TITLE: Social Status Modulates Prosocial Behavior and Egalitarianism in Preschool Children and Adults

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SHORT TITLE: Social Status Affects Prosocial Behavior

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Abstract

Humans are a cooperative species, capable of altruism and the creation of shared norms that ensure fairness in society. Yet, individuals with different educational, cultural, economic, or ethnic backgrounds differ in their levels of social investment and endorsement of egalitarian values. We present four experiments showing that subtle cues to social status (i.e., prestige and reputation in the eyes of others) modulate prosocial orientation. The experiments found that individuals who experienced low status showed more communal and prosocial behavior, and endorsed more egalitarian life goals and values compared to those who experienced high status. Behavioral differences across high and low status positions start to appear early in human ontogeny (4-5 years of age).

Significance Statement

Even though humans are the most altruistic species, disparities in prosocial orientation are common and occur across social groups that vary in education, sex roles, biology, and financial resources. In the present research, using different manipulations of social status -defined as the level of social prestige and reputation enjoyed by individuals in the eyes of others– we show that mere incidental low status triggers a prosocial orientation manifested in helping behavior, signaling communal intent, and the endorsement of egalitarian goals and values. These effects start to appear early in human ontogeny. The findings suggest that humans have basic cognitive and motivational programs that they use flexibly as they navigate unstable hierarchies typical in human societies.

\body Social hierarchies are ubiquitous and can be found between individuals and groups, be it between occupations, neighborhoods, social class, age and race groups. The position individuals occupy in the social hierarchy has a marked influence on their cognition and behavior. Members of disadvantaged social groups, such as ethnic minorities, women and individuals with low socioeconomic status (SES), are socially more attentive and affiliative compared to their advantaged counterparts (1, 2, 3). For example, individuals with low SES can better identify the emotional states of others compared to those with high SES (3). Immigrants have more complex and differentiated social group perceptions than national citizens of the same socioeconomic background (4). Ethnic minorities, such as Black people and Hispanics, are more interdependent and less individualistic, compared to Caucasians (5). Women affiliate more and endorse more benevolent values than men (2). Interestingly, rank differences in social investment have also been observed in other primate species. Low rank monkeys and apes follow more the gaze of others (especially of high rank animals), groom more, yield more space, show more appeasing displays and less aggression than their high rank counterparts (6, 7). In this article we test a new account for hierarchy differences in human social investment, based on the causal effects of status independently of the specific contributions of ethnicity, SES or gender.

The origins of hierarchical differences in social investment are multifaceted. They can derive from differences in education, income, culture, opportunities to exercise power, and the genome, all of which can impact social cognition and behavior. To illustrate, during development, parents from low SES emphasize respect and conformity in their children, whereas those at the high echelons emphasize self-direction (8). These

differences can affect egalitarianism (9, 3), and subsequently the extent to which individuals care for the welfare of others (3). Furthermore, high SES typically endows individuals with financial resources, known to increase their social power (1, 10). Social power refers to tangible control over others and resources, and increases the ability to pursue organizational and personal goals (11), while decreasing the need to pay attention and care for other individuals (12). Therefore, power holders are generally not prosocial (13). It is therefore not surprising that income, a component of SES that affords power, decreases benevolence or the extent to which individuals value the welfare of others (9). In summary, individuals who differ in SES (similarly to those who differ in ethnicity or gender), typically traverse a cluster of unique experiences throughout their lives that jointly affect the extent to which they are oriented towards the needs and welfare of others (1). These influences affect behavior through the application of mental operations, such as the activation of goals and values, used to fulfil the needs of the individual in the social context. A crucial task for social scientists is, therefore, to identify the core triggers of the motivational programs that affect altruism. This is one of the aims of the present article.

Across domains, hierarchical positions typically co-vary with social prestige, reputation and esteem that individuals hold in the eyes of others, that is, their *status* (14). For example, White people enjoy more social regard and are less discriminated against than Black people, men attain more prestigious social positions than women, and people with high SES benefit from higher deference and reputation than those with low SES (15, 16). Status differences are a common thread across these groups, and could underlie the altruism differences found in correlational evidence. Here we hypothesize that status has

a causal role in the extent to which individuals invest socially, and, in particular, the extent to which they are prosocial, that is, benefit others and care for others' wellbeing. Importantly, status is a distinguishable component of hierarchy. For example, individuals with high SES (e.g., bankers, the *nouveau riche*) and high power (e.g., dictators) are often despised. Through experimental work we investigate status-specific determinants of prosocial behavior and related mental representations, in different phases of human development.

Status could play a role in altruism because of its privileged value in human interactions, and the benefits of prosocial behavior. A great deal of research has shown that humans need to be socially valued. Humans automatically track their evaluative rank in social contexts, and identify another's rank in incidental observations, as shown in differential activity in the ventral striatum of the brain (17), as well as in physiology (18). In performance domains, knowledge of one's inferior status (or social evaluation) triggers physiological threat responses in the perceiver (18). Implicit signals of low status in small groups, via feedback about one's lower performance in relation to others, temporarily reduce the IQ, and lead to associated brain responses (amygdala and dorsolateral prefrontal cortex, 19). In addition, temporarily induced changes in the relative prestige and reputation of one's social groups markedly affect self and intergroup perceptions, as well as behavior (20).

In spite of the acknowledged importance of social prestige and reputation, whether they affect prosocial behavior independently of factors associated with chronic low status, such as education, culture, income, ethnicity or gender roles, remains largely unknown. We propose that individuals automatically monitor their relative prestige and

respect in social interactions as they navigate the social world, and that their position modulates their prosocial behavior and related mental representations. Thus contrary to the common notion that people differ in generosity and altruism based solely on their background and personal dispositions, we propose that they also flexibly care for the welfare and needs of others, depending on their prestige and reputation in the current situation, which they eagerly monitor, even on the basis of incidental signals. Furthermore, we predict that status affects the broad spectrum of behavior and cognition, spanning from prosocial acts to signaling behavior, to life goals and values.

These predictions derive from the detrimental effects of low status for individuals, and the compensatory benefits of prosocial behavior and egalitarian ideologies. Low social status is associated with substantial disadvantages that hinder human's optimal social coordination strategies. Individuals with low status experience social discrimination and ostracism (15, 16, 20), have less access to valuable social models to learn from, and have less opportunities (14). Chronic low status, associated with low SES or ethnic minority membership, leads to stress, decreased wellbeing and poor health, including increased mortality (21), as well as cognitive underperformance when low status is salient (15, 22).

Low status individuals could prioritize prosocial behavior and associated goals and values as a way to regulate social interactions and construe a niche that best fits their needs and counteracts their disadvantages. Niche construction is a process originally documented in evolutionary biology whereby organisms change their environment in ways that affect their fitness (23, 24).

Prosocial behavior is a powerful signal of positive intentions and confers a number of immediate benefits. Altruistic acts enhance status in the eyes of others (25), increase the potential for support and coalition formation, and protect individuals from ostracism and threat (23). Prosocial behavior could be particularly adaptive for low status individuals, as a way to increase their status, social support and the possibility of forming alliances.

Given that social rank affects social investment in nonhuman primates, in humans, basic forms of status related social investment may not necessitate complex social cognition, and could emerge early in ontogeny. This should be seen in rudimentary prosocial acts, independently of moral reasoning and before values have been formed. With increased cognitive abilities, in adulthood status could affect individuals in more fundamental ways, transforming their planning, life goals and value systems. These symbolic means are used to make sense of the social environment, guide behavior, and create a socially shared reality.

We propose that incidental signals of low status automatically affect adult mental representations, pulling individuals towards social fairness for all. This proposition differs from the Machiavellian hypothesis of cognitive evolution (26), which posits that cooperation evolved as a manipulative strategy to beat other group members in a complex and competitive social environment. A change in life goals and values would not be consistent with such self-serving, competitive strategies.

Status is freely afforded to individuals who have valuable attributes, such as expertise and competence (27). Therefore, high status confers various advantages, such as social support and easier access to opportunities. Given these advantages, high status

individuals may invest in maintaining their hierarchical positions, for example, by signaling competence and by endorsing and disseminating values that maintain the status quo (16, 27).

Status related prosocial behavior could derive from the application of algorithms that use cognitive and motivational specializations flexibly (28, 29), as individuals navigate the dynamic social relations that characterize human societies. The nature of prosocial behavior and underlying cognitive and motivational processes should vary across the lifespan. For example, whereas preschool children could show rudimentary forms of prosocial behavior and empathy that are not determined by moral considerations and values (30, 31), adults could set long term goals, engage in signaling behavior, and endorse values that help guide behavior (2, 9) and shape the social environment (23, 24). Importantly, across levels of development low status should consistently increase prosocial behavior – the crucial adaptive strategy to low status positions proposed here.

Four studies tested the hypotheses that low status increases prosocial behavior, signaling of prosocial intentions, and benevolent life goals and values, and that the behavioral effects of status are already present in preschool children. In adults, status was manipulated by giving participants false feedback regarding their social prestige and reputation, using a variety of methods established in past research. In preschool children status was manipulated through ownership of a valuable resource that afforded prestige. Upon the status manipulations, participants were given the opportunity to help a person in need, report their life goals and values or interact in groups.

Study 1

Study 1 examined unsolicited helping behavior in adults. Participants were 44 undergraduate students (9 male; mean age was 20.30, *SD*=2.58). They were randomly assigned to the between-subjects condition status (high vs. low), by receiving false feedback regarding the ranking of their department, in terms of prospective professional prestige, in relation to other departments of the same university (see supplement for all methodological details). In the high status condition participants read an article with a table indicating that their department (i.e. Psychology) was ranked second among nine departments. In the low status condition their department was ranked eighth. Helping behavior was measured outside the laboratory after completion of cognitive tasks, and after the study had allegedly ended. The experimenter, who was unaware of the status conditions, pretended to accidentally drop a pack of 20 pens on the floor. The number of pens that participants helped pick up from the floor was counted as a measure of unsolicited helping behavior (32).

During what was allegedly the actual experiment participants completed a central executive task and a lexical decision task. Executive functions (i.e., cognitive functions that coordinate and manage information necessary for appropriate actions and planning; 33) are often compromised in chronic low status group members (e.g., ethnic minorities, women) particularly when their low status is salient (e.g., under stereotype threat; 15, 22). The cognitive strain of low status could accentuate the need to establish social bonds, and was therefore measured. The lexical decision task examined the accessibility of constructs related to sociality (aggressive, sociable) and agency (efficient, knowledgeable). After finishing, participants were dismissed, and the measure of helping behavior was taken outside the laboratory.

Results. Low status participants (*M*=14.45, *SDs*=1.43) helped the experimenter pick up significantly more pens from the floor than high status participants (*M*=11.68, *SD*= 1.99), *t*(42)=-5.31, *p*<.001, *d*=1.16. Enhanced prosocial behavior in low status individuals was not dependent on the accessibility of agency or sociability constructs, nor central executive ability. Nevertheless, similarly to chronic low status positions, momentary states of low status taxed central executive functions (*Ms*=18.91 vs. 17.76; *SDs*=1.19 vs. 1.58), *t*(41)=2.70, *p*<.05, *d*=.72. Status did not affect differentially the relative accessibility of agency and sociability, *F*(1,42)=.21, *p*=.64.

Study 2

Study 2 focused on behavior during social interactions with individuals of the same rank level. Past research has extensively examined the signaling of dominance and subordination, which occurs through open and expanded or constricted poses respectively (23). Such signaling has emerged as a strategy to avoid costly fighting and conflict escalation in agonistic encounters. Whereas dominance and subordination signaling are functional in dominance (i.e., power) based hierarchies, we reasoned that prestige based hierarchies would be associated with the signaling of prestige related and prosocial traits that serve the adaptive strategies of high and low status individuals, as they manage the impressions that others form of them. One strategy could consist in *costly signaling* (34) or the signaling of behavior that is costly to the self. Such behavior can increase the chances of being chosen as a sexual or coalition partner, and should be particularly relevant for low status individuals. By showing the wish to please others and sacrifice self-interest to benefit others, low status individuals could increase their perceived status and more easily form alliances. Such behavior can be seen in chronic low status groups.

For example, women, who typically occupy lower status positions in society than men, tend to smile more and signal more appeasement in social interactions than men (35). Furthermore, this tendency increases in times of threat (36).

The second strategy is associated with an emphasis on competence. High status is often afforded to those who are competent (37). To maintain their status positions high status individuals may signal competence. This may occur even if they are not necessarily more competent.

Status related behavior strategies could contribute in part to the emergence of stereotypes of high and low status groups. Disadvantaged social groups who do not compete for resources (e.g., the elderly) are often perceived in paternalistic ways: warm but not competent. In contrast, advantaged social groups (e.g., rich people) are perceived by society at large as competent, but often not warm (27). Stereotypes can in part be inductively learned from signaling behavior (38).

In Study 2, participants were assigned to a minimal high or a low status group, and were asked to complete a decision making task. They then introduced themselves to the group and engaged in a group discussion with same status partners. Participants were videotaped by hidden cameras, and the videotapes were coded by trained observers.

Status was manipulated using a minimal group paradigm. Participants performed a relatively meaningless visual task, and received bogus feedback about their group standing compared to another group. They first estimated the number of dots on displays (39), and were then randomly assigned into one of two perceptual styles (*figural* or *background*). They were informed that one style allegedly performs better than the other style on dot estimation tasks. Subsequently, participants completed an unrelated task in

which they read information about potential apartments and roommates and chose an apartment and a roommate. The roommates and apartments varied in number of positive and negative attributes, so that decision making quality could be measured (40). Participants were then invited to move and sit together with other participants of the same style, introduce themselves to the group and discuss their roommate preferences.

Results. Given the strong association between status, competence and warmth in the stereotypes held by society at large (27), we inspected whether status affected decision making quality as a proxy for competence, and whether this was related to prosociality. High status participants did not make better decisions compared to low status participants, $\chi^2(1, N = 82) = .78$, $p = .37$, nor did they differ in the types of attributes they preferred in roommates, $F(1, 80) = 2.49$, $p = .13$.

Four trained coders, who were unaware of status, rated group members on 14 attributes associated with social investment (e.g., *number of smiles*, *supportive, friendly, approachable*, *empathic, extrovert*), competence (*competent, knowledgeable*, *knows what he/she is doing*, *capable*), agency (*takes initiative, task oriented*) and self-enhancement (*signals high status*).*[1]

Results. The 14 attributes were subjected to a principal component analysis to identify status specific behavior signaling. This analysis revealed two factors accounting for 85% of the variance in the variables. †[2] One factor concerned communal and prosocial behavior, and the other competence, agency and the signaling of status.

Figure 1

[1] The average inter-rater reliability was $r = .73$ for the social and $r = .63$ for the competence dimensions.
[2] The group was the unit of analysis for variables assessed after the groups were formed.

As expected, type of signaling was dependent on status, $F(1, 11)=17.82$, $p=.001$, $\eta^2_p=.62$. High status participants scored higher on competence and agency ($M=.35$, $SD=.69$) than on prosociality ($M=-.31$, $SD=.67$), $F(1,11)=8.19$, $p<.001$, $\eta^2_p=.43$, whereas low status participants showed the reverse pattern ($Ms=-.32$ vs. $.36$; $SDs=.49$ vs. $.38$), $F(1,11)=16.41$, $p=.002$, $\eta^2_p=.60$. Crucially, low status participants displayed more prosocial intent than high status participants, $F(1, 11)=8.81$, $p=.01$, $\eta^2_p=.44$, and high status participants signaled more competence and agency than low status participants, $F(1,11)=4.85$, $p=.050$, $\eta^2_p=.31$. In summary, low status participants showed more communal and prosocial signaling during self-presentations and interactions with same status individuals compared to high status participants. In contrast, high status participants signaled competence, initiative, and elevated status. Competence signaling occurred even though high status participants did not make decisions of better quality regarding the topic under discussion compared to low status participants. The results of this study are noteworthy considering the minimalistic nature of status differences between the groups. They are consistent with research showing that high and low status groups have often ambivalent stereotypes of warmth and competence (27). The results point out that one reason for the prevalence of ambivalent stereotypes, thereby low status groups are often perceived as warm but not competent and high status groups as competent but not warm, could derive, among other factors, from inductive learning of actual behavior.

Study 3

Members of disadvantaged social groups (e.g., females and individuals with low income) endorse more benevolent life goals and values than their high status counterparts

(e.g., males and individuals with high income; 2, 3, 9). Here we examined whether subtle cues of an individual's status position are capable of affecting values in a similar manner.

Low status individuals could strategically deploy prosocial behavior solely to attain a number of direct benefits for the self. These could include attaining status or favors driven by reciprocal altruism (41). Low status individuals could also aim at forming coalitions to outwit the higher echelons, a behavior that would be consistent with the Machiavellian intelligence hypothesis of cognitive evolution (26). Contrary to these claims we test the hypothesis that low status is associated with more altruistic motives, seen in life goals and values.

Values convey what is important in life (2, 9). They are desirable trans-situational goals that serve as guiding principles in life. Values motivate action and function as standards of comparison when making judgments about actions. Importantly, different values are not related randomly, some values are compatible and others are incompatible. In particular, power values, which reflect the desire to achieve social status, prestige and control over resources, conflict with self-transcendent values. Self-transcendent values reflect concerns with helping and nurturing others, as well as seeking justice and tolerance for all.

Values show some malleability and are susceptible to changes that serve adaptation to the environment (42). Subtle variations in status could change values in ways that serve status-specific adaptation. Specifically, we hypothesized that a low status position would increase self-transcendent values (universalism and benevolence) and decreased power values, whereas the opposite should be true for a high status position.

Status should also affect more concrete cognitive representations, specifically life goals. Life goals are contextualized intentions that can be considered at a middle level between values and concrete goals (43). We examined effects of status on the major seven life goals (economic, aesthetic, social, relationship, political, hedonistic and religious). We hypothesized that low status would be associated with the pursuit of professions that serve the community more than high status. Finally, we also explored whether status would affect the desire for offspring, as a form of social investment. Fertility is higher in low social classes and minorities (44, 45). Given the increased mortality in some of these groups, increasing the number of offspring would increase social capital, and could be used as a strategy to increase fitness (46).

Fifty undergraduate art students (11 males) were randomly assigned to a high or low status condition via false feedback regarding the prestige ranking of their school compared to a similar school. This information was conveyed in a bogus article that compared two schools of art. For half of the participants their school scored higher than the similar school (high status condition) in a national assessment exercise, whereas for the other half their school scored lower than that school (low status condition). Participants subsequently completed the major life goals questionnaire (43). The social domain entails prosocial goals: *helping others in need, working to promote the welfare of others* and *taking part in volunteer community and public service.* Participants also completed a short version of the universal, benevolent and power values subscales of the Schwartz Value Survey (47).

Desire for offspring entailed two questions: how many children participants plan to have, and how many they would like to have if they could, in their fantasy (from 0 to 6).

Results. High status participants endorsed more power values (M=.14, SD=.64) than self-transcendent values (M=-.18, SD=.64), low status participants endorsed more self-transcendent (M=.17, SD=.55) than power (M=-.13, SD=.62) values, $F(1,48)=8.74$, p=005, η^2_p=.15. Furthermore, low status participants endorsed more self-transcendent values than high status participants, $F(1,49)=4.21$, $p<.05$, η^2_p=.08, but did not differ with regard to power values. Status also affected prosocial life goals, $F(1,48)=5.44$, p=.02, η^2_p=.10, but not goals in other life domains. Low status participants set more goals for their lives that enhanced the welfare of others (M=5.39, SD=.92) compared to high status participants (M=4.65, SD=1.27).

Figure 2

Finally, even though temporarily induced status differences did not affect the actual number of children planned for the future, it affected the number of desired children, $F(1,47)=5.46$, p=.02, η^2_p=.10. Low status participants wished for more children (M=3.08, SD=1.32) than high status participants (M=2.20, SD=.93). Together, these results suggest that status has far reaching consequences for the organization of people' goals and abstract guiding principles. It affects life goals and values in ways that fit the adaptive priorities of high and low status individuals, with an emphasis on prosocial investment and increased social capital in low status individuals. These results suggest that the effects of status are not solely related to wanting to attain reciprocal immediate benefits for the self. Status affects individuals in more fundamental ways.

Study 4

An appreciation of the evolutionary origins of social behavior is aided by an understanding of how social cognition emerges in early development. Study 4 was designed to this end. It focused on preschool children, an age before abstract representations, such as values have started to form (which occurs at 7-8 years of age, 28). Hierarchies in children up to the age of 7 are based on coercion, and revolve around disputes about property ownership and other forceful behaviors (48).

The study utilized a paradigm designed to study dominance based hierarchies in nonhuman primates (49). This paradigm allows an examination of the prosocial correlates of individual differences in social status, as well as the effects of manipulated social status on prosocial behavior, without using high order symbolic means associated with adult hierarchies. Forty-eight participants (28 male) took part. Mean age was 4.7 (*SD*=.56). Two children of the same age and gender were presented with a valued and a non-valued toy, and asked to choose one each. The winner of the competition for the valued toy was considered the dominant child. To force a change in status children were regrouped in pairs two weeks later with a new partner of the same rank, constituting pairs of either two high status, dominant or two low status, submissive children. The pair competed again for the valuable toy, and new hierarchies emerged. Because dominance and empathy in preschool children have been related to cognitive functions (50, 51), and prosocial behavior often depends on moral reasoning (52), we measured the ability to inhibit dominant responses and moral reasoning. To measure helping behavior, children were given 5 stickers, and asked if they wish to donate any of these stickers to a child who is in hospital and has no stickers (52). Moral reasoning was assessed by asking

children to imagine themselves transgressing moral norms (e.g., stealing a bicycle), and asking them about whether the transgressions were right or wrong, and what were the emotions elicited in the self and other. Inhibition was measured with a modified Stroop task and a measure of distractor inhibition.

Results. Helping was dependent on status and time (T), $F(1,44)=4.30$, $p=.01$, $\eta^2_p=.23$. As expected, at T1 low status children donated more stickers to a child in need than high status children (*Ms*=1.17 vs. .37; *SDs*=1.57 vs. .71). Furthermore, losing status increased donations over time, $F(1, 11)=6.06$, $p=.03$, $\eta^2_p=.34$ (*M*T1 =.58 vs. *M*T2 =1.33; *SDs*=.90 vs. 1.43); whereas gained status had the reverse effect (*M*T1 =1.08 vs. *M*T2 =.33; *SDs*=1.44 vs. .65), $F(1, 11)=3.34$ $p=.09$, $\eta^2_p=.38$. Thus a manipulated change in status at T2 yield the same effects as dispositional status observed at T1. Nevertheless, for those who maintained the same status positions over time there was a normalization of helping behavior. When facing the same request, recurrent low status children helped more than recurrent high status children at time 1 (*Ms* 1.25 vs. .17; *SD*=1.76 vs..39) but the differences between these two groups became non-significant at T2, $F(1, 22)=.11$, *ns*.

Helping behavior was not related to differences in moral reasoning, distractor inhibition and cognitive control. Status did not affect moral reasoning and Stroop performance. There was a tendency for distractor inhibition to decrease over time for individuals who acquired power at T2, however, none of the pairwise comparisons were significant for this measure.

Discussion

Four studies demonstrated that status affects prosocial behavior in preschool children and adults. Preschool children, who dispositionally or situationally experienced

low status were more likely to help a child in need compared to those who experienced high status, even though helping was costly. Low status adults were more likely to spontaneously assist another person, and signal altruistic intent in interactions compared to their high status counterparts. In contrast, high status individuals were more likely to signal competence.

The prosocial behavior of preschool children was not associated with differences in moral reasoning. In adults, status permeated higher order mental representations, affecting values and the goals that individuals set for their lives, as well as their desire for offspring. Low status individuals planned for more professional careers that serve the community, and endorsed more benevolent and universal values compared to high status individuals. These findings are consistent with research carried out in natural settings (1, 2, 16). For example, feelings of superiority of one's group are associated with rightwing ideology, and the justification of right-wing motivated violence (53). Prestige differences could play an important role in such phenomena observed in social hierarchies.

Humans are a cooperative species, and humans' superior altruism appears early in ontogeny. For example, children as young as 3 years of age act more altruistically, sharing resources more equitably with conspecifics compared to chimpanzees (54). Research has started to unravel the nature of altruism in children. Altruism in preschool children has been understood as being largely determined by age. Some studies have, however, suggested that children's prosocial behavior is sensitive to contextual factors, such as reciprocity (55). Here we show for the first time that prosocial behavior in preschool children is influenced by chronic and situational status positions. This pattern of relations between social hierarchy and altruism occurred before children had acquired

literacy and complex forms of moral reasoning and social cognition, and before they had formed values that could guide behavior. These findings are consistent with the increased social investment found in low rank nonhuman primates (6, 7).

The findings occurred in association with varied situational cues indicative of relative interpersonal or intergroup prestige and reputation, including minimalistic cues. They point out the importance of social status in human social relations, and suggest that individuals have cognitive and motivational programs that they use flexibly to navigate a complex social world characterized by unstable status relations.

From a broader perspective, the ability to detect and act appropriately upon status cues could have been under evolutionary pressure, and have emerged to solve status related challenges. In particular, benevolence and affiliative behavior may have been an adaptive strategy for those in low status positions. In ancestral environments cooperative behavior has allowed humans better prospects in food gathering, mate opportunities and defense against challenges (56). In today's society, an investment in social relationships is positively associated with household food security, independent of household-level socioeconomic factors (57). Similarly, in nonhuman primates, such as baboons and chimpanzees, bonding behavior and the signaling of appeasement intentions increase reproductive fitness, and seem to have emerged as an adaptive strategy to deal with social threat (6, 37). Individual differences in bonding behavior positively correlate with life span in nonhuman primates (57, 58). Crucially, affiliative behaviors are amenable to social contextual influences, and increase in times of uncertainty both in nonhuman primates and in humans (6, 37).

In the present research status affected not only behavior but also long term goals and values systems that concern society at large. The heightened endorsement of benevolent values by low status individuals is inconsistent with the notion that low status individuals are solely motivated to cooperate in order to outwit their higher echelons in a competitive environment. Thus the present findings cast doubts on the Machiavellian intelligence hypothesis of cognitive evolution (26).

Values are communicated and shared, and can be used to exert social control. The values of low status individuals seek equality for all, and will contribute to create egalitarian cultures that treat all people as moral equals, committed to cooperate and show concern for everybody's welfare. Conversely, by endorsing power values those with high status will favor hierarchical cultures. Ultimately, both strategies reflect attempts of niche construction in the form of norms that govern social life.

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