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How to Win Elections: An Evolved Psychological Model of Context, Facial Cues, and Message Predicts Leadership Emergence

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Chapter 5

The Age of Exploration and Exploitation: Younger Leaders are Preferred for Change and
Older Leaders are Preferred for Stability*

*This chapter is based on Spisak, B.R., Grabo, A., & Van Vugt, M. (in preparation) The Age of Exploration and Exploitation: Younger Leaders are Preferred for Change and Older Leaders are Preferred for Stability

Introduction

Fundamentally, change is about adapting to diverse and variable environments. At an ultimate level taking advantage of these opportunities provides us with the components necessary to replicate our genetic code (resources such as food, water, and shelter). Our ability to explore on a large-scale is something that makes us distinctly different from our non-human primate relatives. In this chapter, the ability to coordinate change and group movements will be investigated. Evidence will be provided to show that adaptive responses for maximizing fitness via territory exploration and expansion favors younger leaders with an optimal combination of physical ability, skill, ambition, and curiosity. Further, it is suggested that as these young leaders senesce, and the ability to acquire status by leading highly energetic group activities is inhibited, a threshold will be reached that encourages a strategic shift to exploitation of established systems and leading group stability – which is also an important requirement for success. Finally, assuming these contingent leadership prototypes are evolutionarily stable, it is argued that younger leaders are implicitly associated with change (exploration) and older leaders with stability (exploitation).

The Evolution of Exploration-Exploitation Leadership

The issue of change versus stability in organizational sciences is nothing new. The tradeoff between exploration and exploitation is a commonly cited and frequently researched topic (see Jansen, Vera, & Crossan, 2009). The dilemma is interesting because it requires a coordinated decision for the group to invest in risk taking and innovation to remain adaptive and competitive in changing environments, or to create stability and minimize the negative costs associated with uncertainty by refinement and execution of preexisting systems - the consistent benefits of exploiting best practices versus the exploratory requirements of dynamic environments (March, 1991).

It appears both coordination strategies are essential to the healthy maintenance and development of social networks. Without exploitation, groups lack the stability required to learn and work towards optimizing their environment. This puts them at a disadvantage relative to groups that are better able to share information, refine acquired knowledge, and execute coordination. Conversely, groups that cannot effectively explore new opportunities risk becoming obsolete and unable to adapt. This also creates a disadvantage in contrast to groups that have an ability to react quickly and take advantage of new opportunities.

When such fitness relevant coordination problems remain consistent, social groups appear to adopt leadership and followership strategies to efficiently and effectively meet the requirements of the situation (see Spisak et al., 2011). Thus, given the inherent differences between change and stability (or exploration and exploitation), it is expected different leadership prototypes will be selected for. Such cognitive leadership prototyping is a heuristic method for increasing group cohesion by facilitating rapid emergence of appropriate leadership (e.g., Van Vugt & Spisak, 2008; Spisak et al., 2012).

Previous work has shown that transformational leadership is preferred for exploration and transactional for exploitation (Jansen et al., 2009). This is not surprising considering that transformational leadership fosters vision, ingenuity, and risk-taking whereas active transformational leadership elicits reliability, regulation, and stability (Denison, Hooijberg, & Quinn, 1995; Gibson & Birkinshaw, 2004; Vera & Crossan, 2004). These distinct leadership traits related to exploration versus exploitation represent specific leadership prototypes and individual leaders will likely gravitate towards one or the other – the same way certain individual athletes tend to become either sumo wrestlers or horse jockeys depending on obvious size differences.

Change, Stability, and Biological Age

One such individual difference potentially defining these change and stability leadership prototypes is age. Though there is a significant gap in the leadership literature on functional cues of age (Zacher et al., 2011), it has been shown that younger leaders appear to more often exercise transformational leadership and older leaders transactional leadership (Doherty, 1997). Why is this?

By taking an evolutionary approach to the adaptation of leadership, the black box connection between age, transformational-transactional leadership, and its relevance to the exploration-exploitation tradeoff can be made clear. An evolutionary perspective emphasizes the ultimate importance an age/exploration-exploitation connection has had (and continues to have) on our success and as a result provides a lens to view previously unseen connectivity.

The Origins of Status via Exploration-Exploitation

I start by investigating the human origins of exploration and exploitation and who is likely to emerge as a leader in these diverging group requirements. For the overwhelming majority of hominin evolution we were nomadic, engaged in exploration of resource opportunities eventually leading to dispersal on a global scale (see Rolland, 2010). The need to find such resources in competitive environments was (and is) a strong selection pressure - as is the proximate need to exploit consistent resource pools to create stable environments necessary for raising offspring (see Spisak et al., 2011).

Interestingly, this tradeoff parallels ecological strategies of organisms to select food that maximizes their rate of energy intake (see Optimal Foraging Theory; MacArthur & Pianka, 1966). If a resource is readily available and has a high payoff relative to cost of acquisition then it will be exploited. Exploration will occur when resource density decreases to a level that allows for gain (relative to cost) from searching. Indeed, these costs and benefits associated with various alternative resources are a strong predictor of hunter-gatherer

decision making (Hill, Kaplan, Hawkes, & Hurtado, 1987). Consequently, it appears this tension between exploration and exploitation is an evolutionarily consistent coordination pressure selecting for a number of distinct adaptations to address the specific requirements of these essential situations.

Regarding exploration, our ability to engage in endurance running (ER) is significant in the evolution of hominins (Carrier, 1984; Bramble & Lieberman, 2004). ER provided our ancestors with a competitive advantage through a number of adaptations such as reduced body hair and sweating which allowed for running extended distances even at relatively high external temperatures (Bramble & Lieberman, 2004). Arguably ER contributed to our membership in the predator guild through the practice of persistence hunting (i.e., the ability to run prey animals to exhaustion) as well as competitive scavenging by quickly covering large distances when opportunities arise - particularly during midday when other scavengers are less active (Liebenberg, 2006; Liebenberg, 2008). Whatever the specific benefits of ER, this unique skill provided access to a successful niche.

However, even though coordinated exploration such as persistence hunting and competitive scavenging enhanced fitness there was also cost in terms of physical energy. Thus, assuming exploration benefited from leadership (as is the case with modern exploratory activities; Jansen et al., 2009) and decision making is in part driven by an optimal foraging strategy, certain individuals would be better suited for this energetic task and likely emerge as a leader. One key aspect is the vigor and stamina associated with relatively younger age. In an environment of persistence hunting, competitive scavenging, and other exploratory activities, successful followers should prefer physically fit leaders with the endurance to maximize the benefits of change. Considering the importance of this association throughout human evolution it has likely become part of a follower heuristic for leadership selection during change (i.e., *if time of change, then young leader*).

The tradeoff to this exploratory tendency is stability (Spisak et al., 2011). This, as noted, relates to the requirements of exploitation (e.g., optimizing established resources by increasing efficiency, refinement, and execution of the processes necessary to harvest this benefit; March, 1991). This form of leadership benefits the group by taking advantage of acquired knowledge and best practices stored within an experienced leader that can be transmitted via social learning (e.g., “copy-successful-individuals”; Mesoudi, 2008). For example, in many cultures, older individuals are sought after to settle disputes that may threaten the stability of the community (Nicholson, 2005). Moreover, older individuals are more likely to maintain status within a well-established and stable political or religious institution, while younger individuals are more likely to take risks on something new (Lehman, 1953). Consider that while nearly half of the world's political revolutionaries were younger than 35, nearly all political leaders achieve their positions after the age of 40 and most nascent entrepreneurs tend to be younger than 35 whereas more than half of the CEO's of Fortune 500 companies are between 50-59 years old (Rejai & Phillips, 1979; Korunka, Frank, Lueger, & Mugler, 2003; Blondel, 1980). In this scenario the follower heuristic shifts (i.e., *if* need for stability, *then* old leader).

One major difference between younger and older individuals is that older individuals have been shown to be significantly better at reasoning about social conflicts (Grossmann et al, 2010). Thus age could serve as an honest biological cue indicating one's ability to secure stability within a group. Further, considering the older dominance leadership connection of the previous chapter, perhaps one tactic for these hawkish leaders to maintain status in competitive environments is to create a need for stability through the threat of an enemy.

The second factor that may have contributed to the development of these preferences is that age may be a reliable biological indicator of one's general level of activity/passivity. That is, older people tend to have less physical energy to expend on activities like hunting or

foraging for food, or making contact with neighbors (Vaughan, Zurlo, & Ravussin, 1991; Piers et al, 1998). It would be in an older person's best interest then to seek and maintain leadership status within an already established niche (exploitation), whereas a younger individual would be better off looking to raise their status by engaging in a more high-risk, high-energy activity such as persistence hunting and scouting for new resource opportunities (exploration).

In addition, diverging neural substrates are preferentially activated for managing exploration and exploitation (e.g., Daw, O'Doherty, Dayan, Seymour, & Dolan, 2006) suggesting specific circuitry has evolved to help us quickly act upon the tradeoff. Further, given our social nature for problem solving and the selection pressure for efficiency (via leadership) in competitive environments, perhaps imbedded within these decision-making neural systems are context-specific prototypes for young-change and old-stability leader heuristics.

Convergence and Hypothesis

I have attempted to provide a clear connection between exploration-exploitation, transformational-transactional leadership, and specific age differences. It has been shown that the tradeoff between exploration and exploitation is an evolutionarily consistent balancing act between change and stability, and to address these coordination problems different leadership prototypes tend to emerge. At a proximate level, a relationship exists between transformational leadership and exploration, given the emphasis on fostering vision, ingenuity, and risk-taking. Whereas the requirements of exploitation relate to the qualities of transactional leadership such as reliability, regulation, and stability. From an evolutionary perspective, this connection between change and stability appears to be aligned with gaining versus maintaining status as mediated by physical ability and age. Indeed, research has shown

that younger leaders tend to exhibit more transformational leadership and older leaders transactional leadership (Doherty, 1997).

My initial question is whether followers are implicitly aware of these ancestral leadership contingencies when activated. I expect that younger-looking leaders will be preferred for times of change and older looking leaders when a need for stability is made salient. To test this hypothesis, I conducted a combination of two face perception experiments using both composite images manipulated to look older and younger as well as individual faces morphed to alter the appearance of age. As I have shown in the previous chapter on age and status, age as represented in the human face is a natural signal of social information for making leadership decisions, and is quite a persistent neurological mechanism even when other face recognition capabilities are diminished.

Experiment 5.1

Method

Participants. Sixty students from the VU University Amsterdam (32 male, 28 female; $M_{\text{age}} = 22.43$, $SD = 6.74$) participated in the experiment and received either money or course credit.

Materials and procedure. The same old and young, male and female faces used in Experiment 4.1 of the previous chapter were utilized to create the same 4 face categories (i.e., old male, young male, old female, and young female; Figure 6). The design was entirely within-subjects, with each participant viewing all materials and completing the same questionnaire. Again, this allows to imbed the variable of interest (i.e., age) within a distracter variable (i.e., gender). Participants completed a pen-and-paper survey in which they were presented with 7 faces from each face category – one face per page. Presentation order of the faces were counterbalanced. Participants were asked to rate each face in particular as “a leader who could maintain stability during financially difficult times” and “a leader during times of

technological change.” Participants answered the same questions for each face using 7-point Likert-type scales (1 = *very much no*, 7 = *very much yes*). Rating scales were also counterbalanced. Following the leader ratings, participants were debriefed and thanked.

Results and Discussion

In order to test the hypothesis that participants would rate older faces as better leaders for maintaining stability and younger faces as better for initiating change, I computed the overall leadership ratings for younger versus older faces. I therefore collapsed the individual ratings into two mean ratings: (1) *congruent* ratings, which was composed of stability leadership ratings of older faces and change leadership ratings of younger faces, and (2) *incongruent* ratings, comprised of stability leadership ratings of younger faces and change leadership ratings of older faces. I then entered the leader-ratings into a repeated-measures model. As expected, the results indicated that overall, participants indeed rated the congruent face pairings as more leader-like ($M=4.24$, $SD=.44$) than the incongruent pairings ($M=4.03$, $SD=.52$; $F[1, 59] = 11.34$, $p = .001$, $\eta^2 = .161$).

To control for the potential confound of participant gender, I conducted another repeated-measures analysis and the results of this analysis showed that there was no significant interaction between gender of the participant and their leader ratings in congruent versus incongruent pairings ($F[2,58]= 2.87$, $p = .096$, $\eta^2 = .047$).

As a final analysis, I investigated whether the distracter variable (i.e., gender of the face) had an effect for either the congruent (i.e., old –stability leadership, young-change leadership) or incongruent leader ratings. In fact, I found that for congruent leadership, participants rated male faces more leader-like ($M = 4.51$, $SD = .64$) than female faces ($M = 3.96$, $SD = .63$; $F[1,59] = 21.74$, $p = .000$, $\eta^2 = .269$). For the incongruent leader pairings, I found a similar male facial bias ($M = 4.23$, $SD = .72$) over female faces ($M = 3.81$, $SD = .62$;

$F[1,59] = 14.90, p = .000, \eta^2 = .202$). The results perhaps reflect a male bias for these particular leadership situations.

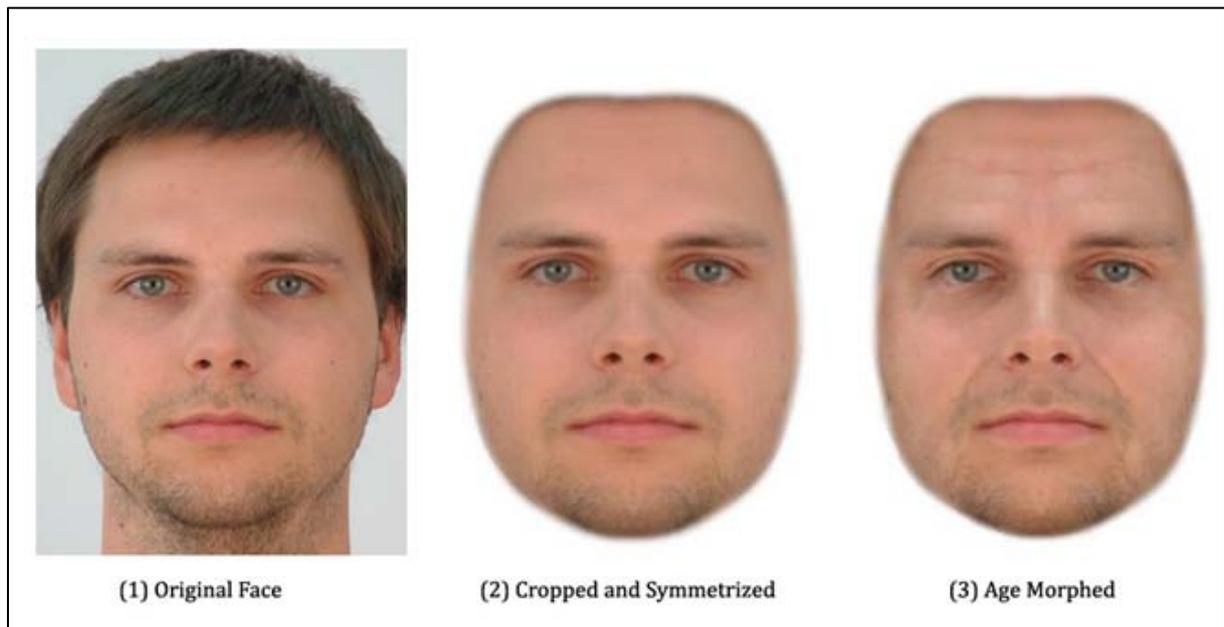
The results of this experiment supported my hypothesis that participants would prefer younger faces for leadership during change and older faces for stability (i.e., congruent) rather than the converse (i.e., incongruent). However, I felt my results could be subject to the criticism that the effects were merely relative judgments that were enhanced by the nature of the experimental design that included 30 faces from which to make comparisons. In order to address this potential shortcoming, I wanted to conduct a stricter test of my predictions by conducting a second experiment in which the older versus younger faces were treated as a between-subjects rather than within-subjects factor. I reasoned that if the same pattern of preferences for congruent versus incongruent pairings could be found when participants viewed only older or younger faces, it would lend stronger evidence for my claim that such patterns represent fundamental underlying heuristic decision rules.

Experiment 5.2

Method

Pilot. Faces of leader candidates (all males) were taken from the neutral expression pose of the CVL face database (Solina et al., 2003). In a separate online pilot 40 of these faces were used to determine which would be rated as most neutral in terms of attractiveness, age, and masculinity-femininity. The faces were posted in an online survey hosted by Qualtrics (www.qualtrics.com) and presented individually accompanied by two 7-point scales and an age slider. Scale ends were labeled 1 (*very unattractive / very feminine*), 5 (*neutral*), 7 (*very attractive / very masculine*). Those faces that did not differ significantly from the neutral rating were used as the base-faces for morphing ($M_{face\ age} = 26.43, SD = 1.41$). They were symmetrized, cropped, and then morphed to look older, thus providing neutral faces manipulated to look both older and younger (See Figure 8).

Figure 8. Example of neutral young base-face morphed to look older.



Participants. Thirty-eight students from the VU University Amsterdam (10 male, 26 female; $M_{age} = 20.94$, $SD = 1.56$) participated in the experiment and received either money or course credit.

Materials and procedure. The participants in the experiment (separate from the pilot group) were led to individual cubicles where the experiment was conducted on a computer running Macromedia Authorware. Following a brief introductory screen, The participants were randomly assigned to a 2 (facial age: older versus younger faces) between-subjects by 2 (message: stability versus change messages) within-subjects design.

Participants in both conditions were then presented with a cover story explaining that they would be viewing the faces of potential leader candidates for an international organization with offices in the local region. They were told that each leader candidate had submitted a short statement describing their general views about organizational decisions, from which I removed all identifying information to protect anonymity except only a cropped photo of the leaders face. Participants were then asked to give their opinion about how well each individual's viewpoint matched their appearance, as well as how likely they would be to

follow that person given the combination of these factors.

Following these instructions, participants were shown 8 faces of potential group leaders. Underneath each face was one of 8 possible messages. Half of the statements expressed a desire for stability (e.g., "We should avoid taking risks and maximize the advantages that we already have"). The other half expressed a desire for change (e.g., "We should look for new and cutting-edge options for success"). As in Experiment 5.1, when a younger face was paired with a change statement, or an older face was paired with a stability statement, the combination was labeled "congruent." When a younger face was paired with a stability statement, or an older face was paired with a change statement, the combination was labeled "incongruent." To control for potential idiosyncratic effects of individual faces, the face-statement pairings were randomized across all participants so that no one face was paired consistently with either a congruent or incongruent statement.

Participants were then asked to rate how likely they would be to follow each face individually, using 7-point scales (1 = *very much no*, 2 = *very much yes*). Finally, demographic information was collected and participants were thanked and debriefed.

Results and Discussion

In order to verify that the facial morphing of age was effective, I conducted a one-way ANOVA using participants' ratings of the morphed faces as a manipulation check and found that the older faces were rated as significantly older ($M = 4.57$, $SD = .93$) than younger faces ($M = 3.66$, $SD = .67$; $F[1, 35] = 11.62$, $p < .01$). As in Experiment 5.1, the data was collapsed so that older faces paired with stability statements and younger faces paired with change statements were considered "congruent" while the converse were labeled "incongruent." In order to determine the effect of the congruent and incongruent conditions on participants' leadership ratings for each face, I conducted a repeated-measures analysis with the facial age

condition (young versus old) as a between-subjects factor and statement (change versus stability) as a within-subjects factor.

I found that overall, condition did not have a statistically significant effect on the leader rating ($F[1, 34] = .91, p = .30, \eta^2 = .026$), indicating that participants did not simply prefer younger or older faces overall. However, there was a significant effect of statement ($F[1,34] = 6.32, p = .02, \eta^2 = .157$), such that overall participants preferred the change statements ($M = 3.98, SD = .91$) over the stability statements ($M = 3.51, SD = 1.12$) which may reflect the relatively young average age of participants. As in Experiment 5.1, gender of participant had no effect ($F[1,34] = 0.27, p = .87, \eta^2 = .001$). Finally, as predicted, condition by statement was significant ($F[1,34] = 4.78, p = .036, \eta^2 = .127$) such that faces in the congruent conditions were perceived as more leader-like ($M = 3.96, SD = 1.04$) than those in the incongruent conditions ($M = 3.52, SD = .95$). Overall, findings from Experiment 5.2 further indicate that followers implicitly associated older leaders with stability initiatives and younger leaders for times of change even when the ability to make relative comparisons between old and young faces is inhibited.

Discussion

The results from two experiments support our biosocial hypothesis of age and implicit leadership prototypes. First, younger leadership is preferred when followers are looking for a leader in times of change and transition. Second, when followers are focused on the need for stability they look for leaders of older age. Together these results help to further bridge a surprising gap in the literature on cues of age and their relevance in leadership perceptions. The results also have a number of implications.

By establishing a biologically-based implicit association between age and leadership the findings also extend our understanding of the exploration-exploitation tradeoff.

Throughout hominin evolution we were nomadic, and this tradeoff had a physical component

which corresponds nicely with aging. Younger energetic leaders can *gain* status by exploring opportunities when they arise in changing environments and older experienced leaders can *maintain* status by exploiting established resources and social structures to provide stability – both provide important benefits to the group as well as individual opportunities for leadership (Spisak et al., 2011). Likewise, given the biological lag of evolution, my results suggest we still retain these prototypical biases. This helps to explain the connection between exploration, transformational leadership, and younger leaders versus exploitation, transactional leadership, and older leaders.

Another implication is in the realm of political leadership. As is true with masculine-war and feminine-peace prototypes (Spisak, Dekker, Krüger, & Van Vugt, 2012), it would benefit older candidates to emphasize the “value of stability” with voters, while younger leaders should attempt to make salient the “prosperity of change.”

At an organizational level my findings can help anticipate how group dynamics and followership behavior will shift with leadership age. For instance, followers may be more likely to buy into change and innovation initiatives when led by younger leaders. Conversely, when group goals are, to say, highlight and refine best practices, an older leader may elicit more buy-in.

This brings us to limitations and future work. First, this is only preliminary findings and further research is required. Second, continued investigation will benefit from a broader age range of participants. The narrow range of the current participants made it impossible to explore potential differences between younger and older followers. This can be easily accomplished by moving into more applied settings. Finally, future work may want to gather data on personality variables and transformational-transactional leadership items. This would provide a nice proximate level analysis that can be easily measured with current tools.

Overall, the current research provides evidence associating times of change with younger leadership and stability with older leadership, and age cues in the human face are utilized by followers to recognize these implicit contingencies. The work also adds to the literature on exploration and exploitation, has practical value for leaders, and encourages continued investigation. With increasing age in certain parts of the world, younger populations elsewhere, and the intensification of global connectivity, this topic will remain relevant and continually worthy of exploration.

