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Childhood general cognitive ability predicts leadership role occupancy across life: Evidence from 17,000 cohort study participants

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ABSTRACT

Research in the leadership literature has not yet identified links between childhood general cognitive ability and leadership potential in adulthood. We tested whether early cognitive ability contributed to leadership role occupancy across four decades in a sample of 17,000 working individuals from two representative British cohorts. On average a 1 standard deviation increase in cognitive ability predicted a 6.2 percentage point higher probability of leadership role occupancy. In Study 1, adjusted models showed that 37.3% of high cognitive ability children (+1 SD) occupied leadership positions compared to 25.4% of low cognitive ability (−1 SD) children and this gap was even more pronounced in Study 2 (27.8% vs. 15.1%). Cognitive ability showed a graded association with the number of employees supervised in both studies and educational attainment partially explained the cognitive ability–leadership association. The results suggest that early individual differences in childhood general cognitive ability may profoundly shape trajectories of leadership across working life.

Introduction

Leadership roles are complex and require sophisticated information gathering and processing skills as well as strong planning and creative problem solving abilities. For these reasons key leadership models (e.g. DeRue, Nahrgang, Wellman, & Humphrey, 2011; Mumford, Campion, & Morgeson, 2007; Mumford, Zaccaro, Harding, Jacobs, & Fleishman, 2000) consider general cognitive ability to be a critical element underlying leadership competency. Employees also view intelligence as a prototypical attribute of leaders (Epitropaki & Martin, 2004; Lord, Foti, & De Vader, 1984). Yet, the evidence base for the association between general cognitive ability and leadership has relied primarily on findings from cross-sectional data (e.g. Judge, Colbert, & Ilies, , 2004; Mann, 1959) which have not been supported by recent longitudinal studies (Li, Arvey, & Song, 2011; Reichard et al., 2011). Given that high cognitive ability is considered to be a key element of leadership both in leadership models and by employees, the goal of this study is to test whether an association exists between early life general cognitive ability and leadership prospects across working life.

Although leadership development occurs continuously throughout the lifespan (e.g. Avolio, Walumbwa, & Weber, 2009; Day, 2011), we propose that the foundations of leadership may be laid early in life. Individual differences in general cognitive ability are formed primarily in the first decade of life, are highly stable, and prospectively predict a range of key life outcomes including criminal behavior, health, and success in finding and keeping work (e.g. Daly, Delaney, Egan, & Baumeister, 2015; Heckman, 2006; Heckman, Stixrud, & Urzua, 2006). There is also extensive evidence demonstrating that general cognitive ability predicts important facets of

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occupational success including job performance (Schmidt & Hunter, 2000), mobility in the job hierarchy and remuneration (Dreher & Bretz, 1991; Judge, Higgins, Thoresen, & Barrick, 1999; Salgado & Anderson, 2002; Schmidt & Hunter, 1998). However, research in the leadership literature has not yet linked childhood cognitive ability to leadership in adulthood, though there are strong theoretical reasons to suspect that intelligence may be an important precursor of leader emergence. The focus of this special issue is on leader cognition and we suggest that general cognitive abilities provide the cognitive architecture to support key types of thinking needed for leadership roles.

For instance, higher-level general cognitive abilities including verbal comprehension, working memory, reasoning and processing speed (Wechsler, 2008) may enable employees to generate valued solutions to problems within organizations (Mumford et al., 2000). When tackling difficult, ill-defined, or novel problems employees with higher levels of cognitive ability may be particularly effective in collecting and processing the quantitative and verbal information needed to identify a solution (Lau & Pavett, 1980; Mumford et al., 2007). Such individuals may be capable of holding several key pieces of information gathered from organizational systems in memory, mentally integrating this information, and reasoning through competing options to identify a workable solution. Finally, employees with strong cognitive abilities may work through this problem solving process quickly in the face of competing demands and time pressure. It is likely that such employees who are adept at solving crucial institutional problems may be particularly likely to be promoted to leadership roles.

In this study, we therefore suggest that leadership will tend to follow from general cognitive abilities. Specifically, we propose that early life general cognitive ability will play a formative role in shaping a key aspect of leadership — leadership role occupancy. We test whether childhood cognitive ability distinguishes leaders from other employees and identify the magnitude of this association using data from almost 17,000 participants from two large-scale prospective cohort studies from Great Britain. Both cohorts include high-quality measures of childhood general cognitive ability, other important predictors of occupational success such as socioeconomic status and self-control (Daly et al., 2015), and measures of leadership role occupancy at multiple time-points across adult working life.

General cognitive ability and leadership

Leadership and individual differences research saw a decline and subsequent resurgence during the 20th century. Stogdill's (1948) and Mann's (1959) reviews of the literature were viewed as providing little support for the idea that stable individual differences shape the emergence of leaders and leadership behaviors across contexts (Antonakis, Day, & Schyns, 2012). This led to the establishment of a behavioral perspective in leadership research focused on understanding leader behavior in many domains including task processes, relational dynamics, and change-orientated behaviors (DeRue et al., 2011).

Trait-based theories did not re-emerge as a focus of leadership research until the 1980s when reanalyses of prior studies found stronger evidence for cross-situational consistency in leadership emergence and perceptions than previously identified (e.g. Kenny & Zaccaro, 1983; Zaccaro, 2007). Lord, De Vader, and Alliger (1986) conducted a meta-analytic review of the studies examined initially by Mann (1959) and identified intelligence as a key characteristic that was positively correlated with perceptions of good leaders ($r = 0.50$). This research provided empirical support for a leader trait perspective and general cognitive ability as a potential determinant of leadership emergence and effectiveness.

As described above, there is a clear match between the comprehension, memory, processing, and reasoning skills that characterize general cognitive ability and the leadership skills needed to assimilate information and solve complex problems in modern organizations. Intelligence may also allow leaders to tackle other key cognitive job demands of contemporary organizations. For instance, high levels of cognitive ability may enable leaders to generate creative ideas and strategic plans in competitive and rapidly changing organizational environments (Mumford & Connelly, 1991; Mumford, Connelly, & Gaddis, 2003; Mumford et al., 2000). Creative leaders who advance original and useful ideas for the development of products, organizational processes, and employee skills are valuable to organizations particularly in uncertain economic times characterized by technological change (e.g. Reiter-Palmon & Illies, 2004). Although initial studies found little overlap between cognitive ability and creativity ($r = 0.17$; Kim, 2005), emerging evidence points to a potential strong contribution of general cognitive ability to several aspects of creative thinking. For instance, intelligence has been shown to positively predict divergent thinking ($r = 0.34$; Benedek, Jauk, Sommer, Arendasy, & Neunauer, 2014) and to facilitate the generation of creative metaphors ($\beta = 0.49$; Silvia & Beaty, 2012) and original ideas ($\beta = 0.51$; Benedek, Franz, Heene, & Neubauer, 2012). It is possible that creativity may act as a pathway between general cognitive ability and leadership. If employees with high levels of cognitive ability are more creative in their behavior and generate valuable solutions to organizational problems they may be considered to have strong leadership potential.

Employees with high levels of cognitive ability may also be considered suitable for leadership opportunities because of their ability to draw on information from multiple sources in order to generate plans and make strategic decisions. For instance, forming business strategies in order to achieve longer-term strategic objectives involves the accumulation, comprehension, and integration of an abundance of relevant information (Li et al., 2011). Such planning also involves the comparison of multiple alternatives and the anticipation of potential consequences which together pose substantial demands on cognitive abilities. Leaders must also make strategic decisions whilst dealing adaptively with complexity and information ambiguity within restrictions imposed by time, resources, system demands, and differing goals and conflicting problems (Mumford et al., 2000). Moreover, they must do this whilst monitoring numerous operations and employees which further taxes cognitive abilities. Thus, there are many theoretical reasons to expect those endowed with high levels of cognitive ability to be identified and selected as emergent leaders.

It is therefore potentially unsurprising that an empirical association between cognitive ability and leadership has been comprehensively documented in the literature (Judge et al., 2004; Kickul & Neuman, 2000; Lord et al., 1986; Mumford et al.,