Predictors of leadership: The usual suspects and the suspect traits

John Antonakis
Faculty of Business and Economics
University of Lausanne.
Internef 618
CH-1015 Lausanne-Dorigny
Switzerland

john.antonakis@unil.ch
Tel ++41 (0)21 692-3438
Fax ++41 (0)21 692-3305

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Abstract

In this chapter, I review literature on traits (i.e., individual differences) and their links to leader outcomes. I present an integrated model, the ascription-actuality trait theory, to explain two routes to leader outcomes that stem from traits: the route that objectively matters and the route that appears to matter but objectively may not. I discuss the history of trait research and provide criteria by which we should judge the validity of trait models. Finally, I review trait models that are the most predictive of leadership outcomes and identify those that are non-starters.

A major preoccupation of teams, organizations, and countries is to select leaders who will be effective. This issue is timeless and very important, given that leadership appears to matter much for organisational effectiveness, particularly at the highest echelons where leader discretionary power is high (Bertrand & Schoar, 2003; Finkelstein & Hambrick, 1990; Hambrick & Finkelstein, 1987; Hambrick & Mason, 1984; Jones & Olken, 2005; Lowe, Kroeck, & Sivasubramaniam, 1996).

Plato was one of the first to write about the importance of leadership, its determinants and its outcomes. In the *Republic* (Plato & Jowett, 1901), Plato acknowledged that individuals could not be successful in different types of vocations and that innate characteristics—which predict effective leadership—were not equally distributed in the population. That is, he suggested "we are not all alike; there are diversities of natures among us which are adapted to different occupations" (p. 50). Plato proposed job-fit leadership theory arguing that the state must select "natures which are fitted for the task" (p. 56). Plato went on to suggest that: "There will be discovered to be some natures who ought to . . . be leaders in the State; and others who are not born to be [leaders], and are meant to be followers rather than leaders" (p. 175). He acknowledged that "The selection [of leaders] will be no easy matter" (p. 56).

For Plato, individuals were not as rational as we would hope them to be, which oftentimes left to chance (or other specious factors) the selection of leaders. His allegory about the sailor who became captain because he was stronger and taller than the other sailors provides an example regarding the extent to which Plato thought the most able might not rise to power if the selection was left to individuals who did not have the appropriate expertise and rational faculties to undertake the selection. Indeed, the captain may have *seemed* to be better (because of his physical qualities), however, as mentioned by Plato, the captain "is a little deaf, and has a similar infirmity in sight, and his knowledge of navigation is not much better" (Plato & Jowett, 1901, p. 190). Plato wanted to ensure that those who were appointed to power were the best qualified, both in terms of their abilities and training. He gave several traits he thought were essential for effective leadership.

The quest for traits that predict effective leadership continues today. Interestingly, I will come full circle and show that many of Plato's insights were remarkably concordant with current research. He identified aspects of intelligence and personality that were important for leadership including

"courage, magnificence [i.e., having perseverance and fortitude], apprehension [i.e., referring to learning, perception, or intelligence], memory" (p. 193) "skill in asking and answering" (p. 243); those that were the "surest and the bravest, and, if possible . . . the fairest . . having noble and generous tempers" (p. 243), "keenness and ready powers of acquisition" [i.e., wise, clever] (p. 243) and who exhibited dialectical reasoning (which in this context referred to being logical in argument, showing critical inquiry and intelligence) (Plato & Jowett, 1901); (see *The Oxford English Dictionary Online*, 2000 for word definitions).

In this chapter, I will discuss whether leadership (political or organizational) can be predicted by individual differences. Complicating my task, however, is the reality that research on individual differences in leadership has gone through peaks and troughs, as well as many fashions! The literature has also been bombarded by "newly-discovered" traits—many of which are far from being newly discovered or are simply irrelevant or not very important for leadership and work outcomes. The proliferation of trait models has, unfortunately, muddied the literature; furthermore, legitimate constructs are being taken less seriously because of sensational yet unsubstantiated claims by some popular writers (e.g., Goleman, Boyatzis, & McKee, 2002) who have not scientifically tested their speculations or had their claims scrutinized in top peer-reviewed scientific journals.

In this chapter, I present individual-difference models that have stood the test of time and show that there are traits that predict leader success; the fact that these traits have been researched over a long period of time does not make them antiquated. In a way, these trait models are like aspirin: discovered many decades ago but still effective today. I define traits and discuss their antecedents. Next, I present what I refer to as an ascription-actuality trait theory of leadership to explain why some traits actually matter (objectively) for leadership effectiveness to the observer whereas other traits appear to matter to the observer but objectively might not. I provide a historical overview of the literature to show how trait research fell in and out of (and then in again) favour of leadership scholars, and how methodologically-sophisticated research approaches have engendered a renaissance in trait research. Then, I briefly discuss the criteria that researchers should use to sift through the field to select models that are valid. Finally, I review trait models that are the most predictive of leadership outcomes and identify those that are non-starters.

What are traits?

As with definitions of leadership, there are many definitions of traits. I will use one that will probably not upset too many differential psychologists. Briefly, traits are psychological or biological characteristics that exhibit four essential properties. That is, *traits are individual characteristics that (a) are measurable (b) vary across individuals, (c) exhibit temporal and situational stability and (d) predict attitudes, decisions, or behaviours and consequently outcomes* (for discussion see Ashton, 2007; Chamorro-Premuzic, 2007; Kenrick & Funder, 1988). Of course, one has to have a theory too, which explains why a trait (e.g., intelligence) predicts effective leadership.

The above definition seems simple; however, hidden behind it are very important implications concerning measurement, methodology, and social cognition. For the time being consider general intelligence as a trait (for further discussion see Gottfredson, 1997; Gottfredson, 2002; Schmidt & Hunter, 1998, 2004)--briefly, general intelligence can be reliably measured with a variety of tests whose results converge; scores of a population of individuals vary on intelligence tests. Intelligence scores measured in different occasions and situations correlate and intelligence scores predict a number of outcomes (e.g., work performance or leadership). Given that intelligence is usually defined as the ability to learn (including information-processing, abstracting, and knowledge), and because the cognitive demands required of leaders in terms of pattern recognition, abstraction, information retention, causal reasoning and the like are great, it is no wonder that intelligence predicts effectiveness. I will revisit intelligence later on.

Of course, there are important nomological issues, in which I will not get entangled for the purpose of this review. All factors are constructs invented by humans that are grouped together in a theory explaining a natural phenomenon. However, the fact that "we name something . . . does not mean we understand it" (Cliff, 1983, p. 120). Cliff referred to this as the "nominalistic fallacy." For the purpose of this review, if traits—which, are mostly genetically determined and thus can be considered as exogenous in a predictive model—predict an outcome, they have some economic utility for society irrespective of whether we call a particular trait that we measure Jane, Onk, or intelligence. Thus, what matters most is how the trait is *operationalized* and what it predicts and not what the trait

is called (though, of course, the conceptualization and description of the trait should follow previous conceptualizations and descriptions of similar things common to our language descriptions).

Note too that although traits do exhibit cross-situational consistency, we must also consider the extent to which one is "given license" to express one's dispositions in certain situations. Psychologists have been taking the "power of the situation" very seriously, particularly after the now well-known Milgram obedience studies were published (Milgram, 1963). Although some are sceptical that the Milgram experiments could not be reproduced today because experimental participants are more savvy (or perhaps more ethical and thus would not administer shocks to someone in a simple learning exercise), the Milgram experiment was recently replicated (Burger, 2009). This result attests to the fact that situations can greatly influence--and at times even constrain--the type of behaviour that is considered appropriate in a particular situation (see also Mischel, 1977). In a very simple and interesting study Price and Bouffard (1974) showed that some situations inhibit the range of behaviours that individuals can demonstrate. For example, churches, job interviews, or lifts (elevators) are rather constraining situations (try belching or sleeping in one of those situations—this explains why I am an atheist who likes job stability and who usually take the stairs!). However, in a park, bar, or football game one can be more free to express one's desires. As an example of how situations specifically constrain behaviours, Barrick and Mount (1993) showed that traits interacted with job autonomy in predicting outcomes: Extraversion predicted managerial performance only in situations where managers had high autonomy (discretion). However, the relation between extraversion and performance was much lower in situations where managers had low autonomy.

In another interesting example, which models a contextual factor and a mediation effect in a process theory, Lim and Ployhart (2004) found that transformational leadership mediated the effects of personality differentially. That is, when the context was "maximum" (i.e., where leaders are being observed and directly assessed) transformational leadership fully mediated the relation of traits to team outcomes and exhibited a stronger relationship to leader outcomes as compared to typical contexts (i.e., day-to-day). Unfortunately, though, studies such as these are exceptions (Antonakis, Avolio, & Sivasubramaniam, 2003; Antonakis et al., 2004); leadership scholars have not considered context seriously enough in their theories (Liden & Antonakis, 2009). As House and Aditya (1997, p. 445)

noted, “It is almost as though leadership scholars . . . have believed that leader-follower relationships exist in a vacuum.” Thus, trait and process models should focus on identifying the contextual constraints that operate on the leadership phenomenon.

Where do traits come from: Nature or nurture?

The biological basis of individual differences is indubitable and has a long history (Ashton, 2007; Chamorro-Premuzic, 2007). Hippocrates, the founder of scientific medicine, suspected that emotions (as well as physical ailments) were affected by the balance among four bodily fluids: Blood (influencing cheerfulness), phlegm (affecting calmness), black bile (impacting depression), and yellow bile (driving anger, courage, and hot temper) (Whiting, 2007). This was a revolutionary theory in a time when most were individuals believed that sickness (and of course their cures) were caused by gods (Whiting, 2007). This particular theory of Hippocrates was, of course, not quite right, though arguably more plausible than even a modern theocentric one. Interestingly, Hippocrates’s theory was very influential well into the nineteenth century (Adler, 2004).

Nowadays, researchers have made many advances in explaining the biological bases of individual differences; basic sciences such as genetics, neuroscience, and endocrinology have proven to be very fruitful. I briefly review some findings showing the promise of this research, particularly in mixing psychometric and behavioural research with basic biological research. Although research based in biology might not have direct implication for the organizational sciences, it has helped to better understand psychometric variables. For example, research in neurosciences has identified that brain structure is influenced by genes (Thompson et al., 2001). More importantly, specific brain regions are reliably correlated with psychometric intelligence (Colom, Jung, & Haier, 2006; Jung & Haier, 2007; Thompson, et al., 2001).

Research in behavioural genetics has also helped psychology advance in many areas. Genes play a crucial role in the long-term survival of organisms. On a broad level, genes affect the basic architecture of an organism (Dawkins, 1986) and its biological processes (Ilies, Arvey, & Bouchard, 2006). Genes, of course are not immutable; they do at times vary randomly and any adaptive evolutionary advantage that has occurred because of random variation will be systematically passed-on to later generations (Dawkins, 1986).

Also, both the environment (including geographic factors) and genes play an important role in affecting individual differences—as Hippocrates had also supposed (Schwartz, 1999). For example, general intelligence, at the country level, is strongly linked to geographic factors (Kanazawa, 2008); however, it also has a strong individual genetic component (Bouchard & McGue, 2003; Thompson, et al., 2001). Indeed, there is much research to suggest that individual differences, like personality and intelligence, have a strong hereditary basis (Bouchard & Loehlin, 2001; Bouchard & McGue, 2003). The heritability of personality is in the 50% range; that of intelligence much higher, particularly in adulthood (Bouchard & McGue, 2003). An excellent review as to the implications of behavioural genetics in organizational behaviour is provided by Ilies et al. (2006).

As regards leadership, three recent studies have provided us with evidence that leadership emergence (Ilies, Gerhardt, & Le, 2004) and role occupancy, both in men and women have a strong genetic basis (Arvey, Rotundo, Johnson, Zhang, & McGue, 2006; Arvey, Zhang, Avolio, & Krueger, 2007; Ilies, et al., 2004). Of course, this research is very fundamental in nature and does not have immediate practical utility (unless a specific leadership "gene" is identified). However, the fact that heritability estimates are large and partly mediated by psychological variables provides us with strong evidence that individual differences matter much for leadership.

Finally, research based on hormones is also slowly breaking into social science research. Hormones, which affect neurological functioning, are important regulators of behaviour (Ellison & Gray, 2009). However, only a few studies have examined the effects of hormones in organizational settings in ways that could be applied to leadership. Testosterone, for example, holds promise in predicting leadership because it is linked to dominance and thus social influence (see Gray & Campbell, 2009; Sellers, Mehl, & Josephs, 2007; Zyphur, Narayanan, Koh, & Koh, 2009). Testosterone has been also been linked to status and risk-taking (which theoretically should predict leadership) and has high heritability; thus, it should be able to provide us with an important biological explanation of leadership (for nice discussions of application in organisational behaviour see: Zyphur, et al., 2009). Also, testosterone has been found to predict entrepreneurship (R E White, Thornhill, & Hampson, 2006; R. E. White, Thornhill, & Hampson, 2007), which is related but not synonymous with leadership (Antonakis & Autio, 2006). Interestingly, although testosterone is an endogenously-

governed hormone, it also reacts to situational influence (Wallen & Hasset, 2009). For example, men with high basal testosterone, and thus are motivated to gain status, have positive endocrinological reactions following victory in a competition (i.e., had lower cortisol levels); however, their levels of cortisol increased following defeat (Mehta, Jones, & Josephs, 2008). Note, cortisol is considered a marker of stress and it has been linked to biological as well as exogenous factors (Kudielka, Hellhammer, & Wust, 2009), and is known to interact with testosterone in predicting aggression (Popma et al., 2007). Interestingly, testosterone seems to affect behaviour in women and men in a similar way, particularly as concerns dominance (Grant & France, 2001; Sellers, et al., 2007); however, more research is needed in the area of sex-differences.

In another fascinating study, researchers exogenously manipulated oxytocin, a key hormone in the regulation of social attachment (Kosfeld, Heinrichs, Zak, Fischbacher, & Fehr, 2005). In this study, individuals played a sequential public-goods game, where cooperation between players increases the players' monetary payoffs. Individuals who were administered oxytocin, demonstrated significantly higher trust by transferring more money to their interaction partner than a control group (who were given a placebo). These results have important practical implications for the functioning of social institutions and leadership.

As is evident, research at the nexus of biology and psychology should yield interesting and high-impact research; it is likely that leadership scholars will start venturing further into this very fertile research landscape. As mentioned by Zyphur et al. (2009) "In order to remain on the cutting edge of social science scholarship, the field of management and organizational studies must now catch up with related disciplines that are pioneering the integration of their study with biology."

Ascription-Actuality Trait Theory

In this section I introduce an integrative trait process theory as an organizing framework for the individual-difference variables I review in this chapter. With this framework, I describe how traits affect leader emergence and outcomes; however, I differentiate between traits that *really* matter for leadership and those that *seem* to matter. The reason for the latter occurrence is because observers have what we can refer to as "folk theories" of leadership. That is, observers might identify traits that vary (e.g., intelligence, facial appearance) and then attempt to link these constructs to real-world

outcomes (e.g., effective leadership). At times, these correlations are valid. At other times, individuals see what can be termed "illusory correlations"(Tversky & Kahneman, 1974)—correlations that are specious, but which the observers see as correlating intuitively with the outcome. As far as social cognition is concerned, these invalid correlations are found in a variety of situations and are explained by the availability heuristic, where individuals "assess the frequency of a class or the probability of an event by the ease with which instances or occurrences can be brought to mind" (Tversky & Kahneman, 1974, p. 1127). That is, the easier it is to imagine a particular link, the more probable the link becomes in the observers mind's eye, particularly if the link is representative (i.e., apparently stereotypical/prototypical) of the supposed effect (refer to the representativeness heuristic of Tversky & Kahneman, 1974).

Thus, in this model, I explain two routes to leader outcomes: The actuality route and the ascription route. The actuality route explains why, objectively, a trait may actually contribute to leader effectiveness via skills (e.g., technical or social skills). The ascription route explains why, based on the representativeness heuristic, a trait allows a leader to emerge; however, this emergence will not guarantee that the leader is effective. That is, individuals emerge as leaders via the ascription route but will only be effective if: (a) they possess the actual traits that predict effectiveness (but which were not identified in selection processes that led to emergence), (b) the trait on which they were selected (e.g., height, see below) acts on the individual and observers in such a way that makes the individual more self-confident and thus more influential and effective. Finally, actual effectiveness, whether stemming from the leader or other sources, affects the attributions of leadership skills because outcomes are linked to leaders in cognitively consistent ways (Rush, Thomas, & Lord, 1977) as the representative heuristic would predict (Tversky & Kahneman, 1974); see also Calder (1977); that is, if the organization does well, observers assume that the leader (who is usually attributed responsibility of the outcome) possesses the necessary traits that drove the success.

[Insert Figure 1 here]

Note also that a trait may matter for leadership but an individual with this trait might not emerge as a leader because the relation between the trait and outcome seems counterintuitive to observers. For example, perhaps voters do not elect presidents who are very smart because voters

believe these presidents are not “in touch” enough with normal folk (thus, presidents would not be selected on intelligence but something else, like appearance). We know from statistical theory that if U.S. presidents were elected on intelligence the correlation between intelligence and presidential performance would be close to zero because all presidents would have high intelligence; that is, the restriction in range in intelligence would attenuate the true relationship between intelligence and presidential outcomes.

Data suggest that U.S. presidents are not selected on intelligence because the zero-order correlation between intelligence and U.S. presidential greatness is very strong, in fact shockingly so: r = .55 (Simonton, 2002)—note, if presidents were selected on intelligence, the correlation between intelligence and greatness would be very low (due to the range restriction in intelligence). I calculated this correlation using Simonton’s data where he modelled presidential greatness as a function of intelligence, years in office, war years in office, assassination, scandals, and being a war hero (note, controlling for these other factors Simonton reported the partial standardized regression coefficient of intelligence to be .29; however, this estimate is biased because number of years in office is endogenous and it depends on external factors like how good the president was and assassination. Removing this endogenous predictor from the model and re-estimating the regression equation increased the partial standardized beta coefficient to .41). The zero-order estimate of the relation of presidential intelligence and greatness is very similar to the estimate of the relation between intelligence and general work performance (between .51 to .62), and which increases with increasing job complexity (Salgado, Anderson, Moscoso, Bertua, & de Fruyt, 2003; Salgado et al., 2003; Schmidt & Hunter, 1996).

It is also possible that a trait does not matter for leadership (i.e., it does not correlate with performance) but the individual emerges as a leader because observers (and the leader) intuitively believe that this trait matters; these beliefs can then become self-fulfilling. Given that the data used by leadership researchers are usually perceptual measures, cognitive biases should be considered in theories regarding traits (Rush, et al., 1977). The ascription route plays a very important role in situations where the leader is distant (Antonakis & Atwater, 2002; Shamir, 1995) or in crisis situations

(Hunt, Boal, & Dodge, 1999; Merolla, Ramos, & Zechmeister, 2007). Examples of ascribed traits could include facial appearance, height, body weight, race, age (or experience) and sex.

Consider facial appearance. In a social interaction process, the appearance of an individual is one of the first variables to which an observer pays attention and observers automatically make trait inferences regarding this appearance (Hassin & Trope, 2000). Because there is variation in appearance that is intuitively (and stereotypically) linked to outcomes, individuals have categories of different kinds of leaders, as well as associated attributes (cf. Lord, Foti, & De Vader, 1984). Thus, if observers believe that a certain type of face is associated with leadership competence, they will endow the individual with the requisite characteristics.

Although this reasoning might seem farfetched Todorov, Mandisodza, Goren, and Hall (2005) recently showed that inferences of competence predicted leadership emergence in very high-stakes outcomes: actual political elections! Specifically, Todorov et al. (2005) showed naïve adults photos of two individuals (the winner and runner up of an election race) and randomly varied the position (left or right) of the photos. They then asked participants to rate the competence, leadership, and intelligence of the two individuals. Surprisingly, participants were able to reliably select (i.e., better than chance) the winner of an actual election race; inferences of competence correlated (r = .44) with margin of victory and correctly predicted about 70% of election outcomes. Note the adults could not identify the individuals in the photos (who were taken from congressional or senate election races). Interestingly, attractiveness did not predict election outcomes, probably because in this context what matters most is how competent an individuals looks. Also, in further variants of the experiment, the reliability of these snap judgments were equally valid even after exposing individuals to the photos for only 1 second!

The above results are astounding; however, they have been replicated with adults in other contexts (Antonakis & Dalgas, 2009). Even more surprising is that children exhibit the same uncanny ability to pick election winners from photos, even when these are from another country (Antonakis & Dalgas, 2009)! Given Plato's allegory of the blind-deaf-incompetent boat captain it is ironic that the children in this experiment played a game based on "The Odyssey" and then were asked to pick the "captain of their boat" (i.e., for sailing from Troy to Ithaca). Interestingly, children's choices predicted

outcomes just like in a control group of adults, and effects for adults and children were similar to those of the Todorov et al. (2005) study. These findings suggest that picking winners from pictures is a highly generalizable phenomenon. Thus, voters, who we assume to be sophisticated and who should take their voting responsibilities seriously when choosing their political leaders, appear to be using irrelevant selection criteria just like children who have very little or no experience in voting and political leadership. That adults behave like children is probably due to due to a biological face template and/or rapid early learning (Slater & Quinn, 2001), though the fact that infants can actually stereotype adults as well as other infants (Ramsey, Langlois, Hoss, Rubenstein, & Griffin, 2004; Van Duuren, Kendell-Scott, & Stark, 2003) tends to favour the nature (rather than "nurture") argument. Whatever the case, these results support the workings of the Ascription-Actuality Trait Theory.

Height is another factor that could bias assessors. Briefly, as compared to shorter individuals, taller individuals are accorded more status and might actually feel more efficacious (Judge & Cable, 2004). This finding provides a nice example showing how the ascription route goes back to the actuality route (i.e., height and esteem correlate .41), particularly because results from this meta-analysis also showed that that height correlated with performance (r = .18), income (r = .26), and leader emergence (r = .24) (Judge & Cable, 2004). However, height could be a marker of intelligence or related to intelligence through common environmental and genetic components (Sundet, Tambs, Harris, Magnus, & Torjussen, 2005). Indeed, height is related, albeit very weakly, to intelligence, though this relation seems to be decreasing with time (see Sundet, et al., 2005), probably due to environmental influences.

As for the other traits, two more that may affect leader outcomes are sex and age. Concerning sex, researchers have documented that women are disadvantaged by the fact that leadership is usually conceived of in terms of male stereotypical characteristics, making it difficult for a woman to emerge as a leader or to be evaluated favourably as a leader (Eagly & Carli, 2004). That there are fewer women in the higher echelons of power may stem from filtering mechanisms and self-limiting behaviours, particularly in contexts that are defined in male stereotypic terms (thus, the context here is a very important determinant of who emerges as a leader and how effective they may be seen). Interestingly, and paradoxically however, women have been rated as exhibiting more effective leader

behaviours than men in business settings (Antonakis, et al., 2003; Eagly, Johannesen-Schmidt, & van Engen, 2003); this finding is probably explained by the fact that only the most competent women made it through these discriminatory mechanisms (Eagly, et al., 2003). Thus, the women's edge in leadership competence is a kind of survival-of-the-fittest phenomenon.

Finally, age, is a strong proxy for work experience as well as managerial experience (r = .53, see Ostroff, Atwater, & Feinberg, 2004)--of course, managerial and leader practices are not isomorphic but they are strongly correlated (Tracey & Hinkin, 1998). Interestingly, although the relation between age and work experience is very strong, r = .84 (Antonakis, Angerfelt, & Liechti, 2009), neither age nor experience are related to leadership ability (Antonakis, 2007; Antonakis, Angerfelt et al., 2009). Individuals reasoning by representativeness (Tversky & Kahneman, 1974) will assume, quite rationally, that older individuals are more experienced; however, they also assume that experience would be related to effectiveness. For this reason, we probably observe that more experienced individuals are more likely to be appointed as leaders particularly in high-level positions (e.g., a sample of more than 10,000 CEOs from large public firms indicated that the median age was 57 years and the mean at the 10th percentile was 47 years see Nelson, 2005). However, research findings show that experience is actually *negatively* related to leadership effectiveness (Fiedler, 1970); in fact, the Ostroff et al. (2004) study found that both age and managerial experience were negatively (albeit very weakly) related to managerial performance! Discussing these results, Fiedler (1970, p. 10) noted "the belief that leadership experience enhances performance is ingrained and will not be easily shaken by 'a few studies.'" Despite these findings, the experience (or age)-effectiveness link has been almost completely ignored by leadership researchers.

The Roller-Coaster History of Trait Research

Interest in leader traits began in the 19th century when the "great man" theories emanated from studying shapers of history (Carlyle, 1846). Another example is the work of Galton (1869, p. 1) who suggested that ability is what makes individuals great and is "derived by inheritance." Early examples of systematic study of leader traits occurred in military settings. For example, characteristics such as physical qualities and intelligence, among others, were examined by Kohs and Irle (1920).

Research in traits was quite active from about the 1920s to the 1950s (Antonakis, Cianciolo, & Sternberg, 2004). Two influential reviews established that there were traits associated with leadership (Mann, 1959; Stogdill, 1948); however, traits soon fell out of fashion with leadership researchers because these studies gave conflicting signals about the results, which were consequently interpreted in a pessimistic way (Lord, De Vader, & Alliger, 1986; Zaccaro, Kemp, & Bader, 2004). Textbooks in industrial psychology and organizational behaviour made sweeping remarks about the inutility of leader trait research, and this obviously had a very negative impact on scholars and students. Due to other reasons as well, research on leadership stagnated and there was not much hope for leadership as a discipline (Greene, 1977; McCall & Lombardo, 1978; Schriesheim & Kerr, 1977); there were even calls for a moratorium on research in leadership (Miner, 1975).

The early efforts to find traits associated with leadership were plagued with methodological errors (Zaccaro, et al., 2004). Also, the appropriate statistical techniques (e.g., meta-analysis) were not available to synthesize the results of different studies. With more reliable instruments, better designs, and more sophisticated methods, the tables have turned on the sceptics. Three decades after the misinterpreted reviews of Mann (1959) and Stogdill (1948), leader individual differences returned to prominence on the leadership research radar. A meta-analysis reanalyzed the Mann data and established that intelligence was, in fact, strongly linked to leader emergence (Lord, et al., 1986).

Two other studies were also instrumental in demonstrating that variance unique to the individual (i.e., trait-based) was related to leadership (Kenny & Zaccaro, 1983; Zaccaro, Foti, & Kenny, 1991). Specifically, using a rotation design (varying tasks and group members) Kenny and Zaccaro (1983), found that between 49% and 82% of the variance in leader emergence was attributed to the target leader. This result was replicated by Zaccaro et al. (1991), who found that 59% of the variance in the emergence of leadership was traceable to individual differences in leaders. In the meantime, another independent line of research led by McClelland (McClelland, 1975; McClelland & Burnham, 1976) and House (House, Spangler, & Woycke, 1991) established that implicit motives (i.e., subconscious drives or motivators) were linked to leadership effectiveness; however, this research line was not well known and had a limited effect on leadership research.

At this time, the study of traits is back in fashion (Antonakis et al., 2004; Lowe & Gardner, 2001; Zaccaro, et al., 2004) .One might say that research in leader individual differences is "hot," in fact too hot. That is, there is perhaps too much research being done in this area without appropriate tests to disentangle whether these new traits make a unique contribution in predicting leadership beyond current established traits; in psychology or other scientific fields a show of "eureka" must be genuine (i.e., that one truly found something new and different from the past that has practical utility). To better understand which traits matter, we need to have a clear sense of the criteria that should be used in determining whether the addition of a new trait is beneficial for leadership research, as I discuss below.

On the Validation of Traits Models

Before researchers can make claims that a particular trait model is predictive of leadership they must pit their trait against *tough* but *fair* competition. Analogously, one cannot claim to be a fast runner unless one beats runners who are considered to be fast or beats a specific benchmark in a particular distance; also, the rules of the race must be established such that one does not have an unfair advantage over the competition (e.g., making one runner run with a full rucksack). Thus, one cannot claim that a trait is somehow different and better than established traits if specific evidence is not provided to support these contentions and test the new trait against tough competition in an open and honest way. For example, finding that a particular trait--which is supposed to be different from intelligence and personality--correlates with leader effectiveness is a useless and wasteful endeavour if in that particular study (or in previous studies) the researchers did not control for intelligence and personality.

In the table I provide some brief guidelines that will be useful for readers when considering claims about the utility of certain trait models. I borrowed these guidelines from my previous writings (Antonakis, 2003, 2004; Antonakis, 2009; Antonakis, Ashkanasy, & Dasborough, 2009) to which readers should refer for details. In these works, I was rather critical about the very loose standards that some have used to prop-up "new-discovered" trait models. Note that the ten steps I introduce below will ensure that strong deductions and clear interpretations can be made about the utility of a particular trait model. Also I am not suggesting that a particular study must demonstrate evidence of all these

steps in every publication—that would be an absurdly high standard to use. However, for a construct to be taken seriously, the collective literature (i.e., previous research on the construct) must show evidence that the construct has passed these steps.

[Insert Table 1 here]

These 10 steps are not new nor are they exorbitantly taxing to implement across a research field. Establishing construct legitimacy takes time and effort; science and practice will benefit only if research designs are strong.

Traits that matter: The usual suspects!

There are dozens and dozens of traits that have been linked to leadership; unfortunately, many of them are not valid predictors. Only a few have endured and generated enough research that has been analyzed meta-analytically. In this regard, I will be conservative and select models that have extensive histories behind them and enough data to allow us to make valid conclusions (i.e., examined meta-analytically and with evidence of having passed the necessary validation steps noted above).

The two major domains of traits that predict leadership are ability and personality, just as Plato suspected. One might ask: After more than 2000 years is that the best we can do? At this point in time, this is the best we have. It has taken time to refine instruments to such a point that we can begin to predict leadership quite well. To put this point in context many propositions stemming from thinkers in antiquity (e.g., Aristarchus's heliocentric theory of the galaxy, Pythogoras's assertion that the earth was a sphere, Eratosthenes's estimation of the earth's circumference) were only confirmed in relatively recent times. Measuring latent constructs like personality with instruments that are not as easy to quantify as length is has proven to be difficult; however, with modern psychometric theory and statistical methods, we have now made considerable advances. What is also needed are creative ideas about constructs that will predict incremental variance beyond the established constructs. As indicated elsewhere, we should be open to new conceptions of individual differences and how they are measured (John Antonakis, et al., 2004) and look forward to seeing alternative individual-difference models proving their worth one day, as long as they have been tested thoroughly.

General intelligence

One of the traits that has stood the test of time and is strongly related to leadership is general intelligence. General intelligence or "*g*" reflects the ability to learn, to abstract, to process information and is the single most important predictor of work success (Gottfredson, 1997, 2002; Schmidt & Hunter, 1998, 2004). Also, *g* predicts performance in the U.S. presidency and in jobs where complexity increases. Meta-analytic results show that it predicts leadership emergence (r = .50, Lord, et al., 1986); also, when measured objectively (i.e., paper and pencil tests) *g* also predicts objective leadership effectiveness (r = .33, Judge, Colbert, & Ilies, 2004). Interestingly, the correlations between measures of perceived effectiveness and emergence were much lower (apparently, observers are not very impressed with smart individuals; I hinted this when discussing the ascription-actuality trait theory). These correlations are pretty impressive; currently there are no other traits that have been examined meta-analytically that relate as strongly to leadership emergence and effectiveness.

Following the precepts of cognitive-resources theory, Judge et al. (2004) also showed that *g* predicted leadership outcomes in situations where leader stress was low but not when it was high. As noted elsewhere (Antonakis, et al., 2009), this meta-analysis did not include the 13 samples of Fiedler and Link (1994) wherein stress, *g* and their interaction predicted outcomes. Because methods to synthesize interaction effects for continuous measures are available (Kanetkar, Evans, Everell, Irving, & Millman, 1995) they could have been used in the meta analysis by Judge et al. (2004). In fact, Fiedler and Link (1994) showed that in the majority of their samples, both IQ and stress had positive slopes and the interaction was positive too (see their Table 6.3), suggesting that IQ had a positive slope in high-stress situations as well as in low stress situations. In fact, the relation in high-stress situations is actually higher. Referring specifically to leader performance in situations with interpersonal stress, Fiedler (1995, p. 52) noted: "Our studies do not support the hypothesis… that intelligence tests are not useful in predicting leadership performance in complex or intellectually demanding tasks. On the contrary… intelligence tests seem to predict performance somewhat better in intellectually demanding and complex tasks, than in simple or routine ones."

Finally, despite strong meta-analytic evidence for the importance of intelligence for leadership, some textbooks still do not highlight the importance of *g* for leadership (e.g., Yukl, 2006);

reviews written by specialists in individual differences, however, (e. g., Spangler, House, & Palrecha, 2004; Zaccaro, et al., 2004) strongly highlight the importance of intelligence and the fact that this construct has been given short shrift in the literature.

Personality: The big five

Recently, there has been a resurgence of research linking personality to work outcomes. This revival has occurred primarily because the previously fragmented ways of describing personality have been grouped around five big traits (see Digman, 1989; Goldberg, 1990) although some argue for six big traits (Lee & Ashton, 2004, 2008). I will focus on the big five model, which has a longer history and meta-analyses linked to leadership.

This reappearance of personality research in psychology is partly due to the research program of McCrae and Costa and their venerable NEO-PI (Costa & McCrae, 1992; Loehlin, McCrae, Costa, & John, 1998; McCrae & Costa, 1987, 1997). It is important to note that apart from one factor (openness), which is modestly related to intelligence, the rest of the personality factors are unrelated to intelligence (Goff & Ackerman, 1992) and thus are non-redundant when added to predictive models that include intelligence.

Below, I describe the five-factor model using Costa and McCrae framework (1992). Note, correlation coefficients are meta-analytic ones based on results from Judge et al. (2002). The first correlation refers to the correlation of personality with leader emergence and the second with leader effectiveness (underlined coefficients have 95% confidence intervals and 80% credibility intervals that exclude zero):

1. Neuroticism (r = -.24 and -.22), which refers to anxiety, demonstration of anger, depression, self-consciousness, and vulnerability. Theoretically, leaders should have low levels of neuroticism.

2. Extraversion (r = .33 and .24) tapping warmth, gregariousness, assertiveness, being active and adventurous, and being positive. Theoretically, this factor should be the most important predictor of leadership.

3. Openness (r = .24 and .24), which includes imagination, being aesthetic, open to emotions, having many interests, curiosity, and unconventionality. Leaders should be forward-thinking and visionary; thus, this factor should be an important antecedent of leadership.

4. Agreeableness (r = .05, .21), whose facets include being trustful of others, being frank, soft-hearted, compliant, modest, and compassionate. Intuitively, leaders should be nice and empathetic; however, such types of individuals may find it difficult to take a stand on issues or to confront others.

5. Conscientiousness (r = .33, and .16), which includes self-confidence, orderliness, dependability, goal orientations, self-discipline, and being deliberative. We would expect successful leaders to be high on conscientiousness.

Note, given that the personality factors are correlated, it is important to predict leadership in a multivariate model (i.e., to examine the partial regression coefficients). As shown by Judge et al. (Judge, et al., 2002), together the big five predict leadership emergence well (multiple R = .53), with the following significant betas (standardized): extraversion (.30), openness (.21), agreeableness (-.14), conscientiousness (.36). They also predict leadership effectiveness quite well (multiple R = . 39), with the following significant betas (standardized): extraversion (.18), openness (.19).

A second meta-analysis has linked the big five to transformational leadership (Bono & Judge, 2004); I am noting these results given that transformational leadership is currently the most researched leadership theory. Here are the correlations for direct measures of the big five, which are less strong than those noted above (underlined coefficients have 95% confidence intervals and 80% credibility intervals that exclude zero): neuroticism (r = -.16), extraversion (r = .23), openness (r = .09), agreeableness (r = .12) and conscientiousness (r = .11). I do not include the multivariate results because Bono and Judge did not report the partial coefficients of each of the factors.

Implicit motives

This model of personality is included with caution because as of yet, there has not been a meta-analysis examining its predictive validity for leadership. Implicit motives, which include need for power, affiliation, and achievement, as well as responsibility disposition, seem to be different from explicitly measured traits like the big five factors (Winter, John, Stewart, Klohnen, & Duncan, 1998). There is much research showing that high levels of need for power as well as low levels of affiliation and achievement are important antecedents of leadership (Antonakis & House, 2002; De Hoogh et al., 2005; House, et al., 1991; Spangler & House, 1991; Winter, et al., 1998). Research in this area should

be consolidated meta-analytically to determine the population estimates. Given the strong effects so far, it is likely that this model passes the meta-analytic test.

The Suspect Traits That Don't Seem To Matter Much (based on current evidence)

As mentioned before, there are many traits that might seem to be useful, particularly to practitioners, but have not yet demonstrated utility when subjected to vigorous tests. I will highlight a few of these tests. Readers may refer to Zaccaro and Horn (2003) specifically regarding the science-practice divide and the reasons why the important traits are not taken as seriously as they should be by practitioners whereas the ones that are more intuitively appealing are (see also Rynes, Colbert, & Brown, 2002).

Emotional intelligence

This trait has probably garnered the most interest for practitioners; however, research using strong designs has not demonstrated that this trait is needed for leadership (i.e., following the steps of validation I noted above) (Antonakis, et al., 2009). Zaccaro and Horn (2003, p. 779) had this to say about emotional intelligence (as well as the MBTI, see below): "A common phenomenon and problem in leadership practice [and I would add research] concerns undue reliance on popular ideas and fads without sufficient consideration given to the validity of these ideas. Recent examples include the Myers–Briggs Type Indicator . . . and . . . emotional intelligence."

The only performance-related (including work performance) meta-analysis that has been conducted thus far on emotional intelligence is that of Van Rooy & Viswesvaran (2004). Granted, work performance and leadership are not the same thing; however, a measure that is purported to predict performance in various domains should predict work performance and leadership (as ability and personality tests currently do). Thus, it is informative to see how emotional intelligence does in predicting general and work performance. Results are not as stellar as its proponents would like it to be. The meta-analysis found that the well-respected Salovey-Mayer MEIS ability scale correlated only .19 with performance though self report emotional intelligence measures had a slightly higher correlation (overall, emotional intelligence measures correlated .23 with work performance). Results for incremental validity were not encouraging: "unlike with personality, EI did not evidence incremental validity over GMA. However, GMA did significantly predict performance beyond that

explained by EI. Thus, the claims that EI can be a more important predictor than cognitive ability (e.g., Goleman, 1995) are apparently more rhetoric than fact" (Van Rooy & Viswesvaran, 2004, p. 87)

These results may be rather surprising; however, at this time there is *no evidence* that emotional intelligence matters much beyond general intelligence and personality for leadership (Antonakis, 2003, 2004; Antonakis, 2009; Antonakis, et al., 2009). Emotional intelligence simply correlates too strongly with personality and/or cognitive ability (depending on the measure) and not enough with outcomes to demonstrate incremental validity. Future research must focus on developing better instruments that are not linearly related to *g* and the big five before emotional intelligence can prove its worth.

Self-monitoring

A meta-analysis has established that self-monitoring is linked to leadership emergence, though the correlation is only .18 (Day, Schleicher, Unckless, & Hiller, 2002). This meta-analysis is limited because the authors did not control for the big five personality factors (which theoretically, may be strongly related to self-monitoring). Unfortunately, there is not much research that has examined the extent to which the full big five together (i.e., the multivariate effects) predict self-monitoring (while also correcting for measurement error). Thus, it is possible that self-monitoring might not demonstrate incremental validity over the big five. At this time, self-monitoring is at the same level as emotional intelligence in terms of not having demonstrated incremental validity, even though this construct has a longer history.

Myers–Briggs Type Indicator (MBTI)

The MBTI is enormously popular with practitioners. However, the psychometric properties of this instrument—which were not developed by psychometricians—have been strongly criticized (McCrae & Costa, 1989; Pittenger, 1993; Stricker & Ross, 1964), particularly regarding the apparent typology structure. As concerns leadership, results regarding links between the types and leadership are contradictory (Zaccaro, et al., 2004) and there is no particular "type" that is linked to leadership (Zaccaro & Horn, 2003). More rigorous research is required in this area before conclusions can be drawn (Gardner & Martinko, 1996).

The Suspect Traits That Definitely Don't Matter

I do not want to waste readers' time and valuable publishing space discussing constructs that are totally irrelevant; however, I do think it is worthwhile to briefly show how easy it is to sell models that have not at been validated. The Herrmann Brain Dominance Instrument (HBDI), which is widely-used tool, is believed to be useful for leadership. However, there is hardly any research testing this instrument and there no evidence for its validity (Ferrara & van Lingen, 2001). Another model, particularly popular with practitioners is the DISC personality model, which is apparently based on the four Hippocratic types! I could not identify any research on this model, though plenty of claims about its validity are on the internet. As with the HBDI, this model does not have the requisite research behind it to be used in industrial settings. There are probably hundreds of trait models that are marketed as leadership predictors (readers should search the web to see just how many models proliferate). There are also hundreds of methods or approaches like Neuro-linguistic programming (NLP), whose proponents claim to be useful for predicting leadership or for developing leadership skills. Alas, NLP continues to persist in the world of practice even though psychologists have stopped taking this construct seriously a while back (Gelso & Fassinger, 1990; Sharpley, 1987).

The statistical utility of traits

Because traits are exogenous in predictive models (i.e., they depend on genes and are not caused by any other variables in the model), they have another very interesting property: They can ensure that coefficients of endogenous (mediator) variables are consistent in predicting a dependent variable. Estimates could be inconsistent for four reasons: (a) common methods variance, (b) backward causality, (c) measurement error, or (d) omitted variables. Thus, an exogenous source of variance is needed to ensure that accurate estimates are obtained. For example, suppose one wished to examine whether leadership style predicts effectiveness. If there is a problem regarding the two variables because of any of the reasons above, one way to recover the consistent estimate is to model the following system of equations: *g* + big five → leadership style → effectiveness.

Estimates become inconsistent because the error term in the dependent variable may correlate with the endogenous variable (see Foster & McLanahan, 1996; Gennetian, Magnuson, & Morris, 2008; Kennedy, 2003). If the endogenous variable correlates with the error term, even with an increasing sample size the estimate of the relation will not converge to the true estimate (i.e., it is

inconsistent). Why? Because the ordinary least-squares (OLS) or maximum likelihood (ML) estimators force the residual of the endogenous variable to be orthogonal to the regressor. Thus, to satisfy the orthogonality assumption, the estimate of the regressor is changed accordingly (and becomes inconsistent).Two-equation or multi-equation models can be estimated using various estimators that will provide consistent estimates (if model assumptions are met): limited-information estimators (e.g., two-stage least squares regression, 2SLS—this estimator is also called the instrumental variable estimator or IV estimator); limited information maximum likelihood (LIML); or maximum likelihood (ML), which is considered a "full information" estimator.

What these estimators do is rather straightforward; I will discuss their working in terms of the 2SLS estimator (the principle is slightly different with ML, though the outcome is similar if the model is correctly specified). Basically, the estimator ensures that the correlation between the residual term in the dependent variable is unrelated to the endogenous regressor (thereby providing consistent estimates). The statistical "trick" that is used by the estimator is to replace the troublesome regressor (i.e., the endogenous one that is correlated with the error term) with its predicted value (i.e., the first-stage estimate where the endogenous regressor is regressed on the exogenous variable/s). Given that the instrument, that is, the exogenous variable, hence the term "instrumental variable regression," is exogenous, it will not correlate with the residual term. If the instrument is not correlated with the error term then this procedure isolates the portion of variance in the endogenous variable stemming from the instrument that predicts the dependent variable (but which is unrelated to unmeasured or confounded effects). In other words, the endogenous regressor only affects the dependent variable through the instruments' effect on the endogenous regressor.

Conclusions and future directions

As I have demonstrated in my review, there are traits that are useful in predicting leadership; thus, these traits will be utile in selecting individuals who will most likely be seen as leader-like as well as more effective in positions of leadership. Using valid leader trait models has important economic implications (there are of course ethical implications too, which I will not get into).

A potentially useful area to look into is how configurations or sets of traits predict leader outcomes (Foti & Hauenstein, 2002; Smith & Foti, 1998)—research in this domain is underdeveloped

as is research using sophisticated latent variable models including latent class or latent profile analysis (see Nylund, Asparouhov, & Muthén, 2008). As I mentioned before, another very important use for trait models is that they can be used as exogenous sources of variance in two-stage or multi-equation models. Unfortunately, this is a very much underutilized technique in management and applied psychology settings, but one that is standard in econometrics and which could prove useful for leadership researchers.

Also, to better understand the leadership phenomenon, leadership researchers must reach out to other disciplines that study leadership and individual differences or related areas. Top contenders for cross-disciplinary work that might engender paradigm shifts in our field include behavioural economics, neuroscience, behavioural endocrinology, and genetics.

In sum, more research is needed in what has been a fruitful area in leadership. Although there are models that do a reasonably good job at predicting leadership, research will obviously need to continue to sharpen measurement models and also to look for new, possibly multidisciplinary models that might go beyond traditional theorizing and methodologies.

My hope is that this review will help to stimulate new ideas in what is a fascinating topic of research that has important societal implications. We need to better understand what make leaders great; we also need to better understand what makes them corrupt. The better we understand what predicts leader outcomes the more likely we will improve society. As noted by Bennis (2004, p. 331), who has, over the decades, demonstrated remarkable perspicacity,

> it is important to remember that the quality of all our lives is dependent on the quality of our leadership. The context in which we study leadership is very different from the context in which we study, say, astronomy. By definition, leaders wield power, and so we study them with the same self-interested intensity with which we study diabetes and other life-threatening diseases. Only when we understand leaders will we be able to control them.

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Figure 1: The ascription-actuality trait theory of leadership

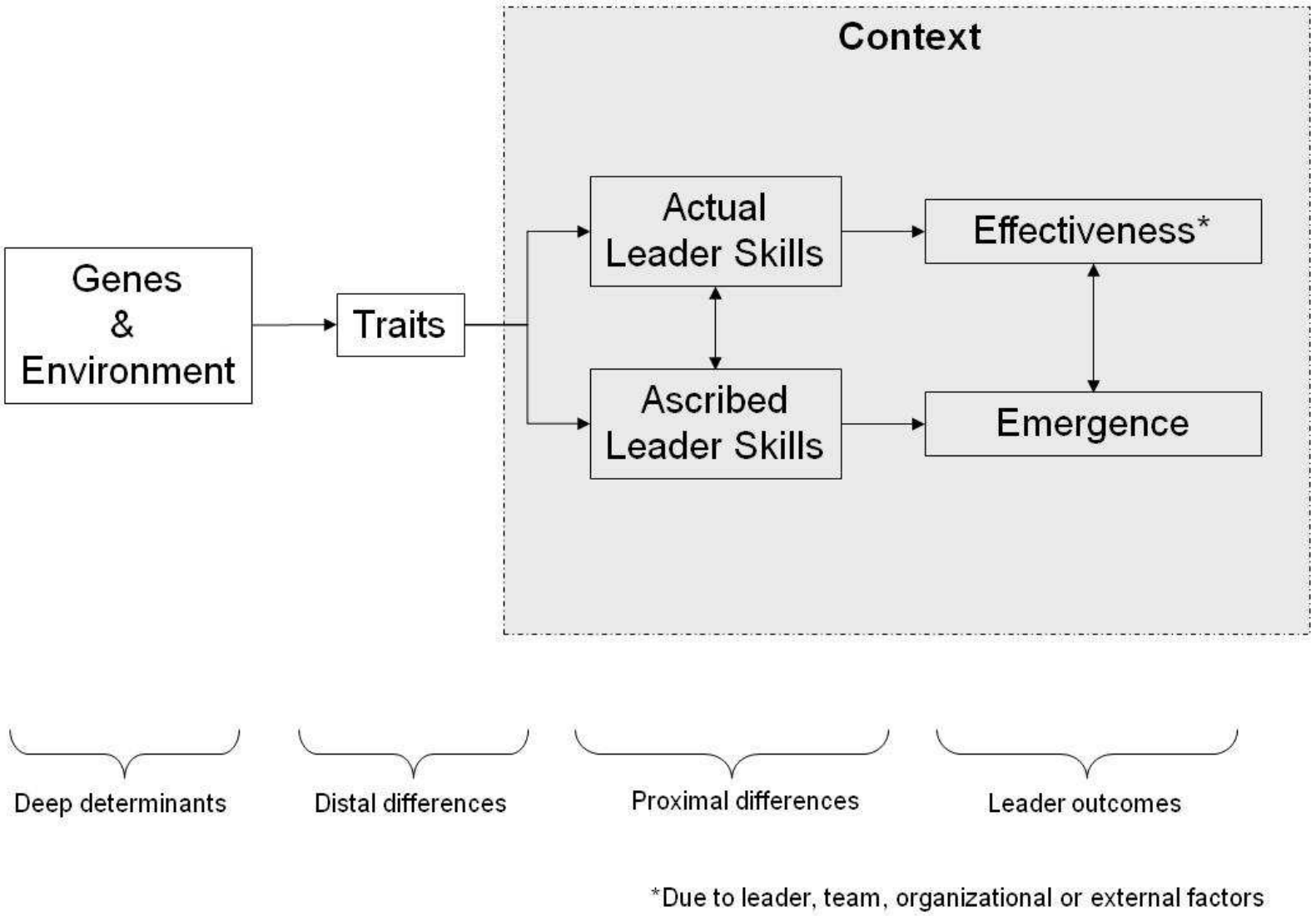

Table 1: Ten steps for validating trait measures

Ten steps for validation	Explanation
Type of validity	
1. Construct validity	Indictors of construct must be associated with constructs as specified by theory (tested using confirmatory factor analysis)
2. Criterion validity*	Target construct predicts an outcome
3. Discriminant validity*	Target construct does not overlap highly with theoretically distinct constructs
4. Convergent validity*	Target construct is related to theoretically similar constructs
5. Incremental validity*	Target construct predicts variance in outcomes while controlling for competing constructs (this is the "litmus" test)
*these tests must control for measurement error, which biases coefficients and makes them (as well coefficients of other independent variables) inconsistent	
Design issues	
6. No leader self reports	Do not use leader self-ratings to rate leadership; uses others' observations
7. Avoid common-methods variance	Obtain leadership measures from one source (e.g., others) and leader individual differences (e.g., IQ) from leader
8. Use measures designed to tap constructs being studied	Do not pass-off measures of similar constructs as target construct
9. Use practicing leaders	To generalize to leaders use data based on real leaders and not on students
10. Data and analysis	Have large samples, correctly specify model, and control for nestings (e.g., use HLM-type models)