. According to this analysis, it proposes that the egalitarianism of human societies is predominantly the result of coordinated counter-dominance efforts among the weak to suppress the power of coercive despots.

65. Gintis H, van Schaik C, Boehm C: **Zoon Politikon: the evolutionary origins of human political systems**. *Curr Anthropol* 2015, **56**:327-353 http://dx.doi.org/10.1086/681217.

66. Cant MA, English S, Reeve HK, Field J: **Escalated conflict in a social hierarchy**. *Proc R Soc Lond B Biol Sci* 2006, **273**:2977-2984 http://dx.doi.org/10.1098/rspb.2006.3669.

67. Boehm C: **Ancestral hierarchy and conflict**. *Science* 2012, **336**:844-847 http://dx.doi.org/10.1126/science.1219961.

68. Doreian P: **Leveling coalitions as network phenomena**. *Soc Netw* 1982, **4**:27-45 http://dx.doi.org/10.1016/0378-8733(82)90012-0.

69. Bowles S: **Warriors, levelers, and the role of conflict in human social evolution**. *Science* 2012, **336**:876-879 http://dx.doi.org/10.1126/science.1217336.

70. Pun A, Birch SAJ, Baron AS: **Infants use relative numerical group size to infer social dominance**. *Proc Natl Acad Sci U S A* 2016, **113**:2376-2381 http://dx.doi.org/10.1073/pnas.1514879113.

71. Erdal D, Whiten A: **On human egalitarianism: an evolutionary product of Machiavellian status escalation?** *Curr Anthropol* 1994, **35**:175-183 http://dx.doi.org/10.1086/204255.

72. Gavrilets S: **On the evolutionary origins of the egalitarian syndrome**. *Proc Natl Acad Sci U S A* 2012, **109**:14069-14074 http://dx.doi.org/10.1073/pnas.1201718109.

73. Richerson PJ, Boyd R: **Complex societies: the evolutionary origins of a crude superorganism**. *Hum Nat* 1999, **10**:253-289 http://dx.doi.org/10.1007/s12110-999-1004-y.

74. Anderson C, Ames DR, Gosling SD: **Punishing hubris: the perils of overestimating one's status in a group**. *Pers Soc Psychol Bull* 2008, **34**:90-101 http://dx.doi.org/10.1177/0146167207307489.

75. Gardner PM: **Foragers' pursuit of individual autonomy**. *Curr Anthropol* 1991, **32**:543-572 http://dx.doi.org/10.1086/203999.

76. Lee RB: **Eating Christmas in the Kalahari**. *Nat Hist* 1969, **78**:60-63.

77. Tracy JL: *Take Pride: Why the Deadliest Sin Holds the Secret to Human Success*. Boston, MA: Houghton Mifflin Harcourt; 2016.

78. Hamlin JK: **Social behavior: bonobos are nice but prefer mean guys**. *Curr Biol* 2018, **28**:R164-R166 http://dx.doi.org/10.1016/j.cub.2017.12.054.

79. Hamlin JK, Wynn K, Bloom P: **Three-month-olds show a negativity bias in their social evaluations**. *Dev Sci* 2010, **13**:923-929 http://dx.doi.org/10.1111/j.1467-7687.2010.00951.x.

80. Kajanus A, Afshordi N, Warneken F: **Children's understanding of dominance and prestige in China and the UK**. *Evol Hum Behav* 2019 http://dx.doi.org/10.1016/j.evolhumbehav.2019.08.002.

81. Margoni F, Baillargeon R, Surian L: **Infants distinguish between leaders and bullies**. *Proc Natl Acad Sci U S A* 2018, **115**:E8835-E8843 http://dx.doi.org/10.1073/pnas.1801677115.

82. Stavans M, Baillargeon R: **Infants expect leaders to right wrongs**. *Proc Natl Acad Sci U S A* 2019, **116**:16292-16301 http://dx.doi.org/10.1073/pnas.1820091116.

83. Thomas AJ, Thomsen L, Lukowski AF, Abramyan M, Sarnecka BW: **Toddlers prefer those who win but not when they win by force**. *Nat Hum Behav* 2018, **2**:662 http://dx.doi.org/10.1038/s41562-018-0415-3.

84. Thomsen L: **The developmental origins of social hierarchy: how infants and young children mentally represent and respond to power and status**. *Curr Opin Psychol* 2020 http://dx.doi.org/10.1016/j.copsyc.2019.07.044.

85. Barclay P: **Biological markets and the effects of partner choice on cooperation and friendship**. *Curr Opin Psychol* 2016, **7**:33-38 http://dx.doi.org/10.1016/j.copsyc.2015.07.012.

86. Hauser OP, Hilbe C, Chatterjee K, Nowak MA: **Social dilemmas among unequals**. *Nature* 2019, **572**:524-527 http://dx.doi.org/10.1038/s41586-019-1488-5.

87. Over H, Carpenter M, Spears R, Gattis M: **Children selectively trust individuals who have imitated them**. *Soc Dev* 2013, **22**:215-224 http://dx.doi.org/10.1111/sode.12020.

88. Fehr E, Schmidt KM: **A theory of fairness, competition, and cooperation**. *Q J Econ* 1999, **114**:817-868 http://dx.doi.org/10.1162/003355399556151.

89. Skurka C, Winett LB, Jarman-Miller H, Niederdeppe J: **All things being equal: distinguishing proportionality and equity in moral reasoning**. *Soc Psychol Personal Sci* 2019 http://dx.doi.org/10.1177/1948550619862261. 1948550619862261.

90. Almås I, Cappelen AW, Sørensen EØ, Tungodden B: **Fairness and the development of inequality acceptance**. *Science* 2010, **328**:1176-1178 http://dx.doi.org/10.1126/science.1187300.

91. Norton MI, Ariely D: **Building a better America—one wealth quintile at a time**. *Perspect Psychol Sci* 2011, **6**:9-12 http://dx.doi.org/10.1177/1745691610393524.

92. Starmans C, Sheskin M, Bloom P: **Why people prefer unequal societies**. *Nat Hum Behav* 2017, **1** http://dx.doi.org/10.1038/s41562-017-0082 0082.

93. Baldassarri D, Grossman G: **Centralized sanctioning and legitimate authority promote cooperation in humans**. *Proc Natl Acad Sci U S A* 2011, **108**:11023-11027 http://dx.doi.org/10.1073/pnas.1105456108.

94. von Rueden CR: **Making and unmaking egalitarianism in small-scale human societies**. *Curr Opin Psychol* 2020, **33**:167-171 http://dx.doi.org/10.1016/j.copsyc.2019.07.037.

95. Bird R: **Cooperation and conflict: the behavioral ecology of the sexual division of labor**. *Evol Anthropol Issues News Rev* 1999, **8**:65-75 (doi:10.1002/(SICI)1520-6505(1999)8:2<65::AID-EVAN5>3.0.CO;2-3).

96. Cashdan EA: **Egalitarianism among hunters and gatherers**. *Am Anthropol* 1980, **82**:116-120 http://dx.doi.org/10.1525/aa.1980.82.1.02a00100.

97. Anderson C, Srivastava S, Beer JS, Spataro SE, Chatman JA: **Knowing your place: self-perceptions of status in face-to-face groups**. *J Pers Soc Psychol* 2006, **91**:1094-1110 http://dx.doi.org/10.1037/0022-3514.91.6.1094.

98. Feather NT: **Attitudes toward high achievers and reactions to their fall: theory and research concerning tall poppies**. In *Advances in Experimental Social Psychology*. Edited by Zanna MP. San Diego, CA: Academic Press; 1994:1-73 http://dx.doi.org/10.1016/S0065-2601(08)60151-3.

99. Feather NT, McKee IR: **Global self-esteem and attitudes toward the high achiever for Australian and Japanese students**. *Soc Psychol Q* 1993, **56**:65-76 http://dx.doi.org/10.2307/2786646.

100. Paccagnella M, Grove JR: **Attitudes towards high achievers in sport: an adaptation of Feather's tall poppy scale**. *J Sci Med Sport* 2001, **4**:310-323 http://dx.doi.org/10.1016/S1440-2440(01)80040-2.

101. Peeters B: **Tall poppies and egalitarianism in Australian discourse: from key word to cultural value**. *Engl World-Wide* 2004, **25**:1-25 http://dx.doi.org/10.1075/eww.25.1.02pee.