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Evolution and the social psychology of leadership:

The mismatch hypothesis

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Abstract

This chapter advances an evolutionary perspective on leadership, arguing that leadership consists of a constellation of adaptations for solving different coordination problems in human ancestral environments, most notably pertaining to group movement, social cohesion, and intergroup relations. Our evolved leadership psychology influences the way we think about and respond to modern leadership, which creates the potential for a mismatch. This chapter provides some evidence for this mismatch hypothesis and notes some implications for leadership theory and practice.

Evolution and the social psychology of leadership:

The mismatch hypothesis

When Tony Blair stepped down as prime-minister of Britain in 2007 after ten years in office most British voters were glad to see him go. Despite his numerous contributions to reforms of the health care system, education, civil law, and government, he will be mostly remembered for his role in bringing peace to Northern Ireland and waging wars in Iraq and Afghanistan. Matters of life and death ultimately determine the fate of leadership. In times of crises, leaders give us comfort, hope, and a sense of direction and if they fail they must go.

Leadership failure is common in modern society. Scholars estimate a 60-75% failure rate in business and political leadership with sometimes dire consequences for the welfare of followers (Hogan, Curphy, & Hogan, 1994). Why does modern leadership fail so often and sometimes so spectacularly? There are many possible answers but we focus on one here. Perhaps the failure of modern leadership is a consequence of it being at odds with aspects of our evolved leadership psychology. In this chapter we argue that we have a natural way of thinking about and responding to leadership which is shaped by several million years of leadership experience. Yet because modern environments are so dramatically different from ancestral environments this creates the potential for a mismatch. This mismatch hypothesis can explain many counter-intuitive findings in leadership research with various implications for leadership theory and practice.

In this chapter we first discuss the possibility that leadership and followership might have ancient evolutionary bases, applying insights from evolutionary social psychology. With the help of comparative and ethnographic evidence we will then

hypothesize about what leadership may have looked like in ancestral times and how this might affect leadership in modern times, creating the possibility of a mismatch. We will review the mismatch hypothesis by considering several different domains of evidence from the social psychological literature on leadership. Finally, we note some implications of our mismatch hypothesis.

Evolutionary Social Psychology

Evolutionary social psychology has its roots in social psychology, evolutionary psychology, and evolutionary biology. Evolutionary social psychology (ESP) is based on the Darwinian assumption that human psychology is the product of evolution through natural selection in the same way that natural selection has shaped human physiology. Because the environment in which humans evolved was primarily social – humans are first and foremost a group living species (Dunbar, 2004) -- ESP proposes that the human mind is essentially social, comprising many functional psychological adaptations specifically designed to solve particular adaptive problems of ancestral group life. Tentative examples of such adaptations include theory of mind, social intelligence, language, laughter, sex-specific mating strategies, status sensitivity, coalition formation, reciprocal altruism, cheater detection, and, perhaps leadership and followership (Buss, 2005; Van Vugt & Schaller, in press). Individuals (or groups) with these capacities would have been better equipped to extract fitness (reproductive) benefits from group life, allowing these psychological mechanisms to spread and reach fixation in the population.

Obtaining evidence for psychological adaptations requires making inferences about our ancestral past, which is painstakingly difficult. Barring the unlikely invention of a time machine, it is impossible to collect behavioral data in ancestral environments or to empirically track the actual evolution of any alleged psychological

adaptation. Instead, evolutionary social psychologists must rely on a multitude of other, more indirect sources of evidence (Schmitt & Pilcher, 2004). Some of these methods – such as the experiment and survey, the standard methods of social psychology, – are familiar to most leadership researchers. Many are probably also familiar with mathematical models and computer simulations of social interactions and these methods are an important tool in evolutionary psychological inquiries (Van Vugt, 2006). A third form of evidence emerges from recent advances in neuroscience. Brain imaging studies, for instance, have to the potential to provide data attesting to specific physiological structures associated with specific kinds of social cognition and behavior (Adolphs, 1999). Anthropological and ethnographic databases provide a fourth important kind of evidence, testing the extent to which specific kinds of social phenomena are universal across human cultures, including modern hunter-gatherer societies that most closely resemble ancestral group living. Finally, cross-species evidence is instrumental in testing speculations about the evolutionary history of any alleged adaptation (Van Vugt, De Cremer, & Janssen, 2007).

The Mismatch Hypothesis

What about evidence from modern environments? Although current reproductive success might be informative in some cases there are particular dangers in using this as criterion for psychological adaptations. Remember that human psychological mechanisms evolved because they produced fitness benefits in ancestral environments. Because evolution is a slow, cumulative process such mechanisms might no longer be adaptive in modern environments particularly if these environments are a great deal different. This could apply particularly to humans because our environment has changed dramatically in the last 10,000 years or so, since the agricultural revolution (Diamond, 1997). This led some evolutionary

psychologists to conclude that we have “Stone Age-minds on a modern information highway” (xxxx). This is perhaps no exaggeration. Fossil evidence indicates that human brain size has remained remarkably stable for at least the last 200,000 years (Dunbar, 2004).

The discrepancy between modern and ancestral environments potentially creates a mismatch between aspects of our evolved psychology and challenges of modern society and this may have substantial implications for a range of social psychological processes such as leadership.¹ We can illustrate this with two examples from human psychology that can be interpreted as evidence for the mismatch hypothesis. One classic example is the fear of snakes and spiders, which were common threats for humans in ancestral environments. Yet in modern societies like the US they kill less than 20 individuals per year, most of whom are owners of dangerous snakes and spiders. In contrast, car accidents kill about 40-50,000 people a year (National Safety Council, 2000). Yet decades of research has shown that fear of snakes and spiders is more readily learned than fear of contemporary more lethal dangers such as cars, guns, or electrical appliances (Ohman & Mineka, 2001).

Another example of a mismatch is trust in strangers (Hagen & Hammerstein, 2006; Johnson et al., 2003). There is a considerable body of laboratory evidence that people readily cooperate with anonymous strangers in one-shot interactions (De Cremer & Van Vugt, 1999). This defies rational logic. People are not supposed to be unselfish in anonymous exchanges because their altruism might be exploited.

¹ Mismatch theory is an evolutionarily informed concept. It applies to all organisms possessing traits (including behavioral, emotional, and biological) that have been passed down through generations, preserved by natural selection because of their adaptive function in a given environment. However, the given environment of the evolutionary period is quite unlike the current environment. Therefore, traits that were at one time adaptive in a certain environment, are now "mismatched" to the environment that the trait is currently present in.

However, one-off encounters with complete strangers were presumably very rare for ancestral humans because they mostly interacted with family members, and therefore humans might not have evolved the cognitive machinery to deal with novel situations such as these. Interestingly, research shows that people are more likely to trust strangers if they look or behave “familiar”, for instance, sharing the same facial features, speaking the same dialect, or wearing the same clothes (Park, Schaller, & Van Vugt, 2007). This mismatch may have potentially maladaptive consequences particularly for individuals with altruistic dispositions.

Before we address the implications of this mismatch hypothesis for modern leadership theory and practice we must first discuss the role of leadership in ancestral environments.

Evolutionary Origins of Leadership

The human species is estimated to be 2 to 2.5 million years old. For most of this period, humans lived in small kin-based bands in savannah-type environments (Dunbar, 2004; Johnson & Earle, 2000). These family-level groups were presumably connected to others, forming clans and tribes that came together at seasonal gatherings for the purpose of exchanging mates, goods, and information (Richerson & Boyd, 2006). For ancestral humans, group life was an essential strategy to survive in a hostile environment in which predation was high and resources were scarce (Foley, 1997). Collective action in the form of hunting, sharing food, and defending the group would provide a buffer against these threats. This presumably created a niche for leadership to organize group activities (Van Vugt, 2006). For instance, in planning a hunt groups must decide who will join the hunting party, where they will go, when they go and when they return. Such decisions create coordination problems and these can be better solved if an individual coordinates the group-decision making process.

In a previous paper (Van Vugt, Hogan, & Kaiser, 2006) we have identified three ancestral coordination problems for which leadership would have been critical, that is, group movement (e.g., hunting), group cohesion (e.g., breaking up fights), and intergroup politics (e.g., warfare, peacemaking).

Chimpanzee Evidence

The phylogenetic evidence suggests that pre-adaptations for these leadership roles can be found among other social species including in our closest genetic relative, the chimpanzee, with whom we shared a common ancestor approximately 5-7 million years ago. Wild chimpanzees live in fission-fusion societies of around 30-50 individuals in a large territory. They frequently form coalitions with each other for activities like hunting and foraging, internal politics and protecting territory boundaries and leadership is prominently displayed in these situations. Frans de Waal of Emory University has written some marvellous books on chimpanzee politics and part of the appeal of his work lies in the fact that we can recognize ourselves in the descriptions of our cousins. For instance, DeWaal (1996) describes an incident from Arnhem Zoo (the Netherlands) in which the alpha male executes leadership in breaking up a group fight:

“A quarrel between Mama and Spin got out of hand and ended in fighting and biting. Numerous apes rushed up to the two warring females and joined in the fray. A huge knot of fighting, screaming apes rolled around in the sand, until Luit [the alpha male] leapt in and literally beat them apart. He did not choose sides in the conflict, like others; instead anyone who continued to act received a blow from him” (p. 129).

Another primatologist, Chris Boehm, has documented evidence for leadership in interactions between two wild chimpanzee communities in Gombe National Park (Tanzania):

“Goblin [the alpha] moves forward quickly to a vantage spot to peer across the valley and Mustard now emulates him. As Goblin (number one), Satan (number two), and Evered (number three) scan the valley, they break off several times to look at one another quickly. After nearly 60 seconds, Goblin suddenly makes his decision and begins to vocalize and display. The entire group, which includes adolescents Freud and Beethoven, immediately follows suit and the result is the usual one: Both groups vocalize and display ferociously then slowly retreat into their home ranges” (p. 28).

Environment of Evolutionary Adaptedness

The scale and complexity of leadership increased with the arrival of early humans some 2 million years ago. This period marks the beginning of the Pleistocene period which ended about 13,000 years ago with the agricultural revolution. This period is sometimes referred to as the Environment of Evolutionary Adaptedness or EEA for humans (Foley, 1997).² Modern hunter-gatherer societies such as the !Kung San of the Kalahari desert, the Shoshone of the American Great Basin, the Yanomamo of the Amazon river basin, the Inuit of the Arctic coasts, and the Aborigines in Northern Australia provide the best model we have for human social organization in this stage

Extrapolating from this evidence, conditions in the EEA were fundamentally egalitarian and there was no formal leadership. There were Big Men, often the best hunters or warriors in the band, who could exercise relatively more influence on group decision-making within and sometimes even outside their domain of expertise, but their power was severely curtailed (Chagnon, 1997; Diamond, 1997; Johnson &

² The term *environment of evolutionary adaptedness* refers to the environment to which a particular evolved mechanism is adapted. Evolutionary psychology proposes that the majority of human psychological mechanisms are adapted to reproductive problems frequently encountered in Pleistocene environments in which humans spend 95% of their history. These problems include those of mating, parenting, social coordination and cooperation.

Earle, 2000). If Big Men attempted to dominate group discussion, this would prompt fierce resistance from the rest. Anthropologists talk about a reversal of the dominance hierarchy to indicate that, unlike in nonhuman primates, leaders are being dominated by subordinates who have various strategies in place, so-called levelling mechanisms, to control them (Boehm, 1999). For instance, to keep overbearing leaders in place they can use gossip, ridicule, criticism, ostracism, and the threat of punishment and sometimes even assassination (Boehm, 1993). Across time these levelling mechanisms gave rise to a highly democratic and participatory decision-making process in which dominance relationships--a legacy of our primate past--were replaced by consensual leader-followership relations (Van Vugt, Hogan, & Kaiser, 2007).

We believe that the EEA reflects our natural way of thinking about and responding to leadership with substantial implications for modern leadership theory and practice. If humans are mostly adapted to Pleistocene environments this means that some aspects of our evolved leadership psychology may not be very well adjusted to modern environments. Since the agricultural period there has been a steady increase in the size and social complexity of societies. Simple band structures have been replaced by complex social structures of chiefdoms, kingdoms, states, nations and modern businesses in which thousands or even millions of people must live and work together peacefully. This creates leadership challenges to which our evolved leadership psychology may not be very well adjusted. Hence, we have to work with or work around the constraints of our innate leadership psychology in the design of our institutions.

Evidence for the Mismatch Hypothesis

In this penultimate section we review the evidence for the mismatch hypothesis by focusing on eight different aspects of leadership that are still affected by our evolved leadership psychology with sometimes negative implications for leadership practice.

1. The Prototype of Band Leadership

Since humans evolved in small scale societies without any formal leadership structure and near-equal power relations between (adult male) group members this should be reflected in the way modern humans evaluate leadership. In particular, we predict there should be universal agreement on what followers regard as positive leadership qualities and these qualities should closely match the prototype of band leadership.

The GLOBE-project data are useful to test this hypothesis (<http://www.thunderbird.edu/wwwfiles/ms/globe/>). In a study of leadership in 61 cultures GLOBE-researchers found strong evidence that some leadership attributes are universally regarded as positive. Examples of positive leader attributes are integrity—good leaders can be trusted; diplomatic—good leaders operate with tact; fairness—good leaders are fair and generous; decisiveness—good leaders make sound decisions for the group; intelligence and competence—good leaders contribute to the group's performance; and, finally, vision—good leaders are inspirational (Den Hartog et al., 1999; see also Epitropaki & Martin, 2004; Hogan & Kaiser, 2005; Lord & Maher, 1993). These leader prototypes closely match the perception of good Big Men in traditional societies (Boehm, 1993; Johnson & Earle, 2000; Sahlins, 1963). In order to be influential a Big Man must be competent in a particularly valued domain, be modest about his achievements, have the interests of the group close at heart, and be persuasive.

2. Dominance is the Anti-thesis of Leadership

An important aspect of leadership in traditional societies is that one group member cannot order other members to do something they do not want to do. Individuals in hunter-gather societies are fiercely autonomous and it is quite common for them to ignore or disobey their leader. The anthropologist Freeman (1970) reports that the rank and file simply ignore Philippine chiefs who issue commands as opposed to making suggestions. This can be effective because in this way leaders are sanctioned without necessarily being replaced—which may cause disruption to group unity. When someone becomes too bossy, the group can always “vote with their feet” and leave the leader behind which has been observed among the Bedouins, a nomadic tribe in North-Africa. Moore (1972) reports that, when an aggressive tribal leader starts a feud, the other tribesmen declare that the leader is no longer one of theirs. This allows rival groups to kill him at will, because the group will no longer defend him.

Thus we should expect a universal aversion against bossy, self-centered leaders in modern environments. Again, the GLOBE project data support this. Dominance and selfishness are universally regarded as negative leadership attributes (Den Hartog et al, 1999; Epitropaki & Martin, 2004; Hogan & Kaiser, 2005). This creates the potential for a mismatch. In modern organizations leaders often do not emerge from a consensual group process (like in Big Men societies) but they are often imposed on groups. This process selects for other types of qualities and therefore we sometimes find examples of leaders and managers who are the anti-thesis of good leadership (Hogan et al., 1994).

3. Leadership is about Prestige

In hunter-gatherer societies who gets to lead is determined by their ability to help the group move towards specific goals. For instance, the best hunter exercises

more influence on hunting decisions and the best warrior on warfare decisions. They attain leadership status through leading-by-example. This puts leadership firmly within the domain of prestige (Henrich & Gil-White, 2001). Prestigious individuals attract followers because staying close to the leader enables them to imitate the leader, thus learning the trade of being a good hunter or warrior.

This prestige aspect of leadership is echoed in modern life to sometimes detrimental effect. In the world of business, politics and leisure, individuals who have shown great expertise within a particular task domain are more likely to be endorsed as leaders or managers. Low task ability often automatically disqualifies people from certain leadership positions (Palmer, 1962). This might not be so effective in modern complex environments, however, because the tasks of leaders are arguably more complex, involving aspects of coaching, management, finance, report writing etcetera. Thus there is the potential for a mismatch. A good example is sports. In competitive team sports like football (soccer) the best players often get a lot of prestige and this gives them an edge in the competition for management jobs when they retire. Yet there is not much evidence to suggest that good players make good managers. Quite the contrary, some of the best managers in English football--Ferguson at Manchester United, Wenger at Arsenal, Mourinho at Chelsea F.C--were mediocre football players themselves and began their management career at an early age.

4. Leadership in Intergroup Conflict

In traditional societies an important function of leadership is to manage relations with other groups. Forming alliances with other bands and clans is essential for exchanging goods and mates and for defending territories against rival outgroups. Raiding and warfare are indeed common threats with potentially devastating consequences in small scale societies (i.e., losing 2 of 10 adult male warriors affects

the viability of a band) but the benefits of a raid can also be substantial and may sometimes outweigh the risks (i.e., gaining two extra reproductive females). In societies that frequently experience intergroup conflict, such as the Yanomano in the Amazon Basin, we see evidence of a more authoritarian leadership structure where the Big Men role is occupied by a fierce warrior (Chagnon, 1997). This is not really surprising. Intergroup conflicts require groups to act cohesively and some degree of coercion from the leader, for instance, against reluctant fighters might be necessary and tolerated by the rest of the group (O’Gorman, Van Vugt, & Henrich, 2007).

The intergroup aspects of leadership still play a role in modern society with sometimes devastating consequences because the scale of warfare has grown dramatically. There is some evidence for changing leadership perceptions during intergroup conflict, which could be explained by aspects of our evolved leadership psychology. For instance, during an intergroup threat groups prefer to elect ingroup leaders above more competent external leaders (De Cremer & Van Vugt, 2002) and leaders are known to strengthen their power base by starting an intergroup conflict (Rabbie & Bekkers, 1978). Intergroup threat also increases the support for prototypical leaders who share the norms and values of the group (Hogg, 2001). In analyzing the US-presidential elections McCann (1997) discovered that at times of crisis Americans voters were more supportive of a hawkish president.

This creates the potential for a mismatch. Although it may have been adaptive form small scale societies to endorse a more aggressive leader at times of war this might not be the case anymore because the consequences of modern warfare are so much larger. Also remember that leadership was essentially situational and once the threat had gone this person lost their influence. However in modern environments

leadership positions are often formalized and once the threat is gone, societies may be stuck with these leaders for a long time.

5. Separating the Person from the Role of Leader

Another implication of the mismatch hypothesis is that modern humans may have difficulties in separating the role of the leader from the person occupying the role. Extrapolating from the hunter-gatherer evidence, there were no formally recognized leadership roles in ancestral times and there was no distinction between people's private and public lives. In fact, people's personality and their personal norms, values, and ambitions were critical in determining whether they should get the chance to lead the group because this was the only information available. In modern society we are quite aware that, for instance, middle-level managers have only limited influence because they are following orders of senior management. Because our psychological machinery is not very well adapted to these complex multi-layer hierarchies, we automatically make trait inferences whenever we see a leader act in a certain way. This process is akin to what has been labelled as the leader attribution error (Hackman & Wageman, 2005) and might well be an aspect of our evolved psychology.

6. Odd Correlates of Leadership

Our mismatch hypothesis might also explain why leadership correlates consistently with seemingly irrelevant factors like age, height, weight, and health (Bass, 1990). Current leadership theories cannot satisfactorily explain these correlations and tend to see them as spurious (Bass, 1990). Yet in ancestral environments making a bad leader choice was potentially so costly that any significant beneficial personal trait would be taken into consideration. For instance, the possession of some piece of specialized knowledge would have been extremely

useful, like knowing about a long-forgotten waterhole in case of a drought (Boehm, 1999). This knowledge was more likely to be held by older, more experienced individuals, and age should therefore correlate positively with prestige and leadership.³ In modern society, the relation between age and leadership is still observed in professions that require a considerable amount of specialized knowledge like science, technology and arts (Caldwell & Wellman, 1926).

For leadership activities requiring physical strength and stamina, like organizing a group hunt or engaging in warfare, our ancestors would presumably pay attention to indices of physical health and someone's height, weight, and physical health might have been important markers. The mismatch hypothesis offers an explanation for these "fluke" correlations. Although the physical aspects of modern-day leadership are less important it still matters a great deal in the perception of leadership. There is evidence that the health status of candidate presidential leaders is crucial in determining the election outcome and therefore any negative information is not likely to be revealed (Simonton, 1994).

7. Gender and Leadership

Our mismatch hypothesis might explain why male leadership is still the norm in modern societies. In hunter-gatherer societies, leadership often includes a strong physical element, for example, leading a group hunt, organizing a raid on another group, intervening in a group fight. Given the obvious physical differences between men and women this might have increased the chances for men to emerge as leaders. In addition, given the different reproductive interests of men and women (simply stated as differences in the quantity vs. quality of matings) it is likely that for men group status would have been an important predictor of their reproductive success.

³ Group movement in nomadic species like baboon and elephant is indeed often decided by the older troop members (Dunbar, 2004).

Evidence from traditional societies like the Yanomamo suggests a link between male status and number offspring (Chagnon, 1997). An important way to enhance one's status in the group was to get prestige, for example, through exercising leadership functions. Thus, the evolved difference in status sensitivity between men and women might also explain why there still is a preponderance of male leaders.

It remains to be seen how adaptive this male leadership bias is in modern society in which the physical aspects of the job are less important. There is reliable evidence that women possess better verbal memory, empathy, and communication skills than men (Van Vugt, 2006). Hence they should in principle perform better as leaders in situations in which these skills are important. Other studies (Eagly & Johnson, 1990) suggest that women adopt a more democratic leader style than men, which again might be a bonus in many group situations (with the exception of an immediate crisis which requires more autocratic leadership). Yet this male bias may be difficult to eradicate. Some evidence suggests that when women and men are work together on a group task, the men are quicker to take on the leadership role even if the women is better qualified for it (Mezulis, Abramson, Hyde, & Hankin, 2004). Men are also more likely to take on leadership roles when being observed by women, regardless of their leader qualities, presumably because leadership is associated with status rewards (Campbell et al., 2002).

8. The Importance of Charisma

A final example of a potential mismatch is the role of charisma in modern leadership. Research on traditional societies suggests that Big Men are often extremely charismatic (Johnson & Earle, 2000). Being inspiring, persuasive, and visionary would indeed have been important attributes of aspiring leaders in small face-to-face groups. In modern organizations it is extremely hard to get the same

levels of intimacy between leaders and followers. Yet even in large bureaucratic organizations we still expect from leaders that they adopt an inspirational and personalized leadership style and such leaders tend to be more effective (Burns, 1978; Bass, 1985). The media obviously plays an important role in reducing the distance between leaders and followers. Yet this creates opportunities for charismatic leaders to exploit their influence on followers to sometimes devastating effect (e.g., Hitler).

Final Conclusions

In this chapter we have argued that modern leadership is influenced by different aspects of our evolved leadership psychology, which has been shaped by several million years of living in small scale societies. Because modern organizations are much larger and socially more complex, this creates the potential for a mismatch. We have reviewed several fields of leadership research that are consistent with this mismatch hypothesis. We do not believe that there is currently a better model to explain the diversity of empirical findings. Our ancestral leadership psychology is still influencing modern leadership but we are not arguing that this is the only influence. Evolution has given humans a great deal of flexibility to adapt successfully to novel environments and this is why we can function in societies that are socially much more complex than ancestral groups. Yet it is our conviction that organizations fare better if they can work around the limitations imposed by our evolved leadership psychology. Some modern organizations, like GoreTex, Virgin, and ABB, are doing this quite successfully. They mimic aspects of band leadership by devolving substantial responsibility to managers far down the chain of command so that the actual unit size does not exceed that of a hunter-gatherer band.

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