Running Head: DOMINANCE, PRESTIGE, SOCIAL STATUS

Two Ways to the Top:

Evidence that Dominance and Prestige are Distinct yet Viable Avenues to Social Status

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Abstract

The pursuit of social status is a recurrent and pervasive challenge faced by people in all human societies. Yet, the precise means through which individuals compete for status remains unclear. In two studies, we investigated the impact of two fundamental strategies—*Dominance* (the use of force and intimidation to induce fear) and *Prestige* (the sharing of expertise or know-how to gain respect)—on the attainment of social status, which we conceptualized as the acquisition of (a) perceived status (Study 1), (b) influence over others (Study 1), and (c) others' visual attention (Study 2). Study 1 examined the process of hierarchy formation among a group of previously unacquainted individuals, who provided round-robin judgments of each other after completing a group task. Results indicated that the adoption of either a Dominance or Prestige strategy promoted judgments of high-status by group members and outside observers, and higher levels of social influence, based on a behavioral measure. In Study 2, a new sample of participants viewed brief video clips of Study 1's group interactions while their gaze was monitored with an eye-tracker device; these participants' subsequent status judgments coincided with those of participants from Study 1, and both Dominant and Prestigious targets received greater visual attention than low-status targets. Together, these findings demonstrate that Dominance and Prestige are distinct yet both viable status-obtaining strategies, consistent with evolutionary theory.

Keywords: dominance, prestige, social status, social influence, social hierarchy

From 1945 to 1980, Henry Ford II—grandson of Henry Ford, founder of Ford Motor Company—built Ford into the second largest industrial corporation worldwide, amidst a turbulent post World War II economy. Ford II attained his success, in part, by developing a reputation for erratic outbursts of temper and unleashing humiliation and punishment at will upon his employees, who described him as a terrorizing dictator, bigot, and hypocrite. When challenged or questioned by subordinates, Ford II would famously remind those who dared contradict him, "*My* name is on the building". Yet, despite being widely regarded as one of the most intimidating and autocratic CEOs to ever grace the company, Ford II was an enormously successful leader, and he has been credited with reviving the Ford business legend during a period of turmoil and crisis (Iacocca, 1984).

A contrasting example of effective leadership can be seen in the case of Warren Buffett, chairman and CEO of Berkshire Hathaway, who was ranked the world's third wealthiest person in 2010. Unlike Ford II, Buffett ran his company by developing a reputation for subtly steering rather than controlling every decision-making process. His autonomy-generating approach to leadership is said to instill confidence and boost performance among his executives, whom Buffett describes as brilliant coworkers he trusts and respects. Buffett thus exemplifies a style of leadership quite opposite to that of Ford II, yet both individuals reached what can only be considered the highest level of social status possible in any industry. This raises the question: are there multiple ways of attaining social status and influence in human societies?

The Nature of Social Status

Status differences are universal in social animals (Brown, 1991; Mazur, 1985; Murdock, 1949). In all human societies, status differences among individuals influence patterns of conflict, resource allocation, and mating, and often facilitate coordination on group tasks (Báles, 1950;

Berger, Rosenholtz, & Zelditch, 1980; Ellis, 1995; Fried, 1967). Even the most egalitarian of foragers reveal such status differences, despite the frequent presence of social norms that partially suppress them (Boehm, 1993; Lee, 1979; Lewis, 1974; see Henrich & Gil-White 2001). High-status individuals tend to have disproportionate influence, such that social status can be defined as the degree of influence one possesses over resource allocation, conflicts, and group decisions (Berger et al., 1980). In contrast, low-status individuals must give up these benefits, deferring to higher status group members. As a result, higher status tends to promote greater fitness than low-status, and a large body of evidence attests to a strong relation between social rank and fitness or well-being, across species (e.g., Barkow, 1975; Betzig, 1986; Cowlishaw & Dunbar, 1991; Hill, 1984; Hill & Hurtado, 1989; von Rueden, Gurven, & Kaplan, in press).

Despite its ubiquity, the process of status differentiation in humans is not well understood. In the face of a growing body of research, it remains unclear precisely how individuals attain status and successfully compete for social standing. At least two major accounts of status attainment currently prevail in the literature, but they are directly at odds with each other, resulting in an ongoing debate within the field (Anderson, Srivastava, Beer, & Spataro, 2006). On one hand, a number of theorists have argued that status acquisition relies on the attainment and demonstration of superior skills and abilities, as well as altruistic tendencies, arguing that "individuals do not attain status by bullying and intimidating… but by behaving in ways that suggest high levels of competence, generosity, and commitment" (Anderson & Kilduff, 2009a, p. 295; also see Berger, Cohen, & Zelditch, 1972; Hollander & Julian, 1969). In contrast, others argue that individuals can effectively ascend a group's status hierarchy by using manipulative and coercive tactics such as intimidation and "aggression… [which] function to increase one's status or power" (Buss & Duntley, 2006; p. 267), and that the human status system is at least

partially "based… on overt threats and physical attack" (Mazur, 1973, p. 526; also see Chagnon, 1983; Griskevicius, Tybur, Gangestad, Perea, Shapiro, & Kenrick, 2009; Hill & Hurtado, 1996). These incompatible perspectives beg some resolution. Here, we argue that in contrast to both of these opposing perspectives, neither intimidation nor competence is the exclusive means of status acquisition in humans. Instead, both of these two distinct processes may operate concurrently within social groups, such that individuals can pursue either path to successfully climb the hierarchy (Cheng, Tracy, & Henrich, 2010; Henrich & Gil-White, 2001). We tested this novel account of status attainment by examining whether individuals who adopt these distinct behavioral pathways emerge as high status members of their social group, regardless of which path they choose.

Perspectives on Status Attainment

The Social-Functionalist Account

Most accounts of social hierarchies take a social-functionalist perspective (e.g., Berger etal., 1972; Blau, 1964; Hollander & Julian, 1969; Thibaut & Kelley, 1959), in which an individual's status is considered to be a function of the group's collective consensus on where the individual ranks in the hierarchy based on social worth. In other words, status is conferred, by the group, upon individuals perceived to possess superior expertise and competence in valued domains (Berger et al., 1972). This system of expertise-based status allocation is thought to serve a number of social functions, such as increasing perceptions that the hierarchy is legitimate and fair, which minimizes conflict, and allowing the group to maximize contributions from its most competent members and best achieve shared goals.

The social-functionalist perspective on status attainment has garnered considerable empirical support. For example, numerous studies have demonstrated that the characteristics

valued and prioritized in leaders—intelligence, competence, group commitment, and prosociality—consistently predict high status, defined in terms of perceived influence and leadership, as well as more objective influence over group decisions (Báles, Strodtbeck, Mills, & Roseborough, 1951; Coie, Dodge, & Coppotelli, 1982; Driskell, Olmstead, & Salas, 1993; Lord, De Vader, & Alliger, 1986; Strodtbeck, 1951; Willer, 2009; for a review, see Anderson & Kilduff, 2009a). More specifically, studies have found that status is granted to individuals who make high-quality comments (Gintner & Lindskold, 1975; Sorrentino & Boutillier, 1975), are perceived as experts (Bottger, 1984; Littlepage, Schmidt, Whisler, & Frost, 1995; Ridgeway, 1987), and make large contributions to a public fund (Willer, 2009). In fact, Anderson and Kilduff (2009b) found that in task-focused groups, perceptions of competence were the most important factor contributing to social influence.

The Social-Dominance Account

Central to the social-functionalist account is the notion that status cannot be attained through coercive tactics such as bullying or intimidation, but instead derives only from one's apparent value to the group (Anderson & Kilduff, 2009a; Ridgeway, 1987; Ridgeway & Diekema, 1989). One of the strongest proponents of this account is Barkow (1975), who argues that status relationships based purely on threat of force are untenable in human societies. However, the other major extant account of status attainment in the social science literature, the social-dominance account, opposes this view. According to the social-dominance account, dominance contests (i.e., ritualized agonistic challenges, threats, or attacks resulting in the submission of one party to another) and coercion function as fundamental systems of status allocation in human societies (Buss & Duntley, 2006; Chagnon, 1983; Griskevicius et al., 2009; Hill & Hurtado, 1996; Kyl-Heku & Buss, 1996; Lee & Ofshe, 1981; Mazur, 1973). In this view,

144 status (i.e., social influence) is allocated to individuals who show a dominant, authoritative
145 demeanor, and not, as the social-functionalist perspective suggests, on the basis of rational
146 calculation about others' abilities or expertise.

147 Consistent with this account, a number of studies indicate that status may be associated
148 with intimidation and threat; high-status (i.e., perceived influence and leadership, and actual
149 resource control) has been found to positively correlate with coercive behavior, toughness, and
150 various forms of aggression (Cashdan, 1998; Hawley, 2002). Results of a meta-analysis found
151 that the personality trait of dominance—defined as a propensity towards forceful, assertive, and
152 aggressive behaviors—explains a substantial proportion of variance in perceptions of leadership,
153 even more so than intelligence (Lord et al., 1986). Furthermore, when asked to nominate
154 strategies typically used for negotiating status hierarchies, individuals report aggression, coercion,
155 derogation, social exclusion, and manipulation as frequently used tactics, along with tactics
156 consistent with the social-functionalist perspective, such as displaying knowledge, working hard,
157 and helping others (Buss, Gomes, Higgins, & Lauterbach, 1987; Kyl-Heku & Buss, 1996),
158 suggesting that lay-people conceptually associate both sets of strategies with status acquisition.
159 More broadly, there is evidence that the motivation to seek status promotes aggressive behaviors
160 (though this research did not examine the effectiveness of these behaviors). Approximately 48%
161 of men and 45% of women identify status concerns as the primary reason for their last act of
162 aggression, and the experimental induction of status motives increases aggressive tendencies in
163 both men and women (Griskevicius et al., 2009). While it remains unclear whether social-
164 dominance is an effective route to status attainment, these findings are suggestive, and cannot be
165 reconciled with the social-functionalist account.
166

The Dominance-Prestige Account

More recently, Henrich and Gil-White (2001) developed an alternative evolutionary model that takes into account both our species' heritage as primates who tend to use coercive dominance, and as cultural beings who rely immensely on cultural learning. By considering the selection pressures that likely favored the emergence of status inequalities, Henrich and Gil-White (2001) proposed that there are two distinct paths to status attainment in human societies: *Dominance* and *Prestige*. In this view, *Dominance* refers to the use of intimidation and coercion to attain a social status that is premised on the induction of fear, similar to the means of status attainment suggested by the social-dominance account. *Prestige*, in contrast, refers to status that is granted to individuals who are recognized and respected for their skills, success, or knowledge (which can be acquired via cultural learning), similar to the social-functionalist account. The major difference between the Dominance-Prestige account and these prior accounts is that it explicitly argues, on the basis of evolutionary logic, that *both* strategies persist in modern humans, both lead to patterns of behavior and tactics that are effective routes to social influence, and both can be effective even within the same social groups.

Dominance is exemplified by contemporary institutional relationships based on coercion, such as that between a boss and employee, or bully and victim. Dominant individuals create fear in subordinates by unpredictably and erratically taking or threatening (implicitly or explicitly) to withhold resources; in turn, subordinates submit by complying with Dominants' demands, in order to safeguard other more valuable resources (e.g., their physical welfare, children, or livelihoods). As a result, Dominants can attain a great deal of social status. Prestige, in contrast, is granted to individuals who are considered worthy of emulation, usually for their skill or success. As a result, the opinions, wishes, and decisions of Prestigious individuals are heeded,

thus conferring them with social influence. The social influence of Prestigious individuals is unique in that subordinates both shift their views and opinions closer to that of the Prestigious (an example of imitation) and heed their wishes out of deference even when they do not agree with them (an example of seeking favor, in order to be granted greater access to these leaders to facilitate copying/learning).

According to the model, Dominance initially arose in evolutionary history as a result of agonistic contests for material resources and mates which were common among non-human species, but continues to exist in contemporary human societies, largely in the form of psychological intimidation, coercion, and wielded control over costs and benefits (e.g., access to resources, mates, and well-being). In both humans and nonhumans, Dominance hierarchies are thought to emerge to help maintain patterns of submission directed from subordinates to Dominants, thereby minimizing agonistic battles and incurred costs. In contrast, Prestige is likely unique to humans, because it is thought to have emerged from selection pressures to preferentially attend to and acquire cultural knowledge from highly skilled or successful individuals, a capacity considered to be less developed in other animals (Boyd & Richerson, 1985; Laland & Bennett, 2009).[1] In this view, social learning (i.e., copying others) evolved in humans as a low-cost, fitness-maximizing information-gathering mechanism (Boyd & Richerson, 1985). Once it became adaptive to copy skilled others, a preference for social models with better-than-average information would have emerged. This would promote competition for access to the highest quality models, and deference toward these models in exchange for copying/learning opportunities. Consequently, selection likely favored Prestige differentiation, with individuals possessing high-quality information or skills elevated to the top of the hierarchy. Meanwhile, other individuals may reach the highest ranks of their group's hierarchy by wielding threat of

force, regardless of the quality of their information or skills. Thus, Dominance and Prestige are thought to be coexisting avenues to social status within the same social groups, despite being underpinned by distinct motivations and behavioral patterns, and resulting in distinct patterns of imitation and deference from subordinates.

Importantly, both Dominance and Prestige are best conceptualized as behavioral strategies deployed in certain situations, which influence relationships, and can be used (with more or less success) by any individual within a group.[2] They are not types of *individuals*, or even, necessarily, traits within individuals. Instead, we assume that all situated dyadic relationships contain differential degrees of both Dominance and Prestige, such that each person is Dominant and Prestigious to some extent, to some other individual. Thus, high levels of Dominance *and* Prestige may be found within the same individual, and may depend on who is doing the judging. For example, by controlling students' access to rewards and punishments, school teachers may exert Dominance in their relationships with some students, but simultaneously enjoy Prestige with others, if they are respected and deferred to for their competence and wisdom. Indeed, previous studies have shown that, based on both self- and peer-ratings, Dominance and Prestige are largely independent (mean r = -.03; Cheng et al., 2010).

Nonetheless, though this account holds that Dominance and Prestige can be effective status-attaining strategies for all individuals in the appropriate contexts, it is also assumed that individuals vary in their preferred strategy. As a result of certain genes and/or adaptive calibrations over the course of ontogeny (i.e., acquired habits), individuals may develop predominantly Prestige- or Dominance-based relationships with many others, resulting in a trait-like use of each strategy, and measurable individual differences in the tendency to perceive oneself, and be perceived by others, as Dominant and/or Prestigious (Cheng et al., 2010). For

example, certain physical or personality characteristics likely provide individuals with greater ease and success at inducing fear or admiration (e.g., physical size, narcissism, aggressiveness, intelligence), and thereby allow certain individuals to derive maximal payoff from the pursuit of Dominance or Prestige, thus leading to relatively stable individual differences in the propensity to use each strategy (see Cheng et al., 2010). Past experiences in wielding coercion versus displaying skills may also play a role in determining whether individuals engage in Dominance rather than Prestige, or vice-versa, or both (Cheng, et al., 2010; Tracy, Shariff, & Cheng, 2010).

Indeed, several recent studies have drawn on the Dominance-Prestige account to measure these two strategies as trait-like dispositions that vary between individuals, and several findings supportive of the Dominance-Prestige account have emerged. First, individuals who tend to use a Dominant strategy across numerous relationships (from here on referred to as individuals high in Dominance, or Dominant individuals) tend to be aggressive, narcissistic, and Machiavellian, whereas those who tend to use a Prestige strategy across relationships (from here on referred to as individuals high in Prestige, or Prestigious individuals) tend to be socially accepted, agreeable, conscientious, and have high self-esteem (Buttermore, 2006; Cheng et al., 2010; Johnson, Burk, & Kirkpatrick, 2007). These findings are based on assessments of Dominance and Prestige using both self- and peer-ratings. Second, Prestigious individuals tend to demonstrate locally valued competencies and skills, such as academic achievement, altruistic behaviors, and athletic, social, intellectual, and advice-giving abilities (in the context of collegiate varsity teams; Cheng et al., 2010); and hunting ability, skill in food production, generosity, number of allies, and nutritional status (in the context of a small-scale Amazonian society; Reyes-Garcia et al., 2008; 2009; von Rueden, Gurven, & Kaplan, 2008). Third, there is evidence for distinct neuroendocrine profiles;

individuals high in Prestige tend to have lower basal Testosterone levels, a hormone linked to aggressive behavior, relative to individuals low in Prestige (Johnson et al., 2007).

In sum, the Dominance-Prestige account provides a way of reconciling the two currently reigning, and opposing, approaches to understanding human status attainment. As a result, this model has several advantages over these prior perspectives. First, although prior models that emphasize the narrow traits and attributes (e.g., aggressiveness, intelligence) predictive of status serve a descriptive function (i.e., providing information about the kinds of individuals who tend to attain status, on average, across many contexts), they do not provide a causal or explanatory account. That is, such models do not address questions of *why* these behaviors effectively promote status. The Dominance-Prestige account, in contrast, uses evolutionary logic to generate *a priori* hypotheses about the processes underlying the attainment of status in humans, such that, when these hypotheses are supported, findings explain (rather than simply describe) why a vast number of narrower attributes and characteristics give rise to status.

Second, the Dominance-Prestige approach emphasizes broad social processes, involving *fear* and *respect*, rather than the narrower stable attributes and traits thought to underlie status in other accounts. Although these narrower characteristics may elicit feelings of fear or respect in others (and by implication, be part of the broader Dominance or Prestige constructs), these links are highly context-specific. For example, an intelligent college professor probably holds little status on a recreational soccer team, where the team's star soccer player exerts greater influence. Intellectual abilities can enhance status in one context, but may be ineffectual in others. Stable traits and characteristics produce admiration and fear in some contexts but not others, so have limited utility in explaining cross-situational patterns of status allocation. Thus, in the present research, we assessed individuals' relationships with group members broadly, using items such

as "I respect and admire him/her," "I seek his/her advice on a variety of matters," and "I'm afraid of him/her" (see Cheng et al., 2010). These items tap more directly into the critical interpersonal perceptions central to Dominance and Prestige processes, in contrast to the narrow, static attributes typically examined in previous studies (e.g., "toughness", intelligence).

However, despite the potential benefits of the Dominance-Prestige account for explaining human patterns of status allocation and resolving prior controversies in the literature, no studies to date have empirically validated the theorized effects of Dominance and Prestige on status attainment. Thus, in the current research, we sought to conduct the first test of whether Dominance and Prestige are alternative avenues to status attainment, such that individuals within the same social group can be reliably identified as demonstrating behaviors and motivations associated with each, and can effectively attain social status using both strategies.

The Present Research

Preliminary Evidence on the Association between Dominance, Prestige, and Social Status

Although no empirical efforts to date have directly examined whether Dominance and Prestige are both associated with increased social status, several studies have documented positive relations between high status and narrower attributes and behaviors that are theoretically related to Dominance or Prestige within the same social groups. For example, Hawley (2002; 2003) found that among children aged 3 to 6, narrow coercive behaviors such as taking away a toy, insulting, or physically aggressing against another child were as likely to promote social power (operationally defined as obtaining control over a desired toy) as were narrow prosocial behaviors such as making suggestions and offering help. Other developmentally oriented studies have found that children who are more frequently imitated, obeyed, and preferred as interaction partners, as well as children who frequently win agonistic encounters, tend to receive the most

looks or glances from their peers (Abramovitch, 1976; Hold, 1976; La Freniere & Charlesworth, 1983; Vaughn & Waters, 1981). Similarly, studies have found that teacher-rated aggressiveness, observed dominant acts, peer liking, and the degree to which a child is imitated are all predictors of the number of glances received from other children (Abramovitch & Grusec, 1978; La Freniere & Charlesworth 1983; but see Vaughn & Waters, 1981). In this literature, others' glances or visual attention is typically operationalized as an indicator of social status.

Though none of these studies assessed Dominance or Prestige as the broad constructs that they are—constituted of a range of distinct behaviors and tendencies—these findings do provide preliminary support for the suggestion that both strategies may effectively garner status within the same social groups. However, several researchers have argued that status dynamics work differently in children's social groups, in that children tolerate the use of force and coercion to obtain social rank but adults do not (Barkow, 1975; Savin-Williams, 1980; but see Strayer & Trudel, 1984). Consistent with this view, Savin-Williams (1979) found that among children and early adolescents (age 9-13), narrow characteristics and behaviors theoretically associated with Dominance (e.g., pubertal maturation, physical fitness, physical and verbal threats, taking or removing objects) were the strongest predictors of status, but among middle to late adolescents (age 14-17), these same variables were unrelated to status (Savin-Williams, 1980). Further supporting the developmental account, Hawley (2002) found that coercive 3-6 year-old children were rated as more likeable by their peers, an effect directly opposed to findings in adults, who typically dislike and reject coercive, arrogant, and aggressive individuals (Cheng et al., 2010). Thus, findings on the early development of status hierarchies suggest that the effectiveness of Dominance-related behaviors and tactics may shift over the lifespan, such that Dominance is effective uniquely in early childhood, but perhaps not in adulthood. It thus remains to be seen

whether Dominance and Prestige are viable status-attainment strategies in adult social groups. According to the Dominance-Prestige account, Dominance hierarchies may emerge in childhood social groups prior to Prestige hierarchies, but this does not mean that one later comes to replace the other.

Testing the Viability of Dominance and Prestige

To sufficiently test the Dominance-Prestige account, several conditions must be met. First, we must measure the distribution of actual influence, as well as group members' perceptions of influence (Buss et al., 1987). Explicit beliefs about which tactics promote influence do not necessarily reflect the actual processes through which influence is obtained. For example, married couples rate an accommodative communication style as a useful tactic to achieve influence, but this style is, in fact, predictive of *less* decision-making power (Kipnis, Castell, Gergen, & Mauch, 1976). Second, we must assess status as it is perceived by uninvolved outside observers, in addition to other group-members. Group members may be motivated to exaggerate (or even construct) *post-hoc* perceptions of leaders' status to rationalize the hierarchy that emerged (Anderson & Kilduff, 2009b; see Jost & Banaji, 1994). To address these issues, we assessed influence in the present research using a behavioral task, and obtained both group-members' ratings of each individual's status and ratings made by outside observers.

Third, we must ensure that Dominance is assessed in terms of actual Dominance—based on group members' reports of fear of a target individual—and not in terms of *attempted* Dominance. In prior work, narrow behaviors associated with Dominance (e.g., dismissive, intrusive, or contemptuous speech, nonverbal behaviors thought to convey Dominance) were found to be ineffective for status attainment when a confederate's dominant behavior was resisted by observers (Ridgeway, 1987; Ridgeway & Diekema, 1989). These studies have been

interpreted to suggest that coercion does not promote status. However, these studies do not provide an adequate test of this question because they involved *failed* attempts at inducing coercion; dominant confederates did not pose any real threat to participants (either because participants resisted them or because the confederate was present only via video-recording). To address this issue, we assessed both Dominance and Prestige on the basis of peer ratings, using previously validated scales which capture the extent to which group members experience fear and admiration toward each target (Cheng et al., 2010).

Fourth, we must examine the concurrent effectiveness of Dominance and Prestige within the same social groups. A number of researchers have argued that the reason some studies found status-attainment effects from coercive behaviors, whereas others found such effects from competence is that the different groups examined hold different values about legitimate bases of status. Thus, it is critical to directly test whether the two strategies are both effective within the same social groups, to examine whether: (a) Dominance is effective in groups other than those that are simply uncooperative and value aggression over competence; (b) Dominance and Prestige are inherently incompatible or antagonistic; and (c) Dominant and Prestigious individuals can both attain high status even when they directly compete against each other. We are aware of no prior studies that meet all of these criteria.

Measurement of Social Status in the Present Research

While definitions of social status vary, two prominent features of status that have been reliably assessed in a range of human societies are social influence (Báles et al., 1951; Berger et al., 1972; French & Raven, 1959; Mazur, 1973; Moore, 1968) and attention paid by other group members (Anderson & Shirako, 2008; Chance, 1967; Fiske, 1993; Hold, 1976; see Anderson, John, Keltner, & Kring, 2001). In the current research, we operationalized status in three ways.

First, we examined each individual's level of social influence, where influence is defined as the ability to modify others' behaviors, thoughts, and feelings (Berger et al., 1980; Cartwright, 1959; Lewin, 1951). Second, we examined the amount of visual attention each individual received from others, under the assumption that high-status individuals receive disproportionately more social attention than low-status individuals (Chance, 1967; Fiske, 1993). Third, we computed a measure of overall perceived status from peers' judgments of the degree to which each individual possesses high status and influence, garners attention, and demonstrates leadership ability. By conceptualizing status as behavioral influence, social attention, and overall perceived status, we can ensure to capture variance in a range of within-group asymmetries that have been identified (e.g., status, power, dominance, prestige, popularity, leadership hierarchies). In addition, this multi-method approach allows us to differentiate the consequences of high-status (i.e., influence over others, heightened attention, perceived status) from the means of its attainment (i.e., use of a Dominance or Prestige strategy), permitting us to test the viability of these potential status-attaining strategies. Other definitions conflate this important distinction; for example, "power" and "intimidation" can each be viewed as both the means and the ends to status attainment, making it difficult to separate cause and effect.

Specifically, in Study 1, we examined whether Dominance and Prestige spontaneously emerge and coexist as viable status-attainment strategies within the same social groups, by asking previously unacquainted individuals to complete a collaborative task and allowing status hierarchies to naturally emerge. Dominance, Prestige, and perceived status were assessed using both within-group peer-ratings and outside observers' ratings, and behavioral influence was assessed by measuring the degree to which each person shaped the group's decision-making. Study 2 examined whether Dominance and Prestige both promote high status within the same

groups using visual attention as the barometer of status. Observer who were unacquainted with participants from Study 1 wore an eye-tracking device while viewing video clips of the Study 1 group interactions, and we assessed the extent to which their gaze tracked targets' Dominance and Prestige, and cohered with their explicit ratings of targets' Dominance and Prestige.

Study 1

Method

Participants and procedure. 191 students at the University of British Columbia (53% male) were randomly assigned to 1 of 36 same-sex groups (50% male), each consisting of 4 to 6 unacquainted individuals (M = 5.31 participants per group). Participants were contacted prior to the study to ensure that all group members were not previously acquainted. They were paid for their participation, with the chance to earn an additional monetary bonus during the study.

Upon arrival, participants were randomly assigned seats at a rectangular table, with a name tag in front of each participant identifying him/her to other group members. Participants were first asked to privately complete the "Lost on the Moon" exercise (Bottger, 1984), which involves rank-ordering 15 items (e.g., oxygen tanks, heating unit, signal flares) in order of their utility for surviving a crash landing on the moon. Next, participants worked collectively as a group for 20 minutes on the same task. They were instructed to use their previously completed private responses to guide the group discussion. To incentivize group involvement, participants were told that the group's final decision would be scored against an answer key, and high scores would earn each group member a $5 bonus. The 20-minute group interaction was video-recorded using two digital video cameras mounted on tripods on either side of the table (each camera captured all participants on one side of the table and no participants on the other side; either 2 or 3 participants sat on each side; see Figure 1). Observation of the video-recorded interactions

revealed that the task was engaging and evoked considerable discussion and disagreement among members.

After completing the group task, participants privately completed a post-task questionnaire in which they provided peer ratings of all group members (see below for measures), in a round-robin design. Finally, the experimenter excused herself to purportedly score the group's submitted response on the group task.

Measures.

Post-task round-robin peer-ratings. Upon completing the group task, group members rated each other on a number of dimensions (listed below), on a scale ranging from 1 ("Not at all") to 7 ("Very much"). We analyzed these ratings using the software program SOREMO (Kenny, 1998), to implement the Social Relations Model (SRM; Kenny & La Voie, 1984). SRM partitions peer-rating scores into perceiver, target, and relationship effects. Here, we were particularly interested in *target effects*, which are, essentially, the average of all group members' ratings of a given target on a given dimension, after removing idiosyncratic perceiver and relationship biases/effects.[3] Also of interest is *target variance*, which captures the amount of variation in peer-ratings due to the target, and was used as an index of extent of consensus among perceivers in their ratings of each target (i.e., a measure of inter-rater reliability). A larger relative target variance (i.e., target variance divided by total variance) indicates that a given target elicited a high level of consensus among group members.

(a) Perceived social status and agency. Participants indicated the extent to which each group member demonstrated high social status during the task by rating each member on three items—"was paid attention", "had high status", and "led the task". All three items showed statistically significant amounts of target variance (relative target variances were 29%, 33%, and

64%,[4] respectively, *p*s < .05),[5] indicating that group members agreed on each other's relative perceived social status at better than chance levels. To further partition relationship variance from error variance, these three status items were subsequently entered as multiple indicators of a latent *perceived social status* construct (inter-item α = .89, relative target variance = 38%).

As an additional index of perceived status, we also assessed perceived agency—a concept involving control, power, and status (Bakan, 1966)—which is expected to show positive associations with the two strategies. Agency was assessed using three peer-rated items: "assertive", "self-confident", and "timid" (reverse-scored; Wiggins, 1979). Statistically significant amounts of target variance were found across these 3 items (relative target variances were 38%, 41%, and 40%, respectively, *p*s < .05), so we aggregated across their target scores to form an overall score for agency (inter-item α = .92, relative target variance = 38%).

(b) Dominance and Prestige. To capture the extent to which each participant adopted a Dominance and Prestige strategy, peers rated the perceived Dominance and Prestige of each group member using the Dominance and Prestige Peer-Rating Scales (Cheng et al., 2010). These previously validated scales include 8 items assessing Dominance (e.g., "desires to control others") and 8 items assessing Prestige (e.g., "is respected and admired by others"; see http://ubc-emotionlab.ca/research/#dompres for full scales; we omitted one item—"Members of your group do not want to be like him/her"—due to its unsuitability for briefly acquainted group members). The amount of target variance in ratings across the 8 Dominance items (ranging from 10% to 36%) and across the 8 Prestige items (ranging from 10% to 35%) were statistically significant, all *p*s < .05, suggesting that group members could reliably report individual differences on both scales. Target scores for the 8 Dominance items, and the 8 Prestige items were combined,

464 respectively, to form overall Dominance (inter-item α = .93, relative target variance = 22%) and
465 Prestige (inter-item α = .89, relative target variance = 15%) scores for each individual.
466 *(c) Liking.* In addition to examining the effects of Dominance and Prestige on status,
467 Study 1 sought to probe the kinds of relationships that Dominant and Prestigious individuals
468 have with followers, by examining whether the two strategies are differentially associated with
469 peer liking. Our evolutionary analysis suggests that Dominance is a form of imposed status
470 predicated on inducing fear through coercive and intimidating behaviors, whereas Prestigious
471 individuals have no authority or power to enforce decisions, but instead signal their kindness,
472 warmth, and social attractiveness to maintain respect and their conferred status. We therefore
473 expect Dominance to be negatively, and Prestige positively, associated with perceived likeability.
474 Importantly, however, we do not expect liking alone to promote status among individuals high in
475 either strategy, given that for the Prestigious power derives from demonstrated skills and
476 expertise, not by gaining others' liking, and for the Dominant power derives from their ability to
477 control access to valuable resources, not from the fact that others dislike them**.** Specifically,
478 likeability was assessed with two items: "I like this person", and "I like working with this
479 person". Statistically significant amounts of target variance were found across these items
480 (relative target variances were 15% and 22%, respectively, *p*s < .05). Consequently, their target
481 scores were combined to form an overall score for likeability (inter-item α = .89, relative target
482 variance = 17%).
483 ***Behavioral measure of social influence.*** We quantified behavioral influence by
484 assessing the degree to which individuals brought the collective group decision on the Lost on
485 the Moon Task closer to their own thoughts and opinions (Cartwright, 1959; Lewin, 1951).
486 Specifically, following Bottger's (1984) approach, we measured the degree of similarity between

each participant's *private* response, completed prior to the group interaction, and the *group's* final public, collective response. For each participant, a behavioral influence score was computed by calculating the absolute difference between his/her private ranking of each Lost on the Moon item and the group's final ranking of that item, then summing across all 15 items and multiplying by -1 (for directionality scaling). This scoring procedure can be represented as:

$$y_{ij} = -1(\sum_{k=1}^{15}|x_{ijk} - x_{jk}|)$$

where y_{ij} is the influence score of subject *i* from group *j*. x_{ijk} is subject *i*'s rating on item *k*. x_{jk} is group *j*'s rating on item *k*. The expression in brackets, which captures the level of discrepancy between individual and group responses, was multiplied by -1 so that higher scores (i.e., negative values closer to 0) would reflect greater social influence (i.e., greater similarity between individual and group responses). The use of this behavioral measure, coupled with peers' ratings of perceived social status, allowed us to circumvent limitations associated with sole reliance on peer-reports of social influence (i.e., findings indicate that such perceptions may be only weakly correlated with actual task influence; Bottger, 1984; March, 1956).

Outside observer global judgments. Two research assistants, blind to the hypotheses and unacquainted with participants, independently watched all video-recorded group interactions. After viewing each session, they judged each participant on the following dimensions:

(a) Perceived social status, Dominance, and Prestige. Judges rated the extent to which each group member was "influential" (inter-rater α = .87), "bossy" (which we used as a measure of Dominance; inter-rater α = .83), and "respected" (which we used as a measure of Prestige; inter-rater α = .70). Ratings were completed on a scale ranging from 1 (*Not at all*) to 5 (*Extremely*).

(b) Agency and liking. Judges rated each participant on the interpersonal grid (Moskowitz & Zuroff, 2005), a single-item instrument developed to measure observer perceptions of agentic interpersonal behaviors in a given target. By placing a single "X" in any square on the grid, judges rated the perceived agency (inter-rater $\alpha = .86$) of each group member. They also rated the extent to which each participant was successful at building friendships and alliances (inter-rater $\alpha = .62$), on a scale ranging from 1 (*Not at all*) to 5 (*Very Much*); this item was used as a measure of the extent to which each target was liked by other group members.

Results and Discussion

Do Dominance and Prestige Both Predict Social Influence?

To test whether Dominance and Prestige both predict social status, we examined correlations between peer-perceived Dominance and Prestige and our three indices of status (see Table 1 for correlations among indices of status). When men and women were analyzed separately, the effect sizes of the association between Dominance and Prestige and the measures of social status were almost identical; there were no significant gender differences. We thus report results based on data collapsed across genders. Both Dominance and Prestige positively predicted social status on all three measures (see Table 2). Thus, individuals who were judged by peers to be Dominant or Prestigious were: (a) perceived by peers as possessing high status and agency, (b) perceived by outsider observers as possessing high status and agency, and (c) exerted more behavioral influence over the decision-making process of the group. It is noteworthy that these correlations are based on measures of status from three different sources: (a) in-lab peers, (b) outside observers, and (c) a behavioral measure; given that only one of these measures overlaps in source with the measures of Dominance and Prestige, it is unlikely that shared method variance artificially inflated effects. Furthermore, as is shown in Table 2, this pattern of

results was largely replicated when we used outside observers' perceptions of participants' Dominance and Prestige instead of in-lab peers'. The only exception was that, with outside-observer judgments, the positive correlation between Dominance and the behavioral measure of influence did not reach conventional levels of significance, $p = .14$.

Are There Group Differences in the Extent to Which Dominance and Prestige Promote Status?

The correlational analyses reported above cannot account for the possible dependencies that may arise from groups (i.e., individuals were nested within groups). As a result, the status-promoting effects of Dominance and Prestige we found may be limited to selected groups, and not uniformly characteristic of all groups sampled. This is unlikely given that groups were formed via random assignment, so group differences can be expected to be minimal; indeed, most research using a small-groups zero-acquaintance paradigm assumes, and has verified, an absence of substantive group differences (e.g., Albright, Kenny, & Malloy, 1988; DePaulo, Kenny, Hoover, Webb, & Oliver, 1987; Kenny & Albright, 1987; Kenny, Horner, Kashy, & Chu, 1992; Malloy & Albright, 1990). Nonetheless, we examined the possibility of between-group differences by modeling for potential group differences using hierarchical linear modeling (HLM; Bryk & Raudenbush, 1992). Individual participants were modeled at Level 1 and groups were modeled at Level 2. The coefficients for Level 1 predictor terms Dominance and Prestige were modeled as random effects, to allow the effects of Dominance and Prestige on status to vary across groups. Three separate models were estimated for our three measures of status: peer-perceived status, peer-perceived agency, and behavioral influence. All variables were standardized. We specified the following model to estimate the concurrent effects of Dominance and Prestige on each measure of status:

555 Level 1: $\text{Status}_{ij} = \beta_{0j} + \beta_{1j}(\text{Dominance})_{ij} + \beta_{2j}(\text{Prestige})_{ij} + r_{ij}$

556 Level 2: $\beta_{0j} = \gamma_{00} + \mu_{0j}$

557 $\beta_{1j} = \gamma_{10} + \mu_{1j}$

558 $\beta_{2j} = \gamma_{20} + \mu_{2j}$

559 Mixed Model: $\text{Status}_{ij} = \gamma_{00} + (\gamma_{10} + \mu_{1j})\text{Dominance}_{ij} + (\gamma_{20} + \mu_{2j})\text{Prestige}_{ij} + \mu_{0j} + r_{ij}$

560 The results of all three models revealed, first, that Dominance and Prestige each predicted
561 greater peer-perceived status ($\gamma_{10} = .70$, $\gamma_{20} = .57$; zs = 17.19 &14.11; both ps < .001), peer-
562 perceived agency ($\gamma_{10} = .77$, $\gamma_{20} = .47$; zs = 13.23 & 8.31; both ps < .001), and behavioral
563 influence ($\gamma_{10} = .15$, $\gamma_{20} = .14$; zs = 1.76 & 1.76; both ps = .09) within-group. Second, these
564 models revealed that Dominance and Prestige together explained the majority of variance in
565 perceived status, $R^2 = .77$, 95%CI [.72, .81], agency, $R^2 = .67$, 95%CI [.60, .72], and a
566 substantially smaller but still significant portion of variance in the behavioral measure of
567 influence, $R^2 = .04$, 95%CI [.001, .10].[6] This is consistent with the Dominance-Prestige account,
568 which predicts that Dominance and Prestige represent the primary pathways to social status, and
569 thus together they should explain the majority of the variation in status differences among
570 individuals. Third, these models demonstrated that all random variance components representing
571 the degree of variation across groups, in the respective effects of Dominance and Prestige on
572 status, were non-significant (peer-perceived status, $\hat{\tau}_{11} = .01$ & $\hat{\tau}_{22} = .01$; peer-perceived agency,
573 $\hat{\tau}_{11} = .02$ & $\hat{\tau}_{22} = .03$; behavioral influence, $\hat{\tau}_{11} = .00$ & $\hat{\tau}_{22} = .06$; all variance components = *ns*).
574 Thus, the groups did not differ in the extent to which Dominance and Prestige predicted status;
575 individuals with greater Dominance and those with greater Prestige tended to uniformly acquire
576 higher status to a similar degree, regardless of the group to which they belonged.

577 **Are Dominance and Prestige Distinct Routes to Status?**

Given that both Dominance and Prestige were positive predictors of all of our measures of social status, it was important to verify that they do, in fact, represent different ways of attaining status. Thus, we next examined whether individuals high in Dominance and Prestige differed on interpersonal likeability, a key dimension of social evaluation. Consistent with theoretical expectations, Prestigious individuals were viewed as highly likeable by both in-lab peers and outside observers, whereas Dominant individuals were viewed as dislikeable by outside observers and neither particularly likeable nor dislikeable by peers. A comparison of these correlations (i.e., likeability with Dominance versus Prestige) revealed that in all cases likeability's association with Dominance differed significantly from that of Prestige (*Z*s = -9.11, -5.05, -6.02, and -4.62, respectively, all *p*s < .001; see Table 2). Thus, Dominance and Prestige appear to be divergent interpersonal strategies to attaining social status.[7]

Does Liking Promote Status?

A key question that arises from these findings is whether interpersonal liking, in the absence of agency, is sufficient for acquiring social status. This question is particularly important within the context of our broader question concerning the viability of various status-attainment strategies; the Dominance-Prestige account holds that although liking is important for Prestige attainment and Dominant individuals tend to be disliked, liking alone is not sufficient for the attainment of either form of status. To address this question, we correlated measures of liking with measures of social status. In-lab peers' perceptions of participants' likeability were positively correlated with their perceptions of participants' social status ($r = .45$) and agency ($r = .32$), and with outside observers' perceptions of status ($r = .29$) and agency ($r = .25$; all *ps* < .01). However, likeability was unrelated to behavioral influence ($r = .02$, *ns*). In contrast, outside observers' ratings of participants' likeability were not significantly related to outside

observers' perceptions of status or agency, or in-lab peers' ratings of status or agency, or the behavioral measure of influence (*r*s ranged from -.02 to -.08, all *ns*). Given this discrepancy between in-lab peers' and outside observers' likeability judgments, it may be that in-lab peers' perceptions of participants' likeability were, to some extent, *post-hoc* constructions formed to rationalize the hierarchy that emerged (Lee & Ofshe, 1981; Sherman, 1983). This is based on the assumption that outside observers would not be motivated to view high-status members as likeable, whereas group members themselves must, in a sense, "live with" the hierarchy that emerged, as well as the finding that behavioral influence was unrelated to likeability ratings from either set of perceivers. These findings also lend support to other theories that conceptualize status as orthogonal to liking (Coie et al., 1982; Foa & Foa, 1974; Wiggins & Trapnell, 1996).

Nonetheless, to more conclusively rule out the possibility that the associations of Dominance and Prestige with social status were driven by liking, we next computed partial correlations between peer-rated Dominance and Prestige and the three measures of status, controlling for peers' liking. As is shown in Table 2 (in parentheses), all effects held controlling for liking, suggesting that likeability is not necessary for the attainment of status and, based on outside-observers' status perceptions and the behavioral measure of influence, it is also not sufficient.

Summary

Study 1 suggests that both Dominance and Prestige are effective routes to social status. This finding emerged from three different kinds of data— (a) ratings of Dominance, Prestige, and social status from in-group peers, (b) ratings of Dominance, Prestige, and social status from outside observer judges, and (c) a behavioral measure of influence. These relations held while controlling for how much participants were liked, suggesting that the effectiveness of

Dominance and Prestige in obtaining social status cannot be attributed to any effects of these strategies on targets' likeability; and, in fact, Dominance and Prestige seemed to have completely opposite effects on likeability.

Study 2

In Study 2, we tested whether the allocation of visual attention—a social outcome described as "the best framework for analyzing social rank as it takes into account all leadership styles" (Hold, 1976, p. 179; also see Chance, 1967)—is associated with both Dominance and Prestige. Despite this theoretical emphasis on visual attention as an indicator of status, we are aware of only two prior studies that examined whether status is associated with receiving greater visual attention in adults. In one of these, observers wearing an eye-tracking device were found to selectively attend to photos of individuals displaying cues of Prestige (i.e., males in professional attire); Dominance was not examined (Maner, DeWall, & Gailliot, 2008). In the other study, individuals engaging in a group task who were rated by other group members as "leading the task" were found to receive the most visual attention from unacquainted observers who wore an eye-tracking device while viewing video-recordings of the group interactions (Foulsham, Cheng, Tracy, Henrich, & Kingstone, 2010). Neither of these studies separately examined Dominance and Prestige, so it remains unclear whether both strategies result in greater visual attention. Theoretically, Dominants may be visually tracked out of fear of unexpected attacks (though direct eye contact may be avoided in cases where Dominants can notice others' stares, which could signal a challenge; Exline, Ellyson, and Long, 1975; Mazur & Booth, 1998), and Prestigious individuals may be carefully monitored to facilitate learning and copying.

The goal of Study 2 was to determine whether gaze allocation patterns corresponded to perceived Dominance and Prestige. By using the video-recorded interactions from Study 1 as

stimuli in Study 2, we were able to measure visual attention received by individuals in a group with demonstrated Dominance and Prestige hierarchies, and test how eye-tracked participants' attention varies as a function of targets' Dominance and Prestige. A final novel feature of Study 2 is that, because we assessed perceived Dominance and Prestige by obtaining ratings from eye-tracked participants who had only very limited exposure to targets (see Method, below), we were able to examine whether these judgments can be made accurately with only minimal information.

Method

Participants and procedure. Fifty-nine undergraduates at the University of British Columbia (61% female) participated in exchange for course credit. All participants were unfamiliar with the target individuals in the video stimuli.[8]

Participants were instructed to watch a series of six 20-second video clips portraying three people working together on the group task described in Study 1 (see Figure 1 for a schematic). Participants were told to "Imagine that you're in the room with these people, working on the task. Please think about which of the people in the group you would want to work with in a subsequent task". These instructions were given to prompt participants to view the video clips in a similar frame of mind as the individuals featured in the clips. While wearing an eye-tracker, participants then viewed the six clips (of the same group of 3 targets) in a randomly determined order (i.e., *not* chronological), to prevent them from discerning Dominance and Prestige on the basis of the sequential content of the interactions, and instead encourage them to focus them on targets' verbal and nonverbal behaviors within each clip. The video clips were shown on a 19-inch computer monitor with a refresh rate of 60 Hz. Participants used a headrest, which minimized head movements and ensured a constant viewing distance of 60 cm, which resulted in a screen size of 40º by 31º of visual angle. Sound was played through a pair of

speakers positioned on either side of the monitor. The Eyelink II system was used to record participants' eye movements with a head-mounted camera. Pupil position was recorded monocularly from the video image of the right eye at 500 Hz.

At the beginning of each of the six clips, a drift-correct marker was presented in the center of the screen, and participants were required to look at the dot and press a key on the keyboard when central fixation was attained. The clip then appeared, and video and audio were played at normal speed for the 20-sec duration. Eye movements were recorded during this time, along with a record of timestamps indicating the onset time of each frame of the video.

After viewing all 6 clips, participants rated the perceived Dominance, Prestige, perceived social status, and likeability of each of the targets in the clips using the same scales as were completed by in-lab peers in Study 1.

Upon completion of all data collection, a research assistant viewed all 24 clips at reduced speed and logged the beginning and end of each utterance or verbalization made by each target. This was repeated three times per clip (once for each target), to accurately assess the total number of seconds each target spoke. Speaking duration times were subsequently divided by the length of each associated clip (i.e., 20-sec), to determine the proportion of time within each clip each target was speaking, then aggregated across the 6 clips to determine each target's overall mean proportion of speaking time. Speaking time was subsequently entered into analyses as a covariate, given our expectation that it would significantly affect Dominance, Prestige, and visual attention.

Stimuli. Four sets of video clips portraying a trio of Study 1 participants completing the group decision-making task were selected from all available clips on the basis of the relative Dominance and Prestige ratings (made by in-lab peers in Study 1) of the targets. Given our goal

of testing whether both highly Dominant and highly Prestigious individuals are likely to receive greater visual attention from onlookers compared to individuals who score low on either dimension, we wanted to ensure that each video clip featured individuals who differed substantially from each other in perceived Dominance and Prestige. Indeed, across the four sets of videos, there was a significant difference in in-lab peer perceived Dominance (based on Study 1) between targets with the highest score ($M = 4.77$) and those with the lowest score [$M = 2.04$; $d = 4.59$, $t(6) = 6.49$, $p < .01$]; and a significant difference in in-lab peer-perceived Prestige between targets with the highest score ($M = 5.76$) and those with the lowest score [$M = 4.45$; $d = 2.40$, $t(6) = 3.40$, $p < .05$].

Participants viewed 6 clips, each 20-sec in length, from each of the 4 video sets. These were selected by a research assistant blind to research hypotheses who was instructed to select segments during which a key decision was made by the group. Each participant viewed clips of only one set of targets (i.e., 6 clips from the same interaction).

Results and Discussion

Data analytic approach. To determine the amount of visual attention participants paid to each target, a region of interest (ROI) was defined around each target, at a consistent size of 10.9º by 14.1º (see Figure 1). Fixations landing within a target's prescribed ROI were classified as attention allocated to that target. Two indices of attention—mean proportion of fixations out of the total number of fixations made, and total fixation duration—were computed for each participant. Mean proportion of fixations was computed by dividing, for each participant, the total number of fixations that fell within a given target's ROI by the total number of fixations that occurred during the 20-sec clip, averaged across all 6 clips. Total fixation duration was computed by taking, for each participant, the sum duration of all the fixations (in sec) on a given

target's ROI, across all 6 clips. This index reflects differences in the total length of time participants gazed at each target, over and above the number of fixations, and is thus qualitatively distinct from the proportion of fixations.

For each index of attention, our study design yielded three observations for each participant—one for each of the three targets in each clip. These three attention scores were grouped and nested within each participant, potentially leading to a lack of independence for individual observations within subjects, and thus violating assumptions of independence and homoscedasticity in ordinary least squares-based approaches (Bliese & Hanges, 2004; Kenny & Judd, 1986). Indeed, intra-class correlations indicate a high degree of covariation among observations within each participant cluster for the mean proportion of fixations index (ICC = -.32) and the total fixation duration index (ICC = -.30).[9] Thus, to account for the non-independence between observations produced by such nesting, clustered robust standard errors were used to derive accurate estimates of standard errors (Wooldridge, 2003).[10]

Do Dominant and Prestigious individuals receive greater visual attention? We conducted two multiple regression analyses predicting each index of attention (proportion of fixations and total fixation duration) on eye-tracked participants' ratings of each target's perceived Dominance and Prestige and two control variables: target speaking time and seating position (i.e., whether the target was assigned to sit in the left, right, or center position at the table). To facilitate interpretation, all predictors were grand mean centered, with the exception of seating position, which was dummy coded (as 0 for side, or 1 for center; our assumption was that the center-seated target might receive greater attention than the other two due to his/her position).[11] In all models, we used clustered robust standard errors, clustering on participants

738 because the analyses compiled repeated observations from the same eye-tracked participants,
739 who each provided multiple observations.

740 Table 3 presents the two regression models. Controlling for eye-tracked participants'
741 judgments of target's Prestige, speaking time[12], and seating position, the regression coefficients
742 for Dominance were statistically significant and positive in both models, indicating that a 1-point
743 increase in perceived Dominance was associated with a 2% increase in proportion of fixations
744 and 2.11 additional seconds of total fixation duration. Similarly, controlling for targets'
745 perceived Dominance, speaking time, and seating position, the regression coefficients for
746 Prestige were significant and positive in both models, indicating that a 1-point increase in
747 perceived Prestige was associated with a 2% increase in proportion of fixations and an additional
748 1.94 seconds of total fixation duration.

749 In both models, speaking time and seating position also emerged as significant predictors,
750 suggesting that these factors also influenced attention, as expected based on previous research
751 (Aries, Gold, & Weigel, 1983; Cashdan, 1998; Cohen, 1994; Mast, 2002; Mullen, Salas, &
752 Driskell, 1989). Speaking time was also positively associated with eye-tracked judges'
753 perceptions of Dominance (r = .68) and Prestige (r = .35). There were no perceiver gender or
754 target gender main or interactive effects.

755 If Dominance and Prestige represent the primary pathways to social status, the two
756 strategies together should explain substantial portions of variance in attention. To test this
757 prediction, we next ran separate regression models with proportion of fixations and total fixation
758 duration as outcomes, and eye-tracked judges' ratings of Dominance and Prestige as predictor
759 variables [here, the two predictor variables showed a small positive association (using clustered
760 robust standard errors), $\beta = .20$, $t(58) = 2.86$, $p < .01$], after standardizing all variables. Again,

clustered robust standard errors were used. As expected, Dominance and Prestige were each significantly associated with both measures of attention—proportion of fixations, βs = .56 and .24, $t(58)$s = 7.79 and 3.72, ps < .001, and total fixation duration, βs = .55 and .23, $t(58)$s = 7.03 and 3.36, ps < .01. Furthermore, perceived Dominance and Prestige explained considerable amounts of variance in proportion of fixations, R^2 = .48, 95%CI [.31, .65] and total fixation duration, R^2 = .46, 95%CI [.28, .64]. Together, these results suggest that both Dominance and Prestige were strongly associated with receiving heightened visual attention, and these effects were independent of how much targets spoke and where they sat.

To ensure that eye-tracked judges' perceptions of targets' dominance and prestige was accurate, we next examined correlations between these judges' ratings of targets and those made by Study 1 in-lab peers, on these dimensions. Results indicated that the two sets of viewers showed substantial agreement in their ratings of targets' Dominance and Prestige (rs = .79 for Dominance and .66 for Prestige, ps < .05; note that these correlations were conducted across the 12 targets, not across participants). These correlations are particularly noteworthy given that the two sets of participants had access to substantially different amounts of information and made their ratings after engaging in very different tasks (i.e., viewing and interacting with targets face-to-face for 20-minutes with the goal of completing a collaborative task, versus viewing targets on video for a total of 120-sec truncated into fragmented and randomized 20-sec segments, with the goal of "imagining" that they were interacting with them). This high level of convergence suggests that both sets of perceptions were valid measures of targets' use of Dominance and Prestige strategies. Furthermore, these correlations also suggest that even under conditions of very limited exposure, observers can make highly accurate judgments of Dominance and Prestige.[13]

Does Liking Promote Social Attention? To examine whether the effects of Dominance and Prestige on visual attention might be due to targets' likeability, we next separately regressed each of the two attention indices on eye-tracked participants' ratings of targets' likeability, Dominance, and Prestige, as well as speaking time and seating position. As in the previous models, we used clustered robust standard errors to account for the non-independence of observations in the outcome variables. In both models, all predictor variables—except for perceived likeability [$\beta = -.03$, $t(58) = -.37$, *ns*, for proportion of fixations; and $\beta = -.00$, $t(58) = -.01$, *ns*, for total fixation duration]—significantly predicted the distribution of attention. Thus, after controlling for likeability, speaking time, and seating position, perceived Dominance was still associated with an increase in proportion of fixations [$\beta = .17$, $t(58) = 2.18$, $p < .05$] and total fixation time [$\beta = .17$, $t(58) = 2.06$, $p < .05$], as was perceived Prestige, with proportion of fixations [$\beta = .18$, $t(58) = 2.26$, $p < .05$], and total fixation time [$\beta = .15$, $t(58) = 1.96$, $p < .05$, one-tailed]. Thus, the increased social attention received by highly Dominant and Prestigious targets cannot be attributed to how much these targets were liked or disliked and, in fact, the extent to which targets were viewed as likeable did not affect the amount of attention they received.

General Discussion

The primary aim of the current research was to examine whether Dominance and Prestige are distinct yet viable avenues to attaining social status. Using a multi-method approach—in which social status was operationalized both as in-lab peers' and outside observers' perceptions of social status, as well as actual, behavioral influence over decision-making in a collaborative task—Study 1 demonstrated that individuals high in both Dominance and Prestige (as rated by in-lab peers and outside observers) tended to receive higher status during a group task. Study 2

807 replicated this finding with status operationalized as social attention; both high-Dominance and
808 high-Prestige group members tend to receive greater visual attention from outside observers than
809 low-status group members. This result was replicated across two measures of visual attention and
810 two sources of Dominance and Prestige perceptions, and held controlling for speaking time and
811 seating position. Together, these two studies provide evidence for the central claim of the
812 Dominance-Prestige account: that both Dominance and Prestige are effective strategies for
813 attaining social status in contemporary human groups, even within the same social group.

814 Although previous studies have identified distinct micro-level personality traits and
815 attributes that are associated with Dominance or Prestige (Buttermore, 2006; Cheng et al., 2010;
816 Johnson et al., 2007; Reyes-Garcia et al., 2008), this is the first research to examine the
817 concurrent efficacy of the two strategies for attaining status and influence. In addition, while
818 previous work examined long-term Dominance and Prestige hierarchies in pre-existing social
819 groups, the present research demonstrates that both hierarchies emerge rapidly among members
820 of short-term, newly acquainted groups who interact for only 20-minutes. The finding that
821 differences along both dimensions emerged spontaneously and reliably in brief social encounters,
822 and that individuals' ranks on each dimension were readily apparent to peers within the group,
823 outside observers, and eye-tracked observers who viewed each interaction for only 120-sec of
824 fragmented moments, suggests that individual differences in the use of these strategies are
825 fundamental to the formation of interpersonal relationships, and that individuals are highly
826 attuned to accurately perceiving these differences.

827 These findings are also consistent with a large body of research demonstrating high levels
828 of consensus and accuracy in person judgments from only brief observations of "thin sliced"
829 behavior (e.g., Ambady & Rosenthal, 1992; Funder & Colvin, 1988). The present research adds

to this literature by demonstrating that Dominance and Prestige, too, can be very quickly and accurately judged. This ability may be shaped by selection pressures on subordinates to monitor and pre-empt attacks from Dominants and maximize opportunities to acquire fitness-enhancing cultural information from Prestigious individuals. Study 2 suggests that, in both cases, these quick perceptual abilities may be facilitated by automatic visual attention patterns.

Implications for the Evolutionary Foundations of Human Social Status

The finding that Dominance and Prestige can coexist within the same social groups as viable status strategies suggests that human status hierarchies are multidimensional. This finding stands in contrast to the social-functional perspective, which maintains that intimidation and aggression are ineffectual for status attainment, and that the only viable route to influence is via competence and generosity (e.g., Anderson & Kilduff, 2009a; 2009b; Barkow, 1975; Ridgeway & Diekema, 1989). Our findings also challenge the social-dominance view, which holds that individuals acquire status by displaying dominance and threat but *not* by signaling their abilities and competence. By supporting the Dominance-Prestige account, the present findings integrate the two narrower accounts, and thus reconcile a longstanding division in the literature on social status. When considered jointly, Dominance and Prestige explain a substantial portion of variation between individuals in social status, consistent with the theoretical notion that the two status strategies form the core foundations of human social status.

They also suggest that many of the fairly wide range of narrow attributes and behaviors previously found to be associated with status likely demonstrated those relations because they are part of one of the two fundamental strategies. Specifically, prior evidence for an association between high status and physical strength (Schjelderup-Ebbe, 1935), aggression (Griskevicius et al., 2009), toughness (Cashdan, 1998), threatening and coercive behavior (Kyl-Heku & Buss,

1996), assertiveness (Gibb, 1968; Lord et al., 1986; Stogdill, 1948), need for power (Flynn, Reagans, Amanatullah, & Ames, 2006; Winter, 1988), anger (Tiedens, 2001; Van Kleef, Homan, Beersma, & van Knippenberg, 2010), narcissism (Brunell et al., 2008), over-confidence (Anderson & Brion, 2011), and prioritizing self- over group-interest (Maner & Mead, 2010), may be more parsimoniously viewed as reflecting Dominance-based processes. Likewise, evidence for an association between status and the possession of valuable skills (Berger et al., 1972; Ellis, 1994; Lord et al., 1986), task ability (Driskell et al., 1993), intelligence (Lord et al., 1986; Stogdill, 1948), perceived competence (Anderson & Kilduff, 2009b), specialized knowledge (Mesoudi, 2008; Van Vugt, 2006), altruism (Hardy & Van Vugt, 2006; Willer, 2009), helpfulness (Flynn et al., 2006), generosity, honesty, responsibility, fairness (Lord & Maher, 1991), and charisma (Awamleh & Gardner, 1999) may in fact reflect Prestige processes. The present research is the first to bring together all of these seemingly disparate sets of findings in one coherent model, and to provide an empirically supported account that suggests that the social-functionalist and social-dominance perspectives are not in fact incongruous, but rather that human social status is dual faceted.

Distinctions similar to Dominance and Prestige have been made in anthropology (e.g., Krackle, 1978; Barkow, 1975; Chance & Jolly, 1970), psychology (e.g., Gilbert, Price, & Allan, 1995; Magee & Galinsky, 2008), and sociology (e.g., Kemper, 1990), based on inductive inferences; however, the framework adopted here has several advantages over these earlier models. First, it explains why subordinates in human social groups seem to demonstrate two notably distinct ethological and psychological patterns directed at different high-status individuals—copying and deferring to some leaders while avoiding and fearing others, as well as differential patterns of imitation, memory, attention, and persuasion in the presence of these

different leaders (for a review, see Henrich & Gil-White, 2001). Second, it explains *why* certain socially attractive qualities (e.g., expertise and success) promote high status. Third, it can account for group and cultural differences in the traits and abilities that lead to high status; for example, why athletic ability is valued among adolescent boys but not academic scholars. In sum, by positing a cultural learning process to account for Prestige hierarchies and employing evolutionary logic, the Dominance-Prestige account provides a basis for understanding the distal forces that shape preferences for social models and processes of social influence.

More broadly, our findings lend support to the theoretical account of Prestige as having arisen in response to the evolution, in humans, of cultural learning capacities. With the emergence of capabilities for acquiring cultural information, it likely became adaptive for individuals to acquire such knowledge from skilled social models, resulting in a human psychology in which individuals ingratiate themselves to skilled others by displaying deference. This in turn permits subordinate learners access to Prestigious models, who allow copying and thus exert further influence over learners. Consistent with this account, our results indicate that individuals pay greater attention to Prestigious others than non-Prestigious, and defer to their opinions (as evidenced by the finding that Prestigious individuals scored higher on the behavioral measure of influence in Study 1), despite our finding that these individuals, in contrast to Dominants, are not viewed as threatening and are well liked. The present findings are thus compatible with the theory of Prestige as resulting from the evolution of cultural transmission (see Henrich & Gil-White, 2001; Boyd & Richerson, 1985); in our view, this account provides the most parsimonious and empirically supported framework for the extant data.

The present findings also raise questions for accounts of human social status as being exclusively Prestige-based, having evolved (or "exapted") from earlier Dominance hierarchies

seen in other animals (Barkow, 1975). Given the evidence that emerged here for the prevalence and viability of Dominance, it seems reasonable to conclude that human social status is characterized by the co-occurrence of both strategies, even among groups of university students who are presumably more oriented than average toward the attainment of cultural knowledge, and not particularly fearful of threat of force in a laboratory-based situation. Given the importance of agonistic contests in virtually all nonhuman animal social hierarchies (Mazur, 1973), Dominance in humans likely represents an evolutionarily ancient system which, despite the rise of Prestige, remains operative. Human Dominance is not, however, limited to physical conflict; in most contemporary societies it is likely more frequently wielded by controlling costs and benefits in non-agonistic domains.

One potentially unique feature of human hierarchies is that merit-based institutional positions, which are attained via the demonstration of skill and ability, are typically endowed with the control of costs and benefits, and thus can evoke Dominance-oriented behaviors, resulting in the simultaneous use of both strategies (also see Magee & Galinsky, 2008). Indeed, in the present as well as previous research (Cheng et al., 2010), Dominance and Prestige were statistically independent, suggesting that individuals could concurrently adopt both strategies, consistent with developmental studies showing that some children simultaneously demonstrate both pro-social and coercive relational styles (Hawley, Little, & Pasupathi, 2002).

Finally, the present research also has implications for research on the evolutionary origins of leadership (e.g., Van Vugt, 2006; Gillet, Cartwright, & Van Vugt, 2011). Although we focused more on status and influence than leadership, effective leadership depends on inducing social influence (Bass, 1990; Hollander, 1985; Hollander & Julian, 1969), suggesting that Dominance and Prestige may also underpin two alternative styles of leadership. Consistent with

this notion, researchers have delineated two contrasting leadership personalities, termed 'selfish' and 'servant' (Gillet et al., 2011; Greenleaf, 2002; Wilson, Van Vugt, & O'Gorman, 2008). Selfish leaders have been found to exploit their positions of power and take more than followers from a common resource, out of feelings of entitlement. Their behaviors contrast sharply with those of "servant" leaders, who engage in self-sacrificial, altruistic behaviors to promote group cooperation at a cost to themselves (De Cremer & Van Dijk, 2005; Gillet et al., 2011; O'Gorman, Henrich, & Van Vugt, 2009). A similar distinction can be found in studies comparing "autocratic" and "democratic" approaches to leadership (Lewin, Lippit, & White, 1939).

Our findings also shed light on the prevalence of narcissistic, aggressive, and manipulative egotists in leadership roles, such as company presidents and chief executive officers (Brunell et al., 2008; Deluga, 1997; Fast & Chen, 2009; Rosenthal & Pattinsky, 2006; Van Vugt, 2006; Wasylyshyn, 2005; Workplace Bullying Institute & Zogby International, 2010), and the multitude of kings, emperors, tyrants, and dictators who have throughout history exploited their leadership positions for self-benefit at the cost of the group (Betzig, 1993). The high status of these despots may be explained by their effectiveness in deploying a Dominance strategy. These individuals may rely on Dominance-oriented behaviors as a result of insecurities about their ability to attain broadly recognized Prestige; indeed, recent findings suggest that powerful individuals become aggressive when they perceive themselves as incompetent (Fast & Chen, 2009).

Limitations and Future Directions

One limitation of the present research is our reliance on a correlational approach, which prevents us from directly addressing questions of causality—whether Dominance or Prestige are causal antecedents to status. However, given that Dominance and Prestige are latent perceptions

945 constituted from the sum of numerous more specific social attributes, behaviors, and
946 interpersonal traits, manipulating any single attribute would likely be ineffective to promote a
947 genuine, believable Dominant or Prestigious reputation. Nevertheless, one important future
948 direction is to directly test the causal model indicated by our theoretical account.

949 Another important direction is to examine whether the present findings generalize to
950 stable long-term groups. Previous research suggests that both dimensions exist and can be
951 reliably assessed within such groups (Cheng et al., 2010; Reyes-Garcia et al. 2008; 2009), and
952 that in at least one long-term group (university athletic teams), both Dominant and Prestigious
953 individuals are perceived as leaders by other group members (Cheng et al., 2010). Thus, it seems
954 likely that the present results represent Dominance and Prestige dynamics as they occur in real-
955 world, long-term social hierarchies, but this should be tested in future research.

956 Given the evolutionary framework of the present research, another limitation is our
957 inclusion of only North American undergraduates, who are often not representative of most of
958 the world's populations (Henrich, Heine, & Norenzayan, 2010). Future studies are needed to
959 replicate these findings in diverse populations, to test whether the status-promoting effects of
960 Dominance and Prestige generalize across human societies. Previous research is consistent with
961 this expectation; Dominance and Prestige hierarchies have been documented in culturally and
962 geographically diverse populations, including the Tsimane'—a highly egalitarian population of
963 forager-horticulturalists in the Bolivian Amazon (Reyes-Garcia et al., 2008; 2009; also see von
964 Rueden et al., 2008)—as well as industrialized populations from the United States and Canada
965 (Buttermore, 2006; Cheng et al., 2010; Johnson et al., 2007)—but these studies have not tested
966 whether both strategies, defined in terms of higher order, widely-encompassing reputations—are
967 associated with social status in these diverse groups.

In conclusion, although the pursuit of social status is a recurrent, pervasive, and universal feature of human societies, only recently has a parsimonious evolutionary account emerged that can unify the diverse and seemingly contradictory empirical findings regarding status attainment. The present research provides support for the Dominance-Prestige account, and demonstrates that while both are effective status strategies, they are underpinned by divergent interpersonal behaviors and perceptions.

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Table 1. Correlations among peer-rated indices of status, Study 1.

	Dominance	Prestige	Perceived Social Status	Agency	Behavioral Measure of Influence
Dominance	1	-	-	-	-
Prestige	.01	1	-	-	-
Perceived Social Status	.68**	.57**	1	-	-
Agency	.69**	.45**	.88**	1	-
Behavioral Measure of Influence	.17*	.17*	.22**	.30**	1

Note. $N = 177$.

* $p < .05$. ** $p < .01$.

Table 2. Correlations of Dominance and Prestige (as Rated by In-Lab Peers and Outside Observers) with Measures of Social Status and Liking, Study 1

	In-Lab Peer-Rated		Outside Observer-Rated	
Measures	Dominance	Prestige	Dominance	Prestige
In-Lab Peers' Ratings				
Status	.68** (.79**)	.57** (.40**)	.59** (.62**)	.63** (55**)
Agency	.69** (.75**)	.45** (.33**)	.59** (.59**)	.60** (.54**)
Likeability	-.06	.73**	.13†	.49**
Outside Observers' Ratings				
Status	.57** (.54**)	.38** (.44**)	.70** (.71**)	.73** (.70**)
Agency	.56** (.52**)	.35** (.41**)	.69** (.69**)	.64** (.61**)
Likeability	-.18**	.38**	.09	.43**
Behavioral measure of influence	.17* (.17*)	.17* (.22**)	.11 (.11)	.13† (.14†)

Note. $N = 191$. Partial correlations controlling for likeability are presented in parentheses.

† $p < .10$ * $p < .05$ ** $p < .01$.

Table 3. Linear Regressions Predicting Visual Attention from Eye-Tracked Participant-Rated Dominance and Prestige, Controlling for Speaking Time and Seating Position, Study 2.

	Measure of Attention					
	Proportion of Fixations			Total Fixation Duration (s)		
Predictor Variable	*b* (SE)	β	*t*	*b* (SE)	β	*t*
Dominance	.02 (.01)	.18	2.47*	1.60 (.76)	.17	2.11*
Prestige	.02 (.01)	.16	3.09**	1.94 (.73)	.15	2.65*
Speaking Time	.43 (.05)	.48	8.97**	53.69 (6.63)	.49	8.09**
Position†	.06 (.02)	.47	3.60*	6.11 (1.84)	.44	3.32**
R^2		.66			.64	

Note. $N = 177$. Clustered robust standard errors were used to adjust for non-independence of observations resulting from repeated observations from the same participants, 59 individuals (clusters).

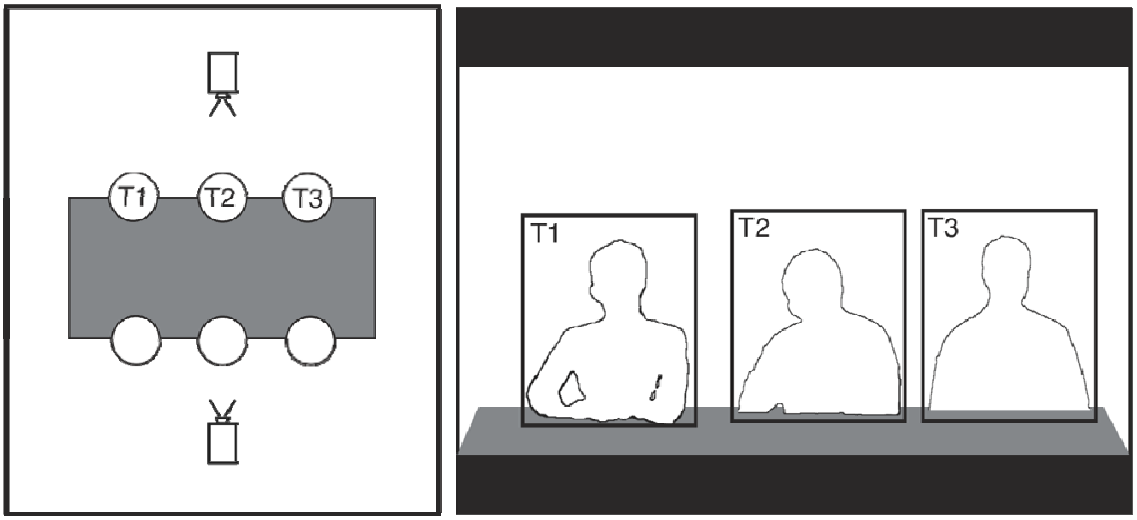
* $p < .05$. ** $p < .01$. †Position is an individual-level dummy variable with "0" representing seating on the left or right side, and "1" representing center position.

Figure Captions

Figure 1. Set up of Study 1 group interaction, Panel A, and example of video clip stimuli that Study 2 participants and Study 1 outside observers viewed, Panel B. Cameras were positioned at either side of the table during the group interaction, and videos portrayed three participants (i.e., targets T1, T2, and T3) in each group. The boxes around each target in Panel B represent regions of interest (ROIs), which were demarked to allow for the tallying of the total amount of visual attention paid to each target in Study 2.

Figure 2. Visual attention, operationalized as proportion of fixations, Panel A, and total fixation duration, Panel B, received by targets as a function of their Dominance and Prestige ranks, controlling for speaking time and position, Study 2. Error bars represent standard error of the mean.

Figure 1.



Panel A Panel B

[1] The Dominance-Prestige account predicts that the evolution of Prestige depends on two factors: the emergence of high-fidelity cultural learning and group living. It is possible that other social species may eventually be found to satisfy these conditions (e.g., whales and dolphins), as we learn more about culture in non-human animals. At this point, however, no other species seems to have sufficiently high fidelity cultural learning for Prestige hierarchies to become a likely outcome, though some have made arguments for chimpanzees (Horner, Proctor, Bonnie, Whiten, & de Waal, 2010). More limited forms of social learning that target particular behavioral domains (e.g., mate choice, foraging patch selection), have been found in species ranging from fish to chimpanzees, but in these cases domain-specific expertise does not translate to cross-domain social influence, as is the case for Prestige (Rendell et. al., 2011).

[2] We use the term "behavioral strategy" to suggest a suite of subjective feelings, cognitions, motivations, and behavioral patterns that together lead to certain outcomes.

[3] In the present context, perceiver effect quantifies the degree to which a perceiver/rater tends to perceive a consistent level of social status across all group members. Some perceivers tend to rate all others high in status, while others generally see others as low in status. Relationship effect indexes the unique relationship between two persons by measuring the degree to which a perceiver rates a given target as particularly high in status, over and above the perceiver's general tendency to see others as influential (i.e., perceiver effect), as well as the target's tendency to be seen by all other group members as influential (i.e., target effect; Kenny, Kashy, & Cook, 2006).

[4] For comparison, round-robin studies of Extraversion, a highly visible trait which tends to elicit substantial observer agreement, typically show relative target variance levels of approximately 30% (Kenny, Albright, Malloy, & Kashy, 1994).

[5] Significance tests of variance components are conducted with one-tailed tests, as variances in principle cannot be negative.

[6] The relatively smaller magnitude of this coefficient of determination may have resulted from the fact that in order to be influenced, participants would need to not only agree with some other, but also overturn their own previous private decision, which individuals tend to resist (Mather, Shafir, & Johnson, 2000).

[7] To examine whether Dominance and Prestige interact to predict status (i.e., is the highest level of status found among individuals who adopt both strategies simultaneously?), we conducted a number of regression analyses separately predicting perceived social status, agency, and the behavioral measure of influence from Dominance, Prestige, and the Dominance × Prestige interaction. The interaction term across all three models were not statistically significant [perceived social status: $\beta = .03$, $t(187) = .98$, *ns*; agency: $\beta = -.07$, $t(187) = -1.68$, *ns*; behavioral influence: $\beta = -.09$, $t(187) = -1.39$, *ns*], suggesting no interactive effects over and above the significant main effects of Dominance and Prestige.

[8] These data were drawn from a larger study examining visual attention and social status perceptions (see Foulsham et al., 2010).

[9] Negative empirical estimates (and population values) of the intra-class correlation can arise when the average covariance among the items is negative (Shrout & Fleiss, 1979), reflecting the bounded nature of the data here; that is, greater visual attention to one target would necessarily lead to less attention to other targets (see Kenny et al., 2006, p. 33 for another example).

[10] Multi-level models—in which participants' ratings of each target's perceived Dominance and Prestige and speaking time constituted Level-1 variables and participants constituted a Level-2 variable—could not be fit to these data because of redundancy in the observations of the dependent variables (i.e., amount of attention paid to Target 1 necessarily decreased the amount of attention paid to Targets 2 and 3, and attention paid to Target 3 could be almost perfectly predicted from the amount of attention paid to Targets 1 and 2). Thus, we used robust standard errors, an econometric technique commonly used to handle clustered data, instead of multi-level modeling. In addition, all results reported below hold when 3 dummy variables were entered as covariates in the models to account for any potential differences due to the 4 different clip sets used.

[11] We also ran analyses with two dummy codes representing the three seating positions (left, center, or right). In all models, there was no significant effect of left vs. right seating position.

[12] It is noteworthy that controlling for speaking time is a conservative approach to testing the effects of Dominance and Prestige on attention. Theoretically, Prestigious individuals should be deferred to and invited to speak (by subordinates who wish to acquire their skills and knowledge), whereas Dominant individuals should forcefully occupy discussions. Thus, increased speaking time is a theoretically predicted effect endogenous to Dominance and Prestige processes, and not necessarily a confound. Nonetheless, by controlling for speaking time we were able to ensure that differences found were not entirely attributable to how much each target spoke.

[13] Of note, we could not directly test whether eye-tracked participants' attention covaried with targets' Dominance and Prestige as judged by in-lab peers from Study 1 because there were too few observations on the dependent variable; only 12 Dominance or Prestige in-lab peer-rated scores were available. Though we considered converting the Study 1 continuous peer-ratings into relative Dominance and Prestige categorical ranks and using ANCOVA to address this issue, we realized this was not possible because of the naturalistic design of the study. Targets were not seated according to their Dominance or Prestige ranks (since these emerged only afterward), so the three factors of Dominance, Prestige, and seating position (the last of which must be included as a covariate, given the natural tendency for center-seated targets to receive the greatest visual attention) were not fully crossed at each level. In fact, no targets (and thus observations) were available in the following cross-tabulated cells: low-Dominance, center-seating position; and medium-Prestige, center-seating position.