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Charisma as signal: An evolutionary perspective on charismatic leadership☆

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ABSTRACT

We present an evolutionary perspective on charismatic leadership, arguing that charisma has evolved as a credible signal of a person's ability to solve a coordination challenge requiring urgent collective action from group members. We suggest that a better understanding of charisma's evolutionary and biological origins and functions can provide a broader perspective in which to situate current debates surrounding the utility and validity of charismatic leadership as a construct in the social sciences. We outline several key challenges which have shaped our followership psychology, and argue that the benefits of successful coordination in ancestral environments has led to the evolution of context-dependent psychological mechanisms which are especially attuned to cues and signals of outstanding personal leadership qualities. We elaborate on several implications of this signaling hypothesis of charismatic leadership, including opportunities for deception (dishonest signaling) and for large-scale coordination.

Introduction

One of the most fascinating aspects about the concept of *charisma* is that it has managed to retain the aura of mystery – and even the supernatural – which it was intended to convey when the term was first coined over two millennia ago. Historically, charisma was attributed primarily to royalty or religious leaders, who were thought to possess divinely granted gifts, enabling their followers to achieve exceptional or supernatural feats. The power of charisma made it possible for generals to lead armies that could conquer nations, or for priests to inspire believers to construct monumental structures that would take the work of generations to complete. In modern lay terms charisma has become more down-to-earth: typically understood as a personality trait related to charm, magnetism, or likeability (Beyer, 1999). It has become a key part of the vocabulary with which we describe others, perhaps most often applied to the politicians, celebrities, and athletes who act as leaders in our modern society.[1] In the realm of politics, for example, elections may be won or lost according to whether a candidate can project the kind of charismatic appeal that convinces voters they are the kind of leader they'd "like to have a beer with."

Moving past its origins and semantic fuzziness, however, one encounters an enormous literature devoted to the task of

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[1] To stretch the meaning even further, conservationists also leverage the appeal of "charismatic species" such as the panda to garner support for their cause – rightly judging that images of the naked mole rat are less likely to stir the emotions of the masses.

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conceptualizing charisma - an increasingly popular topic of investigation in both the scientific literature and management journals over the course of the last few decades (Antonakis, Bastardoz, Jacquart, & Shamir, 2016; Lowe & Gardner, 2001; van Knippenberg & Sitkin, 2013). The present article will attempt to engage with the concept of charisma within the boundaries established by this literature – though suggesting places where it may be expanded or areas which may have been overlooked. However, it is important to keep in mind that this discussion takes place within a larger context. The more narrowly one defines charisma the more it appears to be reducible to an interesting scientific puzzle for psychologists to unravel, or a management skill through which corporations can increase their bottom line, but it would be a mistake to underestimate its relevance to society as a whole. In fact, as our population continues to expand and our susceptibility to charismatic leaders shows no signs of diminishing, it seems inevitable that more attention will need to be given to the question of how some individuals are able to achieve such extraordinary influence over others – and whether or not something needs to be done about it.

The concept of charisma has long historical roots – dating back to the Greek word *charis* meaning charm, beauty or allurement (Maclachlan, 1996) – but its exact meaning has been subject to debate ever since. In the scientific literature, these often take the form of active critiques and review articles, but they also develop in parallel, with researchers approaching the topic with different assumptions and from different theoretical perspectives. This opens up increasingly large divisions between disciplines that make the idea of conciliation – and, presumably, a comprehensive understanding of charismatic leadership – elusive. This is by no means unique to the field of leadership studies, as evolutionary psychologists Cosmides, Tooby, and Barkow (1992) point out:

"Every field has holes and gaps. But when there are causal links that join fields, the holes that exist in one discipline can sometimes be filled by knowledge developed in another. What the natural sciences have discovered is that this is a process with positive feedback: The more that is known – the more that can be simultaneously brought to bear on a question the more that can be deduced, explained, and even observed."

For the scientific method to function properly, researchers must come to a consensus regarding how to define a construct such as charisma so that others can work under the same operationalization, challenge any unproven assumptions, and replicate the results of experiments. It is here that the current lack of conceptual clarity becomes problematic, because ultimately a satisfactory answer to the question "what is charisma?" should take the form of an empirically testable theory that can (1) explain how and why certain individuals emerge as charismatic leaders while others do not, (2) make falsifiable predictions about the effects of charismatic leaders on followers, and (3) identify the underlying functions, processes, and psychological mechanisms on which it relies.

The primary aim of this paper is to highlight some of ways in which our current knowledge of charismatic leadership can be clarified by adopting the perspective of evolutionary psychology (van Vugt, Hogan, & Kaiser, 2008), in particular evolutionary signaling theory (Maynard Smith & Harper, 2003). We begin with a targeted review of those areas that have been identified by ourselves and others (Antonakis et al., 2016) as the most significant challenges. We identify theoretical and methodological issues which cast doubt on the utility of many of the observations, experiments, and interventions that can be found in the existing literature, and how the tension between the many competing approaches has given rise to a proliferation of different approaches to its study. Finally, we highlight some of the advantages which result from defining charismatic leadership as a signaling process (Spence, 1973; Jacquart & Antonakis, 2015), and point out several key areas in which the conceptualization of "signals" employed by economists and game theorists can be clarified and augmented with insights from the literature on signaling in evolutionary biology (Maynard Smith & Harper, 2003).

Understanding charisma

Although the term *charisma* dates back to antiquity, the modern resurgence of interest in the study of charismatic leadership is typically credited to the theories of sociologist Max Weber, who described it as one of the three sources of authority which exert the most powerful influences on society (Weber, 1947). He characterized the charismatic form of leadership as being primarily driven by a belief in the unique and exceptional qualities of one particular individual, and suggested that the rise of such individuals was often associated with rapid and radical changes. For Weber, the power of charismatic leadership, and the "authority" which such figures are granted – could be best understood at the societal or institutional level. Weber's theory has since been expanded upon by numerous researchers seeking to draw a causal link between attributions of charisma to particular individual leaders and broader, societal-level factors, such as the perception of external threat or internal crises (e.g. Jermier, 1993; Spencer, 1973). For the purposes of the present article we will not attempt to reiterate the long history of the scientific study of charisma – there remains very little to say that has not been covered in the exhaustive critiques already published in the management and leadership literatures (cf Antonakis et al., 2016; van Knippenberg & Sitkin, 2013; Yukl, 1999). It is perhaps enough to say that since Weber, scholars in numerous fields have continued to adapt and refine the various theories of charisma, and to make additions to the broader body of empirical observations from the vantage points of their own disciplines.

As with all scientific traditions, researchers and disciplines vary in how they conceptualize a construct as complex as charisma, and its meaning is often determined by the specific assumptions they hold, the importance they place on its various components, and the goals they hope to achieve in their research program (Heusinkveld, Benders, & Hillebrand, 2013; Hempel, 1965). Thus, theories tend to differ in the emphasis they place on one or more of these various components, oftentimes because the reputation of a particular researcher or publication causes them to go in or out of "fashion" (Bort & Kieser, 2011). In the leadership literature, these can be broadly categorized into four main areas of inquiry: (1) *individual traits*: a set of unique skills and abilities possessed by a particularly charismatic leader (e.g. Judge, Piccolo, & Kosalka, 2009; Foti & Hausenstein, 2007), (2) *follower behaviors*: how and why followers are motivated to seek out such leaders and grant charisma to them as a result (e.g. Meindl, Ehich, & Dukerich, 1985), (3) *organizational or contextual influences*: the degree to which leaders interact with the needs and goals of followers and organizations (e.g. Avolio & Gardner, 2005) and (4) *outcomes*: linking leader charisma to measures of success such as increased team productivity or

job satisfaction (e.g. Lowe & Gardner, 2001; Pillai et al., 2003). Ideally, these various approaches would tend to move closer to one another over time, eventually coalescing into something resembling the shared knowledge base found in physics or biology.

Unfortunately, we have yet to converge on a "Standard Science Model" of charismatic leadership. Here we argue that an evolutionary perspective represents the most likely means by which these different branches can be brought closer together. This is primarily because evolutionary theory provides a framework for describing both *how* charisma works and potentially *why* charismatic leadership has been selected for over the course of human evolutionary history. Using the knowledge we have of the conditions in which early human societies evolved (Johnson & Earle, 2000), as well as the kinds of recurrent challenges that leadership and followership appear best suited to solve, our approach can help to explain (1) when followers tend to direct their attention toward potential leaders in the first place, (2) how our evolved heuristics make it more likely that groups will converge on a particular solution to a coordination problem, and (3) why charismatic leaders are particularly adept at enabling rapid and efficient coordination within large groups (Spisak, O'Brien, Nicholson, & van Vugt, 2015).

Shortcomings of prior approaches

As we have outlined above, it is not unusual for the meaning of a scientific concept like charisma to shift and change over time, as researchers borrow, modify, and add to the definitions proposed by their predecessors (cf. Bass, 1985; Conger & Kanungo, 1987; House, 1977). However, this does become problematic when it leads researchers to continually "reinvent" charisma rather than directly engaging with the definitions proposed by other researchers. The various lenses through which charismatic leadership has been studied range from primarily theoretical approaches such as social identity theory (Shamir, House, & Arthur, 1993), to more empirical traditions such as the Multifactor Leadership Questionnaire (Bass, 1985) which have come to dominate the study of charismatic leadership in organizations (e.g. Antonakis, Avolio, & Sivasubramaniam, 2003). In between have been a number of "hybrid" theories such as those proposed by House (1977) and Jacquart and Antonakis (2015), which aim to bridge this divide. However, over the past few years there has been a growing concern among researchers that unless these different approaches can be integrated – at both the theoretical and operational levels – the field as a whole may be approaching a dead-end.

We agree that there is no compelling reason for conserving the overly complicated and competing theoretical explanations of charismatic leadership theory as they currently exist. To do so requires an unnecessary amount of tinkering, readjustment, and a lack of parsimony that does not appear to be justified by the merits of any one of these various formulations or approaches. Instead, as more insights and tools from a variety of disciplines, including the biological, cognitive, and neurosciences are added to our conceptual toolbox, the core concept of charisma will become clearer, opening up the possibility for consilience (Wilson, 1998). With this in mind, rather than reiterate the various shortcomings which have been identified and comprehensively addressed in recent reviews (e.g. Antonakis et al., 2016; van Knippenberg & Sitkin, 2013) our aim in this article is to show what unique contributions an evolutionary perspective can make to understanding charismatic leadership.

An evolutionary perspective on charismatic leadership

Evolutionary Leadership Theory provides a unified theoretical framework for understanding leader-follower relations as fundamentally arising from repeated selective pressures to make individually and collectively beneficial decisions in situations requiring coordination – such as hunting, warfare, group movement (van Vugt et al., 2008). It provides a solid theory from which to draw predictions, and opens up a larger "toolbox" which researchers can utilize to test competing hypotheses about leadership emergence, ranging from anthropological data (e.g. Bowles, 2009; von Rueden & van Vugt, 2015) to agent-based simulations (e.g. David-Barrett & Dunbar, 2012; Sharpanskykh & Spisak, 2011), to models drawn from economics and game theory (Hooper, Kaplan, & Boone, 2010; Tooby, Cosmides, & Price, 2006). This framework provides a vocabulary broad enough to encompass the wide spectrum of theories about the nature of leadership in general, but also allows us to narrow in on those aspects which make charismatic leadership unique.

In section An evolutionary perspective on charismatic leadership, using concepts drawn from the evolutionary biological literature, we categorize previous approaches to understanding charisma according to the level of analysis they address – that is, whether they provide *proximate* or *ultimate* explanations. In section The leader index we outline a model, and clarify the meaning and roles of various *correlates*, *cues*, *and signals* which serve as inputs into our evolved followership heuristics. These are the mechanisms which we propose have allowed humans to achieve the rapid and large-scale coordination necessary for our species' transition from the small-scale societies of antiquity to the globe-spanning civilizations we find ourselves in today (Kenrick, Li, & Butner, 2003; Sober & Wilson, 1998; von Rueden & van Vugt, 2016).

Next, in section An evolutionary signaling perspective on charismatic leadership we propose a definition of charisma and highlight its possible adaptive benefits by drawing attention to an often-overlooked coordination problem, referred to as the "Stag Hunt" game by game theorists, which provides a possible model for the evolution of charismatic leadership in humans. Finally, in the Discussion section we discuss implications of the charismatic signaling hypothesis, identify key questions which remain unresolved, and propose avenues for future research.

Ultimate versus proximate explanations

As a first step, we believe it is important to draw a clear distinction between theories which attempt to explain the *how* of charisma (e.g. How does charisma arise? How does it enable some individuals to influence the behavior of others? What are the underlying

mechanisms?) and the *why* of charisma (e.g. What, if any, is the evolved function of charisma such that it contributed to the survival and reproductive success of ancestral humans?). In the biological sciences, the former are commonly labeled *proximate* explanations whereas the latter are referred to as *ultimate* explanations.

This approach toward understanding a particular trait or behavior is generally attributed to the 20th-century ethologist Nicholas Tinbergen, whose thinking was in turn profoundly influenced by the debates which took place in biology following the widespread acceptance of Darwin's theory of evolution by natural selection. At the time, some of his contemporaries – eager to incorporate Darwin's new and exciting ideas – had begun to move away from the meticulous note-taking and observation which had typically characterized their discipline and to propose increasingly speculative and often unscientific explanations for why animals behaved the way they did (Buller, 2005). Tinbergen, however, was able to synthesize these two trends by recognizing that the wealth of empirical observations gathered by generations of field researchers were only the first step toward a complete understanding. These observations about *causation (*i.e. the specific stimuli which produced the behavior) and *ontogeny* (i.e. how the organism or behavior developed over time) constituted what he termed a *proximate* explanation. Tinbergen's great realization was that once these first two causes had been sufficiently understood, it was then possible to make informed hypotheses about a behavior's *survival value* (i.e. it's contribution to an organism's reproductive success) and *evolution* (i.e. how that behavior could have arisen in the species over time), which he termed ultimate explanations (Tinbergen, 1964). This systematic approach has been shown, time and again, to generate insights and testable predictions which a purely descriptive or theoretical approach may have been unlikely to arrive at alone. We suggest that researchers attempting to understand charisma and charismatic leadership today, armed with several decades worth of theoretical and inductive work to draw on, are now in a similar position to start answering these questions scientifically.

So far we have briefly alluded to some of the theories which have attempted to explain the emergence of charismatic leadership. The sociological theory outlined by Weber, for example, posited environmental factors such as revolution and crisis as the most likely causal determinants of charisma – a perspective often referred to as the *state* view. *Trait* theories, on the other hand, have suggested that the real explanatory weight is more likely to be located in some set of unique or exceptional personal qualities which distinguish charismatic from non-charismatic individuals – and are ultimately responsible for their success or failure as leaders. Although these two approaches may at first appear incommensurable (Kuhn, 1962) they are not mutually exclusive – instead they represent differing opinions about the proximate causes of charisma. The model of leadership and followership outlined in “leader index” is an attempt to combine these two approaches into an explanation of both *how* and *why* our psychology has evolved to give rise to the phenomenon of charismatic leadership.

The leader index

As outlined in Fig. 1, we propose that charisma is best understood as the result of an interplay between evolved followership mechanisms, contextual factors, physical and social cues from potential leaders, and active signaling on the part of the potential leader – the sum of which constitutes their charisma. Leadership and followership, at the proximate level, consist of a set of psychological mechanisms which enable one individual – the follower – to make automatic, rapid and accurate assessments about the likelihood that a leader candidate will be successful in coordinating the activity of others, based on any available sources of information (Spisak, Homan, Grabo, & van Vugt, 2012; cf. “model-ranking” in Henrich, Chudek, & Boyd, 2015). There is substantial evidence that such mechanisms are already present in young children, whose inferences of leadership ability based on facial cues alone have been shown to correlate with electoral outcomes in the real world (Antonakis & Dalgas, 2009; Cogsdill, Todorov, Spelke, & Banaji, 2014). However, because “leadership potential” is a quality which cannot be directly observed, we propose our followership psychology has instead evolved to attend to those cues which are available as inputs, namely: (a) *external factors* embedded in the environment (e.g. war, peace, stability, change, movement) which determine the kind of coordination challenge the group is facing, (b) *physical cues* of leadership potential (e.g. height, attractiveness, formidability and facial appearance), and (c) *social cues* (e.g. reputation, network size, and signaling abilities). Together these variables should reliably predict who emerges as leader in particular situations.

In evolutionary psychology, this type of computational mechanism – which we have labeled the *leader index* – is typically conceptualized in the form of an “internal regulatory variable” (Tooby & Cosmides, 2008). Evidence has been found for the existence of other such indices in the human mind; for instance, when estimating one's genetic relatedness to another group member (the

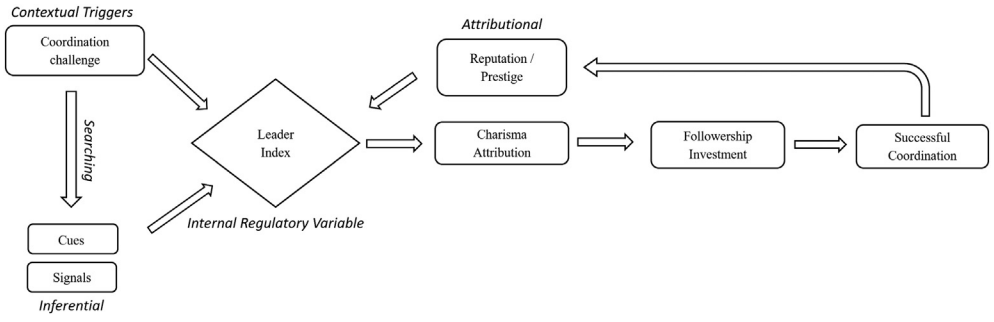

Fig. 1. The Leader Index: A Model of Contextual, Inferential, and Attributional Factors Influencing Charismatic Leadership).

kinship index; Lieberman, Cosmides & Tooby, 2007), or the ability of individuals to inflict costs on others (the formidability index; Sell, Tooby, & Cosmides, 2009). Like the "kinship" and "formidability index" the leadership index can be conceived as an evolved computational mechanism which allows individuals to assess and compare individuals on the basis of whether they are able or willing to provide coordination benefits. This computation is thus an essentially quantitative measure which can be continuously updated in the mind as new information arrives. By attending to features of the environment in which leader selection takes place, physical and social cues and signals being sent by other members of their group, as well as information about the past performance of a particular leader, followers are able to recognize the need for leadership when it arises and decide who best to follow in a given circumstance.

To begin with a concrete example of how contextual features can interact with cues of leadership to activate a specific followership psychology, consider a situation in which one group is confronted with the need to defend themselves against another. Such intergroup conflict has played a significant role in the story of human evolution; evidence suggests that coalitionary violence was common in our species (Bowles, 2009). War is a high-risk, high-reward strategy, in which the victors benefit from access to the territory and potential mating partners of other groups and thus has important reproductive consequences (Wrangham & Peterson, 1996). Thus, it should come as no surprise that the perception of such conflict has been shown to influence leader preferences across multiple studies – with followers preferring individuals who possess cues or send signals indicating their ability or willingness to protect the ingroup and fight the out-group (Little, Burriss, Jones, & Roberts, 2007; Spisak, Homan, Grabo, & van Vugt, 2012). Specifically, followers prefer leader candidates whose facial or bodily features demonstrate a higher degree of masculinity – e.g. a pronounced jaw, prominent supraorbital ridge, and a wider nose. These physical features result from increased levels of testosterone, which itself has been shown to increase the likelihood of engaging in aggressive, dominating behaviors (Apicella et al., 2008; Carré et al., 2009; Stenstrom, Saad, Nepomuceno, & Mendenhall, 2011). Men with relatively higher levels of testosterone, for example, are more willing to behave more aggressively as group leaders in simulated war games (Johnson et al., 2006).

In the above example it is possible to establish a fairly straightforward link between an observable physical characteristic (i.e. facial masculinity) and an otherwise imperceptible underlying quality (i.e. testosterone). To use the terms employed by evolutionary psychologists, facial masculinity can be considered a *correlate* of testosterone levels. However, because this correlation is perceptible to others, and reliably influences their preferences (i.e. choosing a leader because of their ability or wiliness to engage in aggressive actions) it also satisfies the criteria to be labeled a *cue*. The importance of this distinction will become clearer when we discuss the distinction between cues and signals in Section. However, let us begin by elaborating on this model and identifying more of the contextual factors we suggest are the most important inputs into this computation – adjusting the leader index of the various candidates, and allowing potential followers to draw inferences about the likelihood of their engaging in specific behaviors in the future by attending to observable cues.

Contextual factors

An evolutionary psychology perspective makes clear that leader preferences should vary with the adaptive coordination challenges that groups are facing. The leader index scores of individuals – and their charisma ratings – should vary with the extent to which they can help groups overcome a specific challenge. This means that some cues that are relevant in warfare such as facial masculinity may not be relevant when choosing a peacetime leader (Spisak et al., 2012). Although our ancestral environment was one in which human groups were under constant threat of violence, the level of intragroup cooperation made possible during times of peace has ultimately allowed human groups to thrive (Wright, 2001). Like many other social species, human groups are characterized by high levels of voluntary food sharing, communal parenting, and infant care from older siblings, mating partners, and grandmothers, all of which typically coincide with strong pair-bonding and family groups (De Waal, 1996). Our theory thus predicts that the perception of contextual factors which make the potential benefits of cooperation more salient constitute another major input into the leadership index. It is worth noting that many of the most iconic examples of charismatic leaders in recent history, such as John F Kennedy ("Ask not what your country can do for you…"), Martin Luther King ("I have a dream…") or Barack Obama ("Yes We Can…") were extraordinarily effective at signaling the both the urgency and the need for intragroup cooperation.

As a different example, consider a time of transition. Sometimes groups need to change in order to survive – for example, a decrease in available local resources may force them to explore unknown territory, and scout for new sources of food or shelter. Age, and particularly young age, may be a cue to the ability of potential leaders to successfully coordinate group transition as younger leaders are likely to be more open-minded and take greater risks. In the context of change, therefore, our leader index may be more strongly influenced by cues of youth – and charisma is likely to be attributed to leaders who exhibit cues of increased strength, stamina, and physical ability – all qualities which would have historically increased the likelihood that younger leaders could direct such changes successfully (Spisak, Grabo, Arvey, & van Vugt, 2014b). In modern society, evidence suggests that entrepreneur leaders are younger, whereas the boardrooms of Fortune 500 companies are more likely to be made up of older individuals (http://beta.fortune.com/fortune500/).

Additional cues

Formidability

Individuals who are taller and physically stronger than their peers, for example, may have a higher leader index because they are expected to have greater success in physical combat, in punishing defectors, and attracting the attention of followers – these are all important leader characteristics in ancestral environments (see Blaker et al., 2013; Von Rueden & van Vugt, 2016 for extensive reviews). Interestingly, there is evidence taller leaders are deemed more charismatic by followers (Hamstra, 2014).

Facial appearance

Much of the research in this area suggests that followers pay particular attention to information signaled through facial features (Little, Jones, & DeBruine, 2011) and expressions (e.g. Masters, Sullivan, Lanzetta, McHugo, & Englis, 1986; Trichas & Schyns, 2012). Perceptions of facial attractiveness and health also can serve as signals of one's leadership potential in physically demanding environments (Spisak et al., 2014a), and more specific features have been shown to rapidly influence perceptions of personality attributes such as warmth, competence and trustworthiness (Todorov, Mandisodza, Goren, & Hall, 2005). Research on the evolutionary psychology of leadership continues to uncover new ways in which our evolved psychology makes use of the wealth of information conveyed by our faces (for a review, see Grabo & van Vugt, 2016).

Attractiveness

Some evidence has been found suggesting that a leader's charisma is correlated with physical attractiveness (Friedman, Riggio, & Casella, 1988). This relationship could be the result of several factors – first and foremost that a more attractive face is more likely to attract the attention of group members, a hypothesis supported by evidence that physical attractiveness is also positively related to social skills (Feingold, 1992). Furthermore, this “halo effect” seems to begin very early in life, as even infants spend more time fixated on attractive versus unattractive faces (Langlois et al., 1987; Young & Bruce, 1998). From an evolutionary perspective, why would we attribute charisma to attractive looking faces? It may be that facial symmetry (which is highly correlated with attractiveness) functions as a cue for “good genes”. Indeed, evidence suggests that in environments where disease concerns are more prevalent, leaders tend to be more physically attractive on average (White, Kenrick, & Neuberg, 2013). However, global attributes such as attractiveness do not appear to be highly predictive of charisma when performance is directly observable, for example height has been shown to be less important in the domain of sports (Elgar, 2016). Instead, attractiveness in a leader candidate appears to be most important when there is greater distance between leaders and followers, or in “fuzzy domains” when other personal information about the leaders is lacking (see Antonakis & Jacquart, 2013). In our modern media-saturated world most voters are inundated with images of leader candidates, but have relatively little access to information that would have been available in the small-scale societies in which humans evolved (such as information about coalition size or information gained from face-to-face interactions). Absent these cues, physical attractiveness may now exert a disproportionate influence on leadership emergence that may not reflect its relative importance in our ancestral environment, where it served primarily as a cue of genetic quality and health.

If this is the case, then our theory would predict that attractiveness should matter more in predicting leadership in “fuzzy” domains (such as politics), and especially when followers have incomplete knowledge about the leaders. Indeed, Lawson, Lenz, Baker, and Myers (2010) discovered among US-voters that facial appearance of political candidates was more influential among voters who had little political knowledge but who watched a lot of television. In summary, an evolutionary approach suggests that the connection between attractiveness and charismatic leadership may be more than a simple “halo effect” (Verhulst, Lodge, & Lavine, 2010), and we hope to see future research which establishes the strength of this relationship.

Coalition size

Finally, evidence from small-scale societies indicates that a great deal of the influence and charisma that leaders have also depends on social factors such as their *coalition size* (i.e. the size of one's family or network of exchange partners; von Rueden, Gurven, Kaplan, & Stieglitz, 2014), and *heredity* (a leader's children often inherit the status and social contacts of their parents, and leaders with greater social networks are indeed granted more prestige (Glowacki & von Rueden, 2015).

Signals

Above, we have argued that facial masculinity (and physical formidability) function as cues that a potential leader possesses underlying qualities which make it more likely they will successfully coordinate action in particular contexts (e.g., protecting the group when it is under attack). Paying attention to such cues increases the survival chances of followers, which is why such followership mechanisms evolve (van Vugt & Ronay, 2014). Yet there are many physical cues which are ultimately irrelevant to the survival of followers (e.g., a leader having brown or blue eyes). It is only when the former criterion is met – that is, when a cue has been selected by evolution because it increases the survival and reproductive chances of both senders (aspiring leaders) and receivers (followers) – that a cue can properly be described as a *signal* (Henrich, 2009; Scott-Phillips, 2008). In the animal world, a classic example is the peacock's tail, which is so large that it makes a male peacock more vulnerable to predators and parasites. The tail is a therefore a *correlate* of genetic quality, and a *signal* because this information has fitness benefits for both males who display them and females who use them to discriminate between potential mating partners.[2] Most importantly, signals sent by charismatic leaders tend to be "honest on average" [HYPHEN] that is, it contains enough information on average that the receiver on average is better off assessing the signal than ignoring it.

Signals are ubiquitous in animal communication, and there is substantial debate about how such signals can be selected for in terms of costs and benefits. However, along with Searcy & Nowicki, 2005, we would argue that leader signals are mostly likely best

[2] Evolutionary biologists once thought that for such signals to evolve they must be costly for the bearer (costly signaling theory; Zahavi, 1977), otherwise they could be easily faked. The peacock's tail, for example, is costly – only males of the highest genetic quality can afford to grow and carry it around. However, more recent evidence suggests that it is not only the cost but the honesty of a signal that matters – so long as it is in the interests of both the senders to convey a particular trait and the receivers to pay attention, signaling is possible (Maynard Smith & Harper, 2003).

analyzed in terms of *production costs*, *developmental costs*, and *maintenance costs*. Production costs require energy at the time the signal is exhibited; for example, leaders are often required to give long speeches while speaking at a high volume. They often also engage in behavioral mimicry such as smiles and head nods, and generally indicate interest and excitement through an increased activity level. Developmental costs make use of costs or resources which have are paid for in advance; for example, leaders make use of the substantial amount of energy required to maintain the human brain to influence others (Nowicki et al, 1998). Maintenance costs are ongoing costs; examples of which in terms of leaders might include increased vulnerability from competitors or outgroup members, increased chances of "receiver retaliation (Vehrencamp, 2000)," when signals are misunderstood, and the need for consistency - that is, charismatic leaders must maintain their reputation, and continue to demonstrate expertise through smooth and fluid speech or movement (Pentland, 2010). As we will demonstrate in the following section, many of these cues or signals align closely with the qualities charismatic individuals possess.

An evolutionary signaling perspective on charismatic leadership

Having outlined the main elements, we are now in a position to propose a definition of charismatic leadership which addresses both the proximate mechanisms and the ultimate functions. A *charismatic leader* is defined as an individual who signals their ability and willingness to swiftly mobilize group action in the face of an urgent coordination challenge, and *charismatic leadership* is the process by which such leaders emerge and are able to influence follower behavior in order to more efficiently coordinate in response. In section Signals of charisma we will outline some of the specific signals which charismatic leaders are able to make use of to exert their influence on followers. How such signals help to solve adaptive challenges will be elaborated upon in section The stag hunt: Toward an ultimate explanation of charismatic leadership.

Signals of charisma

Attracting attention

First and foremost, leaders signal information simply by expending greater amounts of energy to attract the attention of others – for example, one of the most effective ways to direct group movement might be simply pointing excitedly toward a source of food or a potential aggressor (*surgency*; Pentland & Heibeck, 2010). Anecdotal evidence suggests that possessing particularly unique physical features, such as Abraham Lincoln's elongated face or Rasputin's piercing eyes, may also affect charisma as a result of their attention-grabbing ability. This hypothesis is further supported by evidence suggesting that greater degrees of fluctuating asymmetry are associated with increased scores on measures of transformational leadership (i.e., charisma) as well as effectiveness (Senior et al., 2012). With the development of language, however, human signaling has become orders of magnitude more complex and nuanced when compared to those found in other species. Numerous studies have shown that the ability to control one's expressions, voice pitch, pace, and so on are positively related to leadership emergence (Klofstad, Anderson, & Peters, 2012).

Arousing emotions

Rhetorical skills are most likely interpreted by followers as signals of a leader's intelligence, as the ability to craft powerful speeches and invent creative metaphors are outwardly visible signals of a leaders' mental abilities (Silvia & Beaty, 2012). Orators who are able to arouse the emotions of followers may therefore be simultaneously signaling their ability to lead (Antonakis et al., 2016). Indeed, research has demonstrated that there are a number of specific verbal tactics such as the use of lists and metaphors which can directly influence the perceptions of charisma (Antonakis, Fenley, & Liechti, 2011; Frese, Beimel, & Schoenborn, 2003).

Although an individual who possesses extraordinary rhetorical abilities may be more likely to influence the behavior of others, truly charismatic leaders are able to make use of these skills to convey the urgency of the challenge facing the group and inspire them to collective action (Awamleh & Gardner, 1999; Conger, 1991). Consider the example of the “prophet of doom,” a type of religious leader who in every generation can be found warning others that the end is near. By setting the stakes so high, such leaders are more likely to not only attract the attention of others; but are frequently able to persuade their followers into acts that would be unthinkable to most of the individuals themselves.

Articulating a vision – Invoking shared values, norms and collective identity

These tactics are typically directed toward the articulation of a “vision,” beginning with a description of the situation as it currently stands, and then identifying the ways in which it could be improved through collective action. Perhaps the most famous example of this is the “I have a dream” speech, in which Martin Luther King, Jr. laid out a powerful vision of “collective possible future selves” which ultimately become a reality within a generation (Stam, Lord, van Knippenberg, & Wisse, 2014). Such signals are amplified when charismatic leaders are able to reinforce norms that are relevant to the situation, and draw attention to shared values and symbols in a collective setting which further facilitates coordination (Bulbulia & Frean, 2010). When a leader gives a speech in the presence of a crowd, they signal both their understanding of the problem at hand and their willingness to act as “first mover” in resolving the social dilemma (Levati, Sutter, & Van der Heijden, 2007).

From the Greek Agora to modern social media, leaders have made use of whatever technologies are at hand to ensure that their message is delivered to as many listeners as possible. The communal nature of such communication makes it easier to persuade each listener that others around them hold similar values, and are more likely to behave as they would when such norms are salient in their own minds. This shared knowledge makes it easier for followers to coordinate, as it increases trust and the perceived likelihood that others will respond similarly (Henrich et al., 2015; Balliet, 2010; Dirks & Ferrin, 2002).

Charismatic leaders, therefore, function as focal points in coordination games through which individuals and groups can identify and align themselves with communal goals, and strengthen their sense of a shared identity (Dal Bó & Dal Bó, 2014). When a leader is able to engage the emotions and motivations of a group in this way, the strength of the signal appears to be amplified, and this positive or negative affect can quickly become contagious by spreading through the group (Shamir et al., 1993).

To sum up, we argue that charismatic leadership is best viewed as an active signaling process (Pentland, 2010) whereby an individual – often initially as a result of possessing a set of identifiable physical or social cues which indicate leadership potential – is able, through both verbal and nonverbal signals, to attract the attention of followers, engage and synchronize their emotions, offer a vision, reinforce cultural values and norms, and to provide a shared sense of identity behind which a group of followers can rally.

The stag hunt: Toward an ultimate explanation of charismatic leadership

Thus far we have outlined the ways in which contextual factors, physical and social cues play a role in increasing one's leadership index, argued that charisma is a generalized signal that followers use to assess someone's ability to coordinate swift and urgent group action, and identified some strategies that individuals use to effectively send such charismatic signals. Let's now turn to discuss the evolutionary origins of charismatic leadership. We will argue that charisma signals have been selected for because they increase the likelihood of successful coordination among groups of followers facing an urgent challenge.

Charismatic influence can be either a direct or indirect process. A leader who is able to engender a sense of identification among followers and then acts as a "first mover" – leading by example – is exerting a direct influence on the outcome of followers. Indirectly, however, a charismatic leader often serves as a focal point, whose public speeches and symbolic actions serve to change or align followers' values and beliefs about what other followers are likely to do. In both cases, we argue that what makes charismatic leadership such a powerful influence is that it consists of signals that enable groups to better coordinate in response to a range of urgent adaptive challenges (like war, peace, or group movement), and increase confidence that such cooperation will result mutually beneficial outcomes.[3]

Signaling theory (Maynard Smith & Harper, 2003) suggests that followers have evolved to pay attention to charismatic leaders, especially in situations requiring urgent coordination, because it results in mutually beneficial outcomes. It was the philosopher Rousseau who first described a coordination problem, now commonly referred to as the Stag-Hunt game, which provides a possible model for the evolution of charismatic leadership. In his "Discourse on Inequality," Rousseau describes a situation in which two (or more) players have decided to hunt a stag, which requires them to cooperate. Unlike the Prisoner's Dilemma, in which the rational choice is to defect, in the Stag Hunt the rational choice is for players to coordinate with each other (whether it is hunting the hare or the stag). Game theorist Skyrms (2001) describes the options of the game (here between two players, but the n-version is essentially the same):

"A player who chooses to hunt stag takes a risk that the other will choose not to cooperate in the Stag Hunt. A player who chooses to hunt hare runs no such risk, since his payoff does not depend on the choice of action of the other player, but he foregoes the potential payoff of a successful stag hunt. Here rational players are pulled in one direction by considerations of mutual benefit and in the other by considerations of personal risk."

It is precisely this role – helping individual agents move from the Hare equilibrium to the Stag equilibrium – which we propose has ultimately led to the selection of charismatic leadership in human societies.

To elaborate, the two major challenges that limit the likelihood of successful coordination are: (1) players have incomplete information about the actions of the other, so that even a well-intentioned player may choose incorrectly, and (2) given this lack of information, and because both outcomes are not equally desirable, the temptation will arise to defect to the inferior outcome (Hare) unless one has reason to believe the other will not do the same. The most important factor which determines the likelihood of successful coordination is therefore the *belief* each player holds about what other players in the game will choose (Bulbulia & Sosis, 2011). What our model suggests is that charismatic leadership may have evolved precisely because it is a such an effective means of influencing beliefs among large numbers of followers, especially to the extent that it reinforces shared values.

In this urgent hunting problem, we find a clear illustration of how a charismatic leader can increase the likelihood that their followers will successfully coordinate to achieve a collectively beneficial outcome – the signals sent by charismatic leaders are uniquely effective at ensuring that their message is spread throughout the group. Indeed, previous research has demonstrated that even minimal exposure to charisma (i.e. watching short video clips of a charismatic speaker) can promote cooperation between strangers in trust and dictator games as well as increase coordination between players in Stag Hunt game (Grabo & van Vugt, 2016). Ultimately, the explanation for the evolution of charisma may stem from its ability to make such signals so ubiquitous throughout a population. As a member of a group headed by a charismatic leader, the decision to cooperate becomes a more rational strategy because it is reasonable to assume that, no matter whom one's partner is, they too are likely to have heard the same speeches, felt similar emotions, shared a similar vision, and been reminded of the same values and norms of behavior. Such a partner is therefore much more likely to cooperate than one who has not– moving a group to a cooperative equilibrium from which everyone in the group (including the leader and followers) benefit.

[3] To the extent that the charismatic influence attempt succeeds, we propose such leaders will be granted status and prestige by followers (the-service-for-prestige theory; Price & van Vugt, 2014), which in turn feeds back into their leader index.

Discussion

Our evolutionary signaling perspective offers a new way of looking at the origins, evolved functions, and psychological mechanisms underlying charismatic leadership. Ultimately, the function of charismatic leadership is to enable followers to swiftly coordinate their actions by rallying behind the leader, thus allowing them to overcome a pressing challenge which would be otherwise insoluble. Of course, many issues remain - perhaps most crucial is the need for further validation that the adaptive problems we point to as causal determinants of charisma indeed constituted fitness-relevant and recurrent adaptive challenges for our ancestors In the following paragraphs, however, we wish to propose a number of key questions and issues which we believe represent the most fruitful avenues for further research.

Multimodal signaling

Are charismatic leaders more persuasive when they are able to send signals though multiple channels? In nature, biological signals are constantly undergoing a process of dynamic selection: changes in the environment may prevent certain kinds of signaling from being received. In response to this problem, many organisms have evolved strategies for transmitting information via multiple sensory modalities to compensate for fluctuations in the environment which could disrupt critical signaling processes such as finding and attracting mates. Insects and arachnids, for example, are able to transmit information redundantly via both chemical, visual and auditory signals (Rypstra, Schlosser, Sutton & Persons, 2009).

Similarly, in humans particularly charismatic individuals maybe those who use a wide range of signals, visual, auditory, verbal and nonverbal, to contest leadership, only some of which will be relevant given the current environmental conditions. Rather than searching for the “right way” to project charisma, it may be useful to investigate how leaders vary in their ability and willingness to send multiple signals to followers through various sensory channels. In many societies, we observe environments which are deliberately rich in information from all sensory modalities – for example, the music, ornate stained-glass windows and incense which accompany a Catholic mass, the pomp and circumstance of a royal coronation or a presidential inauguration. Our theory would predict that charismatic individuals should be particularly skilled at making use of these particular niches (Atran & Henrich, 2010), and their variety of different signals to attract the attention of followers and amplify the effect of their own verbal and nonverbal cues, just as previous research has found that the more tactics managers used the more their charisma ratings improved (Antonakis et al., 2011).

Supernormal stimuli

Do charismatic leaders “hijack” our evolved follower instincts? A supernormal stimulus is an exaggerated version of a stimulus to which there is an existing response tendency, or any stimulus that elicits a response more strongly than the stimulus for which it evolved. Our fondness for sugary foods is an often-cited example of how a behavior which was adaptive in the past – i.e. “when you find sugar, eat as much as possible” – is no longer a successful strategy in an environment full of processed foods, and in which nearly everything we eat contains added sugars in order to take advantage of this behavioral mismatch (Power & Schulkin, 2013). In modern societies, charismatic signals can become amplified through the media or propaganda, such that one individual is able to attract the attention of millions (think of Hitler's Nuremberg rallies, or a World Cup goal seen around the world at the same time). This concept may help to explain why we are so strongly affected by charismatic leaders today – in the presence of such large audiences, a leader's charisma should be expected to increase dramatically.

What both multimodal signaling and supernatural stimuli suggest is that charismatic leaders are uniquely effective at “overloading” the receivers with information - hijacking our evolved heuristics in the same way as a brightly colored bowl full of sugary breakfast cereal. One particularly interesting consequence of this is that, while in such a state, followers are less able to discriminate between veridical and non-veridical signals. This conjecture has been strengthened by the results of research demonstrating that the mere belief that one is interacting with a particularly charismatic individual can cause followers to downregulate brain areas responsible for error monitoring (Schjoedt et al., 2013).

Temporality and novelty

Why does charisma tend to diminish over time and why is it often attributed to outsiders? Our model suggests that followers should be particularly sensitive to charismatic signals when facing novel coordination challenges or coordination challenges that the existing hierarchy of the group have not been able to deal with (e.g., the popularity of Jesus as a protest against the corrupt Temple priests). Thus, one potential explanation for why the effects of charisma are so often short-lived is that once these urgent coordination challenges are resolved, followers are no longer attuned to the kinds of signals which enabled the charismatic leadership to emerge.

Next, problems which are novel – such as the threat of global climate change or terrorism – may also make followers particularly susceptible to charismatic outsiders who have not been part of the established hierarchy of the group (and thus carry no responsibility for causing the problems). Indeed, the rise of charismatic, populist leaders in the world (e.g. the rise of Trump, Duterte and Erdogan) may be a function of our desire for charismatic individuals who may be able to quickly mobilize the masses to deal with particularly urgent threats like immigration, terrorism or climate change. There is much more to be learned about the time-scale on which charisma operates, and how charismatic leaders are viewed as such challenges come and go.

Charisma after death

Why might a dead leader be charismatic? One fascinating area of research which has yet to receive the attention it deserves concerns the tendency for leaders to be attributed greater charisma after their death. Steffens, Peters, Haslam, and van Dick (2016) have suggested that this may be because in retrospect they are seen "from the perspective of what they meant to others and … as overlapping with the fate of the collective that they represented." This idea highlights the importance of the symbolic nature of charisma, in which one figure comes to represent an entire ideology, culture, or religion. An image of Che Guevara, for example, is often used to signal one's willingness to participate in active political protests or support for revolutionary movements. The logic underlying the Stag-Hunt game helps to understand this charisma-after-death phenomenon. Charismatic leaders may directly influence follower's outcomes or they may influence the expectations that followers have about each other's willingness to cooperate. A dead leader may be influential as a focal point for coordination between followers. As long as their charismatic appeal increases the trust that followers have in each other to join collective action, it does not matter whether they are dead or alive.

Honest versus costly signaling

Animal signaling theory (Maynard Smith & Harper, 2003) assumes that organisms have evolved to pay attention to signals that are honest, that is, these signals must benefit both the sender and the receiver (as in the case of the peacock's tail). Using the logic of the Stag-Hunt game we have shown that (a) there are benefits for both parties to coordinate and (b) charismatic signals can move a group toward a better joint outcome (hunting the stag). A remaining issue is whether these signals necessarily need to be costly. In his influential (1973) article, the economist Michael Spence laid out a framework specifying the importance of costly signals in the job market. For example, a classic case of costly signaling would be the choice to invest in a college education. Despite the fact that this is a costly decision both monetarily and in terms of time investment, because of its intrinsic value it will ultimately pay for potential employees so long as employers identify it as a signal correlated with desirable qualities which could not otherwise be directly observed (e.g., intelligence, ambition, diligence).

Such costly signals can increase someone's charisma, so long as followers perceive them as a credible means by which to distinguish between good and bad leaders. A potential leader can demonstrate their credibility either through (a) behaviors that would be too costly or time-consuming to be worth faking, or (b) by communicating values, which risks alienating potential supporters who do not share those values. Leaders who sacrifice for the cause should be more likely to be granted charisma than those who do not, especially when such leaders are able to signal that their sacrifice is both costly and group-serving. For example, Nelson Mandela's decision to use his trial as a political platform resulted in nearly 30 years of jail time, but also made him into a worldwide figurehead and drew the attention of millions to the problem of apartheid. Expanding on this then, it should come as no surprise that a leader who is willing to die for a cause should be deemed especially charismatic.

The dark side of charisma

A final point concerns our explanation for the presence of toxic charismatic leaders in the world today. The mere fact that charisma continues to exert such a powerful influence on followers suggest that such signals in our evolutionary history have tended to be *honest* more often than not, because a preponderance of *dishonest* signals or cues – leaders who deceptively signal their abilities to help the group but in fact harm them – would ultimately cause receivers to stop paying attention to them (like the boy who cries wolf). Nevertheless, in present times charismatic signals are often deliberately hijacked by individual leaders who fail to bring benefits to followers, but instead benefit themselves. This is likely due to a mismatch between small scale ancestral environments where we knew our leaders inside out and the modern complex environments where as followers we paid attention to a range of different cues and signals to determine which leaders to follow (von Rueden & van Vugt, 2016). In the absence of such richness of cues, we may grant leadership to individuals who come across at first glance as charming or inspiring, but who have no ability or willingness to provide coordination benefits. It is interesting to note that the distinction between honest and dishonest signals aligns quite closely with that made between *socialized* and *individualized* forms of charisma made in the organizational literature (House & Howell, 1992; Howell, 1988). Honest signaling and socialized charisma, for example, both function to improve the fitness or well-being of senders and receivers, whereas dishonest signaling and individualized charisma are ultimately harmful to the well-being of particularly the receivers. The emergence of toxic charismatic leaders may be a manifestation of people attracting the attention of followers in information-poor environments.

In conclusion, at its most fundamental level we argue that although the specific context and content out of which charismatic signals can be fashioned may be so varied that no two signals are ever the same, ultimately the *function* of charismatic leadership is to convince followers that the risks of cooperation are not as great as they seem, and that both the leader and followers truly believe that the challenge confronting them can be resolved (Walter & Bruch, 2009). However, there remain many aspects of this explanation which have yet to be explored. Hopefully, as we continue to advance our understanding of charisma, we can also learn how to harness it to increase cooperation, and also better guard against its deliberate misuse.

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Appendix A. Glossary of key terms

Ancestral environment/EEA: The environment in which an adaptation evolved, including selection pressures that were necessary for its development and proper functioning. Most evolutionary psychologists argue that many unique human psychological mechanisms evolved during the Pleistocene - a period beginning around 2.5 million years ago and ending 12,000 years ago with the agricultural revolution.

Collective action problem: Also known as a social dilemma. Refers to a range of situations in which individuals stand to benefit through cooperation, but are confronted by disincentives such as free-riders, asymmetrical payoffs, or the inability to direct the actions of larger groups.

Charismatic leadership: A form of leadership which can be conceptualized as a signaling process whereby an individual conveys their ability to solve an urgent coordination challenge. The signals (both verbal and nonverbal) allow the charismatic leader to attract attention, reinforce social norms and a sense of collective identity, and strengthen the beliefs of followers that their cooperation will be reciprocated.

Correlate: An observable feature or behavior of an organism which reliably correlates with an underlying attribute (which could not otherwise be observed).

Cue: A correlate which is reliably perceived by others, and which influences their behavior.

Signal: A cue which is reliably perceived by others, and which influences their behavior and has been favored by natural selection because it provides fitness benefits to both senders and receivers.

Heuristic: Relatively fast and efficient decision-making rules which enable people to make decisions, come to judgments, and solve problems, even which such situations are complex or there is insufficient information to find the optimal outcome.

Internal regulatory variable: Any of a number of evolved variables which indirectly regulate cognition and behavior by indexing values necessary for “higher-level” behavior-controlling and computation-controlling procedures.

Proximate explanation: An explanation for an observed trait, behavior, or adaptation which describes its *causation* (the specific stimuli which produce it) or *ontogeny* (how it develops over time).

Ultimate explanation: An explanation for an observed trait, behavior, or adaptation which describes its *survival or reproductive value* (how it increased reproductive success) or *evolution* (how it arose in the species over time).

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