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## Short Communication

## In the eye of the beholder? An eye-tracking experiment on emergent leadership in team interactions

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## ABSTRACT

Integrating evolutionary signaling theory with a social attention approach, we argue that individuals possess a fast, automated mechanism for detecting leadership signals in fellow humans that is reflected in higher visual attention toward emergent leaders compared to non-leaders. To test this notion, we first videotaped meetings of project teams and collected leadership ratings for the team members from three rating sources. Second, we provided 18 naïve observers with 42 brief, muted video clips of the team meetings and analyzed their eye gazing patterns. Observers gazed at emergent leaders more often, and for an average longer duration, than at non-leaders. Gender effects occurred such that male emergent leaders received a higher number of fixations than female emergent leaders. Non-verbal behavior analysis indicated that emergent leaders showed a higher amount of active gestures and less passive facial expressions than non-leaders. We discuss theoretical and methodological directions for emergent leadership research in teams.

*“You can observe a lot by just watching.” (Yogi Berra)*

In all kinds of groups, human and nonhuman, leader and follower hierarchies are formed naturally because of their functionality for solving social coordination challenges (Bass, 1954; King, Johnson, & Van Vugt, 2009; Neubert & Taggar, 2004; Van Vugt, 2006; Winsborough, Kaiser, & Hogan, 2009). Hence, in initially leaderless groups, some individuals typically emerge as leaders; these individuals are perceived by others as taking over leadership responsibilities (Hogan, Curphy, & Hogan, 1994). Whereas research on emergent leadership has been heavily influenced by the “great person” perspective that investigates emergent leaders' traits and characteristics (Wellman, 2017), only a few studies focused on the role of those who pay attention to leadership signals. This is surprising, given that the competence to correctly infer who is the informal leader, or who it is worth following, is essential to become part of an effective group with higher survival chances than groups characterized by ineffective leadership (Spisak, Homan, Grabo, & Van Vugt, 2012).

An evolutionary signaling perspective on leadership suggests that individuals convey certain leadership signals which were markers of good leadership in ancestral environments and that observers should be able to immediately grasp these signals (Grabo, Spisak, & Van Vugt,

2017). Relatedly, an embodiment perspective on signaling assumes that these embodied signals flow directly from the emergent leaders or the immediate environment and do not necessarily involve verbal instructions (Reh, Van Quaquebeke, & Giessner, 2017). Indeed, research has shown that people ascribe leadership potential to others based on a range of static cues<sup>1</sup> such as physical height (Judge & Cable, 2004; Stulp, Abraham, Verhulst, & Pollet, 2013) or facial characteristics (Re et al., 2013; Rule & Ambady, 2008). Experimental evidence suggests that these signals may have evolved as accurate indicators of competence and power, which in turn should promote group effectiveness (Bellew & Todorov, 2007; Castelnovo, Popper, & Koren, 2017; Todorov, Mandisodza, Goren, & Hall, 2005).

However, in social situations static signals of competence and power may not directly translate to the ascription of leadership because leadership emergence is an outcome of dynamic interactions (Uhl-Bien, 2006; Uhl-Bien, Marion, & McKelvey, 2007). This means that individuals send various signals simultaneously, such as physical characteristics, nonverbal body language, or verbal cues, and observers are confronted with the challenge of inferring leadership from the variety of different competence signals. Initial evidence indicates that people can extract leadership cues (i.e., perceived charismatic behavior) from watching muted speech clips that show a person sending various

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<sup>1</sup> Not every cue is a signal; only when a cue has been selected by evolution because it increases the survival chances of senders (i.e., emergent leaders) and receivers (i.e., observers), it qualifies as a signal (Grabo et al., 2017; Henrich, 2009).

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leadership cues simultaneously, and that these perceptions predict leader prototypicality ratings (Tskhay, Zhu, & Rule, 2017). Yet, whereas such perceptual measures of leadership may capture a rather complex mental representation of leadership signals, we do not know whether leadership signals also trigger more automatic, rapid attention processes at a behavioral level. Given that early-stage cognition processes provide the building blocks of more complex, higher-order cognitive processes (Maner, DeWall, & Gailliot, 2008; Maner, Gailliot, & DeWall, 2007), an investigation of basic social attention mechanisms is important for a more comprehensive understanding of emergent leadership.

Functional social attention theory (Emery, 2000; Klein, Shepherd, & Platt, 2009) proposes that our sense systems such as social gaze have evolved to help individuals survive in social settings by immediately focusing on cues of relevance. Hence, a predisposed attention bias toward emergent leaders' signals in group interactions should be reflected in sensorial activities such as people's eye-gazing patterns. Integrating the social attention perspective with the assumptions of signaling theory, we thus assume that people's evolved "sense for seeing leadership" should manifest in an automatic tendency to gaze more often and for a longer duration at individuals who send out embodied leadership cues (and thus emerge as leaders) compared to non-leaders.

Our research offers several contributions to the literature. First, we add to theorizing about the origins of leadership as an ancient social coordination mechanism, predating the evolution of language in humans. Indeed, simple forms of leadership occur in a wide variety of species that signal leadership through nonverbal behaviors (Van Vugt, Hogan, & Kaiser, 2008). For example, the swimming patterns of fish, the flying patterns of migrating birds, and the movement patterns of non-human primates resemble leader-follower structures and reflect the two key ingredients of emergent leadership: someone is signaling the willingness to move the group (i.e., signaling theory) and someone is paying attention to these signals (i.e., functional social attention theory). Based on this phylogenetic evidence, we argue that individuals possess a fast, highly automated mechanism for detecting leadership potential in fellow humans.

Second, we use a triangulated approach involving three different raters to determine emergent leaders and then investigate naïve observers' actual behavior (namely their visual attention) when watching dynamic group situations in a natural project setting to shed light on the social attention bias toward emergent leaders. As such, we extend previous work that has relied on (1) observers' *perceptions* of emergent leadership from thin slices of behavior (e.g., Tskhay et al., 2017; Tskhay, Xu, & Rule, 2014), (2) *single* nonverbal cues of emergent leaders (e.g., physical height, Judge & Cable, 2004; Stulp et al., 2013), (3) *static* stimulus material (e.g., pictures, Re et al., 2013; Rule & Ambady, 2008) and (4) controlled *laboratory* settings (e.g., Cherulnik, Turns, & Wilderman, 1990; Re et al., 2013).

Third, we provide initial insights into the mechanisms through which emergent leaders may attract the social attention of naïve observers by exploring emergent leaders' and non-leaders' nonverbal behaviors from video clips. To do so, we adapt an established coding scheme (Bartel & Saavedra, 2000) that differentiates between active/approaching and passive/nervous postural cues and facial expressions to investigate nonverbal behavioral differences between emergent leaders and non-leaders. This design addresses some of the challenges inherent in survey-based research on emergent leadership such as halo effects that reflect an overall positive attitude toward a leader instead of actual behavior (Baumeister, Vohs, & Funder, 2007) or endogeneity problems (Antonakis, Bendahan, Jacquart, & Lalive, 2010).

## Theoretical background

### Attention to leadership cues

Actors in the "market of leader emergence" engage in purposeful

signaling strategies—"things one does that are visible and that are in part designed to communicate" (Spence, 2002, p. 434)—to focus others' cognitive resources on the most informative cues pertaining to leadership (Antonakis, Bastardo, Jacquart, & Shamir, 2016). Given that the social environment in which individuals interact is characterized by insufficient information, emergent leaders may use a range of verbal and nonverbal signals—and often make extensive use of both (Antonakis et al., 2016; Reh et al., 2017)—to indicate their ability for successfully coordinating groups in complex environments. Yet, whereas much research has investigated how people draw inferences about leadership from verbal tactics (e.g., Pavitt, Whitchurch, Siple, & Petersen, 1997; Tskhay et al., 2017), both evolutionary signaling theory and the embodiment signaling perspective of leadership provide conceptual reasons to assume that individuals also make intensive use of nonverbal social signals to draw inferences about whom to follow in groups.

First, from an evolutionary signaling perspective, selection favored individuals who possessed the ability to automatically and accurately recognize and attend to signals of leadership. Being able to draw immediate inferences about the leader in a group was helpful for solving urgent coordination challenges such as a resource crisis or an intragroup dispute (Boehm, 1999). Moreover, individuals with a comprehensive ability to evaluate the relative fitness of themselves and other group members from social signals also had an advantage in correctly determining their chances to compete for the high status role of a leader (i.e., is it worth trying to become the alpha now or wait a while?). Lastly, a higher sensibility for leader cues allowed group members to immediately monitor, learn from, and coordinate with individuals worthy of following (Henrich & Gil-White, 2001).

Second, an embodiment perspective on leadership suggests that abstract concepts such as leadership prototypes are stored modally in human brain structures (Reh et al., 2017). This means that the perception of embodied leadership signals—such as bodily gestures and postures, facial expressions, physical characteristics (Küpers, 2013)—may trigger bodily reactions of the observer (Reh et al., 2017; Schubert & Koole, 2009) such as directing his or her sense systems toward the source of the signals (i.e., the emergent leader). This is not to say that leader signals cannot also activate more complex cognitive evaluation patterns; yet, our reasoning here focuses on the habitual and automatic cognitive reactions that have evolved in the past because they increased people's survival chances. The communication abilities of this "early human mind" are likely to be limited to simple signs (Pentland, 2010), meaning that embodied signals may trigger short-term automatic reactions in observers. As the two-part model of the human brain (Kahneman, 2011) vividly describes, these unconscious processes complement humans' attentive and largely conscious mind.

In line with this two-system perspective of the human brain (Kahneman, 2011), evolutionary theory suggests that adaptive behavioral mechanisms exist at both levels of cognition (i.e., higher forms of reasoning and lower-level, automatic processes of attention). However, research so far has mostly focused on the more complex cognitive processes resulting in leadership perceptions (Maner et al., 2008). For instance, a laboratory study showed that naïve observers can draw inferences about emergent leadership both from verbal and nonverbal cues when watching 20-minute videotaped student group interactions (Stein, 1975). Yet, observers in this earlier work could rely on rather long time-frames with rich behavioral indicators for deriving assumptions about leadership through comprehensive cognitive information processing. In contrast, our research integrates evolutionary signaling theory, an embodiment perspective, and social attention theory to provide an explanation why observers should also be able to grasp leadership cues on a more basic, automatic attention level.

### Social attention theory

Humans evolved as group-living animals (Darwin, 1871), such that

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