

Technical Report 1399

**Guiding the Way: A Review and Annotated Bibliography of
Leader and Leadership Development**

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August 2021

**United States Army Research Institute
for the Behavioral and Social Sciences**

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Washington Metropolitan Area

Technical Review by

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REPORT DOCUMENTATION PAGE			<i>Form Approved</i> <i>OMB No. 0704-0188</i>		
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1. REPORT DATE (DD-MM-YYYY) August 2021		2. REPORT TYPE Final		3. DATES COVERED (From - To) January 2020 – April 2021	
4. TITLE AND SUBTITLE Guiding the Way: A Review and Annotated Bibliography of Leader and Leadership Development			5a. CONTRACT NUMBER W911NF-16-2-0092		
			5b. GRANT NUMBER		
			5c. PROGRAM ELEMENT NUMBER 622785		
6. AUTHOR(S) Woody, Brendon, A. Elliott, Samantha, N.			5d. PROJECT NUMBER A790		
			5e. TASK NUMBER		
			5f. WORK UNIT NUMBER		
7. PERFORMING ORGANIZATION NAME(S) AND ADDRESS(ES) Consortium of Universities of the Washington Metropolitan Area 4214 King Street Alexandria, VA 22302-1555			8. PERFORMING ORGANIZATION REPORT NUMBER		
9. SPONSORING / MONITORING AGENCY NAME(S) AND ADDRESS(ES) U. S. Army Research Institute for the Behavioral & Social Sciences 6000 6 th Street (Building 1464/Mail Stop 5610) Fort Belvoir, VA 22060-5610			10. SPONSOR/MONITOR'S ACRONYM(S) ARI		
			11. SPONSOR/MONITOR'S REPORT NUMBER(S) Technical Report 1399		
12. DISTRIBUTION / AVAILABILITY STATEMENT Approved for public release: distribution unlimited.					
13. SUPPLEMENTARY NOTES ARI Research POC: Dr. Mathias J. Simmons, Fort Leavenworth Research Unit, (913) 702-5269					
14. ABSTRACT Leadership and individual leader development is an important topic for many organizations, and is especially relevant to the United States Army. As the Army turns its focus to the future operations landscape, a better understanding of the factors influencing leader development is required. This paper covers four themes in leadership and leader development research: (a) conceptual concerns in the literature, (b) the importance of study design in development research, (c) expanding the developmental criteria, and (d) how experiences and individual factors play a role in the developmental process. The purpose of this paper and annotated bibliography is to help inform current and future research on leadership and individual leader development, all of which will inform future leader assessment and training methods.					
15. SUBJECT TERMS Leadership; Motivation; Personnel Development					
16. SECURITY CLASSIFICATION OF:			17. LIMITATION OF ABSTRACT Unlimited Unclassified	18. NUMBER OF PAGES 116	19a. NAME OF RESPONSIBLE PERSON Kingsley C. Ejiogu
a. REPORT Unclassified	b. ABSTRACT Unclassified	c. THIS PAGE Unclassified			19b. TELEPHONE NUMBER (include area code) (913) 702- 5318

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Acknowledgement

We would like to thank Mathias Simmons and Melinda Key-Roberts for their input through the process of compiling these resources. We would also like to thank the rest of my colleagues at the Fort Leavenworth Research Unit of the U.S. Army Research Institute for their camaraderie and support.

GUIDING THE WAY: A REVIEW AND ANNOTATED BIBLIOGRAPHY OF LEADER AND LEADERSHIP DEVELOPMENT

EXECUTIVE SUMMARY

Research Requirement:

The U.S. Army Research Institute for the Behavioral and Social Sciences (ARI) is pursuing a program of research centering on the assessment and development of leader competencies specifically with regard to the future operational environment. This paper was written to identify themes in the leadership and individual leader development research literature to better inform the program of research.

Procedure:

To accomplish the goal of informing the research program regarding the assessment and development of leader competencies, we conducted an in-depth literature review, which resulted in a final list of annotated articles across 58 references. In addition to the annotated references, we also organized our relevant sources into a synthesis of our literature review.

Findings:

Through the process of reviewing and annotating the articles, we identified and used four concept areas to organize the literature review and annotated articles: (a) *Conceptualizing Development*, (b) *Alternative Research Approaches*, (c) *Building the Development Criteria*, and (d) *Developmental Experiences, Individual Readiness, and Leader Identity*.

Concept Area 1: *Conceptualizing Development* first highlights the differences between what is meant by the terms *leadership development* and *leader development*. Leadership development implies that development occurs at a more collective or group level. Leader development solely focuses on the development of an individual. We further expanded these ideas in the discussion of collective levels and perspectives that are under consideration in conceptualizations of leadership development (e.g., peers, subordinates). Finally, some references are discussed that incorporate a lifespan perspective in the conceptualization of leadership development and leader development.

Concept Area 2: *Alternative Research Approaches*. This area primarily focuses on methodological challenges in leader development research, as well as alternative research approaches for addressing these challenges. Specifically, there is a focus on longitudinal and quasi-experimental research designs. Another methodology discussed in this section is social network analysis. These references introduce the methodology and its relevance to leadership development, but also highlight the challenges in conducting such research.

Concept Area 3: *Building the Development Criteria*. This area outlines the importance of expanding the criteria in development research beyond emergence and effectiveness, and of using more specific models of leader skills and competencies. Additionally, references that outline the assessment of leader competencies are discussed.

Concept Area 4: *Developmental Experiences, Individual Readiness, and Leader Identity*. This area outlines the important factors in leader development as discussed in the literature. The different conceptualizations of experience as a factor in development are outlined, in addition to a breakdown of components of developmental experiences. In conjunction with experiences, which represent a key role in the developmental process, a variety of individual characteristics, such as individual readiness and leader identity, have been recognized for their role in a more advantageous developmental trajectory.

Utilization and Dissemination of Findings:

This report serves as a summary of the research literature on leadership and leader development. The report is intended as a resource to inform current and future Army research concerned with the assessment of Army leaders, and methods used to further their development. Though this research review was undertaken with the Army in mind, audiences external to the military context may find this report to be a useful resource on leadership and leader development.

GUIDING THE WAY: A REVIEW AND ANNOTATED BIBLIOGRAPHY OF LEADER AND LEADERSHIP DEVELOPMENT

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Guiding the Way: A Review and Annotated Bibliography of Leader and Leadership Development

In today's global and fast-paced world, having the best talent available is critical for organizational success. Industries and the nature of work are constantly evolving. Therefore, the knowledges, skills, and abilities of the workforce must also be constantly evolving. This persistent need for more qualified, experienced individuals highlights the gap between workforce supply and demand. Unfortunately, the available pool of experienced, talented individuals is inherently limited. Thus, if the pool of talent does not meet the needs of the organization, then the organization must leverage its available talent through training and development. Indeed, survey findings indicate that 86% of leaders reported development as an "important" or "urgent" need within their organizations (Schwartz et al., 2014).

The talent gap discussed above not only occurs in civilian organizations, but also in entities such as the U.S. Army. The nature of war is becoming increasingly more unpredictable and dynamic (Department of the Army, 2017) and the operational environment in which the Army works under is complex, chaotic, and hypercompetitive (Department of the Army, 2016). Consequently, talent needs are ever changing and continually evolving. Finding Army personnel who currently possess the necessary skills and competencies to successfully navigate the chaotic and complex nature of war is a difficult challenge. Therefore, the Army places great emphasis on developing competent leaders and equipping them with the knowledge and skills necessary for effective performance, both now and in the future operating environment (Department of the Army, 2019). More specifically, the Army depends on itself to develop leaders, noting the importance of robust and holistic development programs (Department of the Army, 2015).

Unfortunately, research has lagged behind need in the leader development and leadership development domain. The study of leader development is a relatively new field, emerging mostly during the 21st century (Day & Dragoni, 2015; Day et al., 2014). Leader development research has suffered from a lack of clear direction, with researchers approaching construct definitions, theoretical orientations, and measurement considerations in haphazard ways (Day & Dragoni, 2015). Adding to this issue, the study of leader development is markedly different from typical leadership research (Day et al., 2014). For example, there is a long-established pattern of linking innate characteristics (e.g., personality, intelligence) with leadership (Day et al. 2014), which greatly limits developmental research.

The Army has not been immune to these aforementioned research issues. In fact, it was long held that successful leadership in the Army was based on intelligence and other solely hereditary attributes (Vinchur & Koppes, 2011). Consequently, standardized intelligence tests (i.e., Army Alpha and Army Beta) were used to help the Army select and assign recruits to different job assignments. All told, nearly two million soldiers were tested at a cost of 50 cents per soldier (Ferguson, 1962-1965). Not only did this reinforce racial and ethnic stereotypes that would continue to persist well beyond the early 20th century, but the field was blind for decades to the influence of situations and the environment as well as to the possibility that Army personnel could be developed beyond what the results of an intelligence test said about them. Since this time, strides have been made with respect to applied psychological research within the

Army. However, much is yet to be learned regarding how best to develop U.S. Army personnel to be leaders that will address whatever the future holds.

What follows in this review is a synthesis of the literature on leader development and leadership development, and the frameworks that have primarily emerged in research on this topic in the current century. Additionally, in examining work in the field of leader and leadership development, future research directions will be discussed.

Method

The primary interest for this annotated bibliography was to understand current trends, research challenges, and frameworks involved in the study of leader development. Additionally, the aim of the bibliography was to synthesize that research into a meaningful framework that can be used to guide future leader and leadership development efforts. In order to achieve this goal, a literature review was conducted focusing on review articles and empirical research related to leader development. The primary resources used to find publications relevant to the area of interest were Google Scholar, PsycINFO, and ABI/INFORM Collection. The following search terms were primarily used to conduct the literature search: leader development, leadership development, developmental trajectory, leader growth, leader competency development. The publications in this annotated bibliography came from several of the top applied psychology and management journals (e.g., *The Leadership Quarterly*, *Journal of Applied Psychology*, *Personnel Psychology*) with the goal of identifying trends, research challenges, and key areas for future research.

Through the process of searching, reading, and summarizing publications, themes were developed in order to characterize major points in the literature. The themes that were derived were: (a) *Conceptualizing Development* (b) *Alternative Research Approaches*, (c) *Building the Development Criteria*, and (d) *Developmental Experiences, Individual Readiness, and Leader Identity*.

Literature Review Synthesis

Conceptualizing Development

Before turning to specific and nuanced topics regarding leader development and leadership development, it is critical to first discuss more foundational matters. For the purpose of both research and practice, it is important to clearly define what is meant when discussing leadership development and leader development. Moreover, perhaps the most important issue to consider when conceptualizing development is who will be the focus of developmental efforts. Typically, the focus is on the development of individual leaders, but increasingly the development literature has expanded this to include the groups or teams that individuals work with in context. Furthermore, popular leadership theories are another common criterion for leader development initiatives. In order for organizations to develop leaders, we first have to decide on what good leadership looks like, however, the proliferation of leadership theories combined with the boundary conditions of these theories being ill-defined leads to issues of

generalizability. The final issue to consider is that of time. The terms leadership development and leader development imply some sort of change over time, so it is important that research and practice find the optimal time frame for capturing change. Therefore, it is important to be mindful that any study or intervention of a developmental process is only observing a brief window of development for any individual. With the aforementioned points in mind, the following Conceptualizing Development section will outline these foundational issues within this research domain and shed light on possible directions for future research.

Leader and Leadership Development

An initial and necessary discussion regarding the developmental literature surrounds the definitions of *leader development* versus *leadership development*. The term leadership development is often assumed to mean the development of individuals in leadership roles (Day & Thornton, 2018, Annotated Bibliography [AB] #7). However, leadership by definition is not simply an individual operating within a role, but rather a process of influence between two or more people oriented towards accomplishing a mutual goal (DeRue & Myers, 2014, AB #5; Day & Thornton, 2018, AB #7). This requires distinction between the terms leader development and leadership development. Leader development focuses on an individual's growth in their ability to operate effectively as a leader, whereas leadership development refers to an organization's capacity to improve leadership processes necessary to accomplish collective goals (Day, 2000; Day et al., 2014, AB #4; Day & Thornton, 2018, AB #7). What is often referred to in research and practice as leadership development, is more aptly called leader development, as intact leader-follower dyads or work groups are not often the focus of the study or intervention (Day & Thornton, 2018, AB #7).

Organizations should be, and typically are, interested in both leader development and leadership development, as each conceptualization by itself is inadequate in understanding how an organization's leadership capacity is developed (DeRue & Myers, 2014, AB #5). More recently, researchers attempting to provide more clarity to the issue have used the term *leader/ship development* to refer to the growth of both individual and collective capacities for leadership tasks and processes (Day & Thornton, 2018, AB #7). Additionally, organizations and researchers alike have begun emphasizing more collective models of leadership, moving the focus away from a position within an organization towards anyone who engages in behaviors indicative of leadership, such as providing direction and building commitment (DeRue & Myers, 2014, AB #5; Day & Thornton, 2018, AB #7). However, comprehensive theory that captures both leader development and leadership development is incomplete.

For a brief integrative review of both leader and leadership development literature, Day and Dragoni (2015, AB #6) summarized each area and highlighted future research needs. In this review, a model is presented that highlights individual self-views (e.g., leadership self-efficacy, leader identity) and competencies as proximal indicators of development and more complex skills and meaning-making structures as distal outcomes. Further articulation of what constitutes distal individual development outcomes are explained through dynamic skill theory and constructive-development or ego development theory. At the collective or group level, the

development of psychological safety and shared mindsets represent proximal indicators of group development, whereas collective leadership capacity is a distal outcome. The primary theory discussed with respect to leadership development was leader-member exchange theory, which emphasizes the relational aspect of leadership between a leader and follower.

Ultimately, organizations require methods and practices that promote both leader development and leadership development simultaneously. These methods and practices for promoting both leader development and leadership development are typically done through the initiation of structured programs, emphasis on development through experience, and implementing organizational strategies with a developmental focus (Day & Thornton, 2018, AB #7). However, each approach comes with its own challenges. Structured development programs are frequently used with a wide variety of topics and formats. Yet, these programs may often result in episodic thinking or an assumption that development is intended to occur only during the beginning and end of a structured program. Developmental experiences are believed to be the primary catalysts of growth for leaders (McCall, 2010). Unfortunately, the content and quality of developmental experiences can be difficult to operationalize in research and evaluation. Finally, organizations can seek to embed their developmental practices within their culture under the Deliberately Developmental Organization (DDO) concept (Kegan & Lahey, 2016). This approach emphasizes building trust and mutual respect amongst coworkers, helping individuals recognize how interconnected leadership development is, and providing regular practice sessions embedded during daily work.

In sum, it is critical to consider the conceptual differences between leader development and leadership development. Organizations would be well served by trying to integrate methods and practices that promote both leader development and leadership development simultaneously. Unfortunately, comprehensive theories within this domain are still lacking. Consequently, leader development and leadership development programs within organizations need more scientific and methodological rigor in order to assess effectiveness and fully understand the phenomena at hand.

Conceptual Issues in Leadership Theories

Given the importance assigned to leadership by practitioners and academics, there is no shortage of consultants, researchers, and the like offering solutions to organizational leadership problems. This emphasis has spawned a multitude of new and exciting leadership theories, with proponents who claim not only that their leadership model or theory is unique, but also that leaders who align their behavior in accordance with it will experience a wide range of positive outcomes. Examples include transformational, authentic, and servant models of leadership, each model claiming a unique leadership formula for success (Alvesson & Einola, 2019, AB #26). However, each model is ideologically and practically flawed (Alvesson & Einola, 2019, AB #26). Given this proliferation of leadership theories and constructs, the literature lacks theoretical integration (Avolio, 2007). Moreover, given the number of leadership theories in existence, the literature suffers from being overly complex. This complexity impacts researchers' and practitioners' ability to build theory and developmental practice (Hughes et al., 2018). Perhaps

the best illustration of the flaws in newer leadership models is authentic leadership (Alvesson & Einola, 2019, AB #26).

There are a variety of definitions of authentic leadership (Gardner et al., 2011). Most definitions describe authentic leaders as having a heightened sense of self-knowledge and whose behaviors are aligned with their sense of self (George, 2003; Ilies et al., 2005; Shamir & Eilam, 2005). Other definitions include an aspect of being knowledgeable or sensitive to the perspective of others in the leader's work environment (Begley, 2004). Moreover, other authentic leadership definitions include a moral and ethical component (Whitehead, 2009). According to Alvesson and Einola (2019, AB #26), the issues with authentic leadership theory begin with the conceptualization. Being authentic to oneself inherently requires an intense and intentional focus on the self, whereas the role of a leader is primarily about influencing others (Alvesson & Einola, 2019, AB #26).

There also remains a question of the degree to which authenticity is a desired practice in organizational settings. There are a number of reasons why authentic leadership may not be as desirable as the literature suggests. For example, authentically undesirable behaviors (e.g., bad temper, intolerance, narcissism, poor social skills) may become reinforced. Additionally, leaders subscribing to the authentic leadership model may become inflexible and intolerant of other viewpoints. Moreover, being authentic implies being vulnerable to others. Finally, authenticity may not be rewarded for minority or historically disadvantaged groups (Alvesson & Einola, 2019, AB #26). Many of the issues with authentic leadership can also be applied to other new models of leadership, such as servant and transformational leadership (Alvesson & Einola, 2019, AB #26).

Ultimately, authentic leadership is just an example of how the boundary conditions of popular leadership theories are often vague. In addition to the proliferation of these popular leadership theories, there seems to be considerable conceptual overlap. These factors limit the degree of insight that can be gained in leader or leadership development initiatives. Indeed, these newer leadership theories have highlighted the importance of such attributes as leader vision, transparency, charisma, and ethics, all of which represent variables that were previously neglected. The attention to these attributes in the newer leadership theories makes it unlikely that the variables will be abandoned (Hannah et al., 2008). However, the leadership literature would benefit from a focus on how leaders balance their ideals and responsibilities, leader-follower relations, and the boundary conditions of specific leadership theories (e.g., advantages and disadvantages of authenticity in the workplace). The leadership literature as a whole would be better served by a more integrative focus of not just the leaders, but the followers and the situational context within which leadership is occurring (Day & Thornton, 2018, AB #7). Only when these leadership theories can be operationalized, conceptualized, and integrated in a parsimonious manner can they be utilized to their fullest potential by researchers and practitioners. In other words, it is difficult, perhaps impossible, to use popular leadership theories as a guide for leader development and leadership development programs when the constructs are ill-defined, overlapping, or otherwise built on shaky theoretical and empirical grounds. With conceptual and theoretical clarity comes the ability to measure and evaluate programs within a

given context, therefore providing better causal evidence of the efficacy of leader development and leadership development initiatives.

Leader Development Throughout the Lifespan

Leader development and leadership development involve changes over time, so it is critical to find the optimal time frames for capturing the changes. Although our understanding of leader development is primarily through a focus on developmental experiences that occur well into adulthood, one major limitation is the lack of knowledge of development that occurs in childhood and adolescence (Murphy & Johnson, 2011, AB #3). It is important to understand leader development in childhood or adolescence because the development of some leadership skills is likely more malleable at a younger age. Moreover, leader development is self-reinforcing by nature, in that as one gains confidence in their ability they become more likely to engage in leadership experiences, which subsequently reinforces their confidence as it relates to leadership (Hannah et al., 2008; Murphy & Johnson, 2011, AB #3). Aside from the difficulty in conducting longitudinal research and research with minors, another reason for the lack of research in this domain is an insufficient number of concrete theoretical models of youth leader development (Alomair, 2016; Murphy & Johnson, 2011, AB #3). Unfortunately, leadership theories and models are geared towards the adult experience (Karagianni & Montgomery, 2018) and often neglect childhood experiences. For example, path-goal theory, transformational or transactional leadership, and contingency leadership theories all do not adequately account for leader development in children (Karagianni & Montgomery, 2018).

However, despite this general lack of research, some scholars have made efforts to investigate leadership in youth. One such model that incorporates childhood and adolescent experiences was proposed by Murphy and Johnson (2011, AB #3). This model outlines some of the possible early influences of leader development. The first set of factors include the role of genetics and temperament. Although genetics do play a meaningful role in leader emergence and leader effectiveness, heritability only explains between 24% and 30% of the variability in leader role occupancy (Arvey et al., 2006; Arvey et al., 2007; De Neve et al., 2013). The next set of factors include parenting styles and attachment styles. For example, individuals that report a more secure attachment style during their childhood also report engaging in transformational leadership behaviors more frequently (Mack et al., 2011; Popper, 2011). Finally, the last set of factors involve the opportunities a child has to develop leadership amongst their peers in organized sports and at school. For instance, in a small sample of West Point cadets, involvement in athletics and other extracurricular activities during high school was related to leader development as a cadet (Bartone et al., 2007). These influential factors are all proposed to impact an individual's identity as a leader, their ability to self-regulate around leadership goals, and their subsequent engagement and effectiveness in leadership opportunities.

Given the methodological challenges of studying how factors in childhood and adolescence influence leadership in adulthood, there has been limited empirical research investigating this phenomenon. One exception is research done as part of the Fullerton Longitudinal Study (FLS), a research initiative that has provided some of the best evidence that

experiences in childhood are related to leadership outcomes in adulthood. The FLS is an ongoing longitudinal research project that was designed to study participants from childhood (age 2 years) through adolescence and on into adulthood. FLS began in 1979 with 130 participants, with yearly assessments through age 17 years, and subsequent assessments of the participants at ages 24 and 29 years. The leadership assessments were gathered at age 29 years. Many topics were covered as a part of this study, including leadership development, and a series of studies were published in a special issue of the *Leadership Quarterly* (Riggio & Mumford, 2011). Each study from the special issue was briefly discussed and synthesized by Day (2011, AB #2), but several of the articles are also annotated in this bibliography.

Among the findings from the FLS, Extraversion measured at age 17 years was related to leadership duties and self-rated transformational leadership reported at age 29 years, whereas verbal IQ was related to work-related leadership duties and nonwork leadership positions, but not to transformational leadership (Reichard et al., 2011, AB #18). Children who exhibited an approach temperament were more extraverted in adolescence and reported more work-related leadership responsibilities and, in adulthood rated themselves higher with respect to transformational leadership (Guerin et al., 2011, AB #13). Intrinsic motivation in childhood was related to motivation to lead in adolescence (Gottfried et al., 2011, AB #12). Specifically, intrinsic motivation in childhood predicted adolescent motivations of affective-identity (liking to lead) and noncalculative (leading even without personal benefit), but no relationship was found with social-normative motives (feeling a duty to lead). Finally, a stable family environment in adolescence (measured at ages 12, 14, 16, & 17 years) was indirectly related with self-rated transformational leadership in adulthood, through a more positive self-concept (Oliver et al., 2011, AB #17). These studies represent some of the strongest evidence that individual dispositions and environments measured in childhood and adolescence exhibit meaningful relationships with leadership outcomes in adulthood.

In more recent research, the relationship between overparenting and leader emergence has been found. Overparenting represents high levels of parental protection and responsiveness to children (Locke et al., 2012). In one study, overparenting was studied in a Chinese sample of junior high students with ratings from parents, teachers, and peers (Liu et al., 2019, AB #8). Overparenting was found to be negatively related to ratings of leader emergence from each rating source and to leader role occupancy. These effects were mediated by self-esteem and leader self-efficacy. Most interestingly, the findings related to sex differences as male students received more overparenting and exhibited less leader emergence than their female peers. Additionally, the mediated effect of overparenting on leader role occupancy (via self-esteem and leader self-efficacy) was significant for females but not males, indicating that leader emergence for female adolescents was a larger function of their own self-views.

Clearly, there is strong initial evidence that childhood and adolescence play a role in leadership development for adults. Therefore, further research should investigate the mechanisms by which learned knowledge or life experiences prior to adulthood can influence leadership and leader development. Although the ideal study design for such research would be longitudinal, cross-sectional and retrospective designs are also useful, particularly for examining how early

life experiences are related to adult leadership (Murphy & Johnson, 2011, AB #3). Practically, this research helps organizations to understand the importance of early childhood and adolescent experiences and their relationship to leadership and leadership skills in adulthood. In a military setting, the relationship between childhood/adolescent experiences and leadership is important for a couple reasons. First, if early life experiences impact leadership ability in adulthood, then biographical data measures (i.e., scales measuring past experience, background, and behavior; Hough, 2010) can be used for the recruitment, selection, and placement of individuals best suited for certain types of leadership positions. Second, military organizations, for example the Army, can provide young Soldiers with experiences that are shown to benefit leadership later in life.

Alternative Research Approaches

Now that the critical considerations regarding leader development and leadership development conceptualizations have been discussed, we turn our attention to methodological issues and alternative research approaches present within the literature. The study of leader development and leadership development inherently involves methodological challenges. For example, leader development and leadership development involve multiple levels for potential study, such as within- and between-person effects, dyadic or matched pairs of individuals, and the effects of teams and organizations (Day & Thornton, 2018, AB #7). Although leader development and leadership development research is complex and presents obstacles, it also presents opportunities for future research to address. Various alternative research methodologies exist that can help mitigate challenges present in more common methods (e.g., survey data and cross-sectional research). For example, studies with multiple observations of the same individuals over time allow for the examination of within-person and between-person effects. Longitudinal designs are better able to address the factor of time in leader development and leadership development and the study of developmental trajectories (Day et al., 2009a, AB #1). Furthermore, leader development and leadership development research is greatly strengthened by quasi-experimental research design allowing for stronger conclusions with respect to causality (Avolio et al., 2009, AB #9). Moreover, leadership is an inherently social phenomenon and social network methodology is a promising methodology for understanding the complex social networks of leaders and the collectives they belong to (Carter et al., 2015, AB #23). Although no research design is free from challenges or drawbacks, findings from studies utilizing the alternative research approaches mentioned above provide valuable insight into the complexity of leader development and leadership development. Therefore, the following section outlines information bearing on the use of these alternative research approaches in the leader development and leadership development literature.

Longitudinal Research Design

Leader development and leadership development is primarily concerned with change. When development is the focus of a study, a longitudinal research design is the most appropriate methodology (Day et al., 2009a, AB #1). Longitudinal research is a costly and difficult endeavor. Nevertheless, longitudinal research is a necessity in answering important questions related to change over time (Day, 2011, AB #2). Longitudinal research is conducted for many reasons: (a)

identifying and describing intraindividual change, (b) identifying and describing individual differences in intraindividual change, (c) identifying interrelationships among variables over time, (d) analyzing the causes of intraindividual change, and (e) analyzing the causes of individual differences in intraindividual change (Baltes & Nesselroade, 1979). Cross-sectional survey research is simply unable to answer any of these questions.

Although research designs with more than two waves of data collection are better than cross-sectional designs, they are not considered to be truly longitudinal (Day, 2011, AB #2). Longitudinal research can be defined as “emphasizing the study of change and containing at minimum three repeated observations (although more than three is better) on at least one of the substantive constructs of interest” (Ployhart & Vandenberg, 2010, p. 97). The methodological features that define longitudinal research and studies of change include: (a) at least three waves of data, (b) an outcome that changes systematically over time, and (c) a sensible metric for tracking time such as days, months or years (Singer & Willett, 2003). Designs with two waves of data collection may be better than cross-sectional data but are more restrictive with respect to assumptions and only allow the modeling of linear change (Singer & Willett, 2003).

Although two-wave research designs or quasi-longitudinal studies provide valuable contributions to the literature on leader development and leadership development, these designs are still limited in the inferences that can be made from them (Day, 2011, AB #2). For example, the Management Progress Study of leader development and leadership development at AT&T that began in 1956 (Bray et al., 1974), is one of the best-known early studies in the leader development literature. However, data was only consistently collected in the first two assessment periods and some measures were changed or dropped by the third assessment period. Despite the quasi-longitudinal nature of this study, valuable insights and conclusions that were gleaned from the data paved the way for future leader development and leadership development studies. Another influential set of leadership studies that consisted of two waves of data were published as a part of the Fullerton Longitudinal Study (FLS) and were previously discussed in this literature review (Gottfried et al., 2011, AB #12; Guerin et al., 2011, AB #13; Oliver et al., 2011, AB #17; Reichard et al., 2011, AB #18). The FLS as a whole had a longitudinal design, but the leader development portions only included two waves of data.

The Management Progress Study and the FLS were solely focused on individual leader development, whereas other studies with two waves of data collection have been able to incorporate peer perspectives on emerging leaders (Kalish & Luria, 2016, AB #22). Peer and subordinate perceptions are critical to consider because such perceptions may impact both the emergence of leadership and the development of leadership over time. Kalish and Luria (2016, AB #22) studied a group of high school graduates in a military boot camp over the course of two days. Kalish and Luria were interested in whether the attributes that peers used to assess emerging leaders would shift from more observable attributes (i.e., physical ability), which are immediately apparent, to attributes that were more covert and tended to emerge over time (i.e., cognitive ability). During the first day of the boot camp, participants with higher levels of physical ability were more likely to be perceived as leaders by their leaders. On the other hand, participants with higher levels of cognitive ability were more likely to be perceived as leaders at

the end of the boot camp. Additionally, participants with high levels of physical ability were more likely to perceive other similarly physically abled participants as leaders at both time points, whereas participants with higher cognitive ability perceived similar participants as leaders only at the end of the camp. These findings indicate a similarity bias in leader perceptions. However, these findings do speak to how this similarity bias shifts over longer periods of time, nor do the findings highlight how biased leader perceptions impact the emergence and development of leaders. These gaps represent a promising avenue for longitudinal leader development and leadership development research. More generally, the findings from this study demonstrate that peer perceptions of the skills and abilities of emerging leaders change over time and the factors peers use to judge leadership shift over time as well. On a basic level, these findings highlight the critical need for more longitudinal research to investigate this phenomenon over longer periods of time, as the Kalish and Luria (2016, AB #22) study was only quasi-longitudinal with two time points over the course of two days. More specifically, the findings underscore the need to investigate the mechanisms by which shifting peer or subordinate perceptions impact leader development over time. It may be that social or developmental interventions can be put in place to mitigate negative effects and/or enhance positive effects stemming from these perceptions.

The previously discussed special issue of *The Leadership Quarterly* (Riggio & Mumford, 2011), which contained articles detailing the FLS, also contained articles that met the criteria for being considered as a longitudinal study with three or more waves of data collection (Li et al., 2011, AB #16; Harms et al., 2011, AB #14; Day & Sin, 2011, AB #11). Li and colleagues studied the influence of intelligence, self-esteem, and family socioeconomic status on leader emergence using data from the National Longitudinal Survey of Youth 1979 (U.S. Department of Labor). Self-esteem was found to have a significant and positive effect on leader role occupancy for men and women and leadership advancement (operationalized as number of employees supervised) for women. Consistent with other research in the same special issue, general mental ability was unrelated to developmental trajectories of either leader role occupancy or advancement (Gottfried et al., 2011, AB #12). Another interesting finding was that family socioeconomic status was negatively related to the leadership advancement for women.

In yet another study published in the special issue of *The Leadership Quarterly* (Riggio & Mumford, 2011), Harms et al. (2011, AB #14) analyzed the developmental trajectories of leadership ratings of West Point cadets in relation to subclinical personality traits. Over the course of three years at West Point, ratings of the 12 sub-facets of cadet's Periodic Developmental Review (PDR) were tracked. PDRs represent an evaluation instrument filled out by each cadet's immediate supervisor(s). The 12 sub facets of the PDR have been confirmed by factor analysis and include categories such as *Communication Skill*, *Response to Feedback*, and *Interpersonal Fairness*, among others. Each of the PDR facets showed increases over time, with the subclinical traits explaining 11%-17% of the variance in the PDR dimensions. As hypothesized, the *Skeptical* and *Imaginative* traits were negatively related to leader development. However, the *Cautious*, *Bold*, *Colorful*, and *Dutiful* traits were positively related with development over time across multiple facets.

The final longitudinal study in the special issue examined the developmental trajectory of leader effectiveness ratings in relation to leader identity, goal orientation, and adult development processes (Day & Sin, 2011, AB #11). Undergraduates in a 13-week leadership and team building course, were rated by their team adviser on their leader effectiveness on four occasions. There was a significant negative linear trend in leader effectiveness ratings, but also a positive quadratic trend, indicating a slight increase in leader effectiveness at the end of the course. Leader identity was positively related with effectiveness over time. Learning-goal-orientation was related to higher initial effectiveness and to the quadratic trend, therefore indicating that a learning-goal-orientation was more adaptive. Avoidance-goal-orientation was negatively related to initial effectiveness. However, contrary to predictions, participants who were lower in avoidance-goal-orientation had a steeper decline in effectiveness over time. Lastly, the data was analyzed in order to find unobserved subpopulations, or classes. In other words, although category membership was unknown to the group members, category membership was inferred through data analysis. In the overall sample, two latent trajectories were identified: the larger and dominant class (N= 1118) had an overall negative trajectory with stabilization at the second and third time points. Conversely the smaller, nondominant class (N=131) had a positive linear developmental trajectory. It was found that individuals that were more selective in the goals they were setting were more likely to be in the nondominant positive linear trajectory group.

The longitudinal studies outlined above made critical contributions to leadership development research. Li et al. (2011, AB #16) found that general mental ability was unrelated to developmental trajectories of leader emergence over time. These findings extend previous research from Gottfried et al. (2011, AB #12), who found that childhood/adolescent intelligence did not predict motivation to lead in adulthood. In other words, intelligence, or general mental ability, as measured throughout the lifespan does not predict leader emergence or development in adulthood. However, all three of the truly longitudinal studies summarized highlight the relevance of individual differences (i.e., self-esteem, goal orientation, leader identity, subclinical personality traits) on the developmental trajectories of leaders both in terms of leader emergence (Li et al., 2011, AB #16) and leader effectiveness or performance (Day & Sin, 2011, AB #11; Harms et al., 2011, AB #14). Perhaps the most critical finding was that of Day and Sin (2011, AB #11), who found that over a 13-week time period ratings of leader effectiveness during a developmental course did not linearly increase, but rather displayed a quadratic trend in which effectiveness decreased and only increased slightly towards the end of the course. These findings are consistent with theoretical perspectives which suggest that leader development does not always imply positive and linear change (Day & Sin, 2011, AB #11).

Practically, these findings demonstrate that general mental ability is not a critical factor to consider with respect to leader emergence. The findings demonstrate that other motivational and personality factors play a more critical role. Although general mental ability (GMA) might be ultimately critical to leader performance or the development of more specific leadership skills, GMA appears to be unrelated to who emerges as a leader. For practical and research purposes,

these studies show that it is not reasonable to expect development to be solely positive and linear. In fact, there are likely to be individual differences in developmental trajectories.

In sum, development inherently takes time to occur, and longitudinal research is necessary and critical in order to understand leader development and leadership development over time. Many variables impact leader emergence, effectiveness, and perceptions of effectiveness during the duration of this process. In other words, certain traits (e.g., self-esteem, general mental ability, goal orientation) predict who emerges as leaders. Yet, the traits people use to judge leadership effectiveness shift as time moves forward. Importantly, leader effectiveness may have a curvilinear trajectory, rather than a linear trajectory, thereby implying that leader effectiveness may not be stable over time. By understanding these patterns of leader development over time, scholars and practitioners are better able to map progress, foster positive change, and aid in the development of leaders along the career path. This understanding of leadership trajectories over time is particularly important in a military setting, as individuals typically move up in rank and take on increasingly more leadership duties as they move forward in their military career.

Quasi-Experimental Research Designs

Longitudinal research designs are not a panacea for the methodological shortcomings in leader development and leadership development research. Another way in which more rigor can be introduced is through experimental and quasi-experimental research designs (Avolio et al., 2009, AB #9). Experimental and quasi-experimental research designs are able to address issues of causality that even well-designed longitudinal designs are unable to address. By and large, leadership interventions that are based on experimental or quasi-experimental designs have been shown to have a positive effect even when considering the category of intervention, the type of organization, level of leadership targeted, and outcomes measured (Avolio et al., 2009, AB #9). Pygmalion leadership interventions are characterized by leaders' high performance expectations, creating a supportive climate, and attributing subordinate success to the individual's own internal causes, which in turn relates to improved subordinate performance (Eden et al., 2000). Interestingly, Avolio et al. (2009, AB #9) found that Pygmalion leadership interventions demonstrate the largest effect sizes with respect to intervention success relative to newer (e.g., transformational or charismatic) and traditional (e.g., leader-follower exchange or reinforcement behaviors) interventions. Due to this finding, future research involving leadership interventions should take into account leader expectations, particularly with respect to newer theories of leadership (e.g., transformational leadership), in order to determine which aspects of leadership interventions are impactful above a shift in expectations (Avolio et al., 2009, AB #9).

Leadership interventions with experimental or quasi-experimental designs must also take into account the interaction between leadership theory and criteria in how effective an intervention is and consider the temporal effects of interventions. Avolio et al. (2009, AB #9) found that while Pygmalion leadership interventions had the largest overall effects, interventions based on newer theories had larger effects than traditional interventions when the outcomes measured were affective or cognitive in nature, whereas the reverse was true when the outcome

was behavioral. Additionally, fewer than 10% of studies included in the meta-analysis by Avolio et al. (2009, AB #9) had an intervention that lasted longer than seven days, with the most frequent intervention lasting an hour or less. Approximately one-third of the studies included had a longitudinal design to test for within-group effects. For interventions that promise lasting impacts, it is particularly important to have repeated measures that include multiple posttests to demonstrate an intervention's effectiveness over time, as demonstrated by Yeow and Martin (2013, AB #20). In this study, both the experimental and control groups improved their ratings of leader satisfaction, leader effectiveness, and extra effort in the first posttest, but only the experimental group, who received self-regulation coaching in addition to their feedback reports, demonstrated improvement at the second posttest.

Experimental designs are even stronger when coupled with longitudinal methods. For example, in a longitudinal field experiment, Lester et al. (2011, AB #15) studied the effects of a semi-formal mentoring intervention in a sample of West Point cadets over a 6-month period. Participants in the experimental group were more likely to develop leader efficacy, with those higher in negative-feedback-seeking having the greatest change in leader efficacy. Using a quasi-experimental study design with two different cohorts of MBA students, DeRue et al. (2012, AB #19) demonstrated the benefits of after-event reviews (AERs) in maximizing the value of learning from experience. The two cohorts did not overlap in the MBA program as the experimental cohort entered 2 years after the control cohort. AERs were conducted within two weeks of four developmental experiences that were common to each cohort. The AERs had a positive main effect on leadership ratings after the developmental experiences, while controlling for the initial measurement of leadership ratings. Additionally, the participants who were higher in conscientiousness, openness, and emotional stability showed more benefit from the AERs, as did the participants who had experienced more developmental challenges in their careers prior to the MBA program.

The ability to design and conduct true experiments within organizations is oftentimes unrealistic as there are limited means of random selection and random assignment. Quasi-experiments offer an avenue to improve attributions of causality in these cases, though not all quasi-experimental designs are created equal (Cook et al., 1990). Organizations such as the U.S. Army have aspects of their institutions that are amenable to cohort designs in which one cohort may serve as a treatment or experimental condition while a preceding or subsequent cohort can serve as the control group (Cook et al., 1990). The use of these designs ultimately allows researchers to optimize organizational flexibility and strengthen the causal attributions of their work as seen in Lester et al. (2011, AB #15) and DeRue et al. (2012, AB #19).

Social Network Analysis

Although the methodological suggestions from above are relatively established techniques, there are other new and promising methodologies that may provide great benefit to the field. Leadership research has a long history of shifting paradigms and viewpoints that dominate the literature at any given point in time (Lord et al., 2017, AB #24). However, a common thread that runs through this history is the belief that leadership is a relational

phenomenon (Carter et al., 2015, AB #23). Although this common thread exists, our understanding and conceptualization of leadership has become more sophisticated (Lord et al., 2017, AB #24). Contemporary definitions emphasize that leadership is inherently context dependent, patterned on unique relationships between dyads (e.g., leader and follower), and is not restricted to only those in formal leader positions (Carter et al., 2015, AB #23). Social network analysis is a particularly suitable methodology for studying leadership that addresses more contemporary conceptualizations and allows researchers to study individuals and the collectives within which the individuals are situated (Carter et al., 2015, AB #21).

Social network analysis can be defined as, “a set of theories, tools, and processes for understanding the relationships and structures of a network” (Hoppe & Reinelt, 2010, p. 601, AB #10). The networks are often visualized as graphs with people within a network represented as “nodes”, and the relationships between people in the network represented as “links” between nodes. Aspects of the network can be quantified to capture how influential an individual is within the network. Some of the common metrics used in social network analysis are betweenness centrality and indegree centrality. Betweenness centrality is a measure of how often a person is an intermediary link on the shortest path between two unconnected individuals within a network (Freeman, 1979). Indegree centrality is a measure of the number of ties that a person has in a network as reported by the other members of the network (Freeman, 1979). Social network analysis allows for the assessment of both the individuals in the network (nodes) and the network as a whole.

With respect to leader development and leadership development, a social network focus offers a unique approach targeting both individual and collective change. In a survey of leader development practitioners, a majority report having facilitated development initiatives oriented on helping an individual improve their networks at work or facilitating the development of an entire group or collective (Cullen-Lester et al., 2017, AB #23). Development initiatives that are focused on improving a social network may take a few different approaches: (a) developing an individual’s general social competence, (b) helping an individual shape a specific network, and (c) helping a collective collaboratively improve the network quality (Cullen-Lester et al., 2017, AB #23). Although the network perspective to leader development seems to be quite prevalent, practice seems to be slightly ahead of leader development and leadership development research and theory (Carter et al., 2015, AB #23; Cullen-Lester et al., 2017, AB #23).

Social network analysis can be used to answer a wide variety of questions, such as how leaders emerge within groups (Kwok et al., 2018, AB #25). In a sample of adolescent cadets enrolled in the Royal Canadian Air Cadet Program, Kwok et al. (2018, AB #25) demonstrated that the indegree centrality of a cadet (or the number of people that reported a friendship tie to a cadet) mediated the relationship between that cadet’s leader role identity and their emergence as a leader (using trainer and peer ratings) during a 6-week training course. The application of social network analysis to questions related to leader development and leadership development is relatively new, but offers a lot of promise to the field and its methodology is well suited for more recent conceptualizations of leader development and leadership development that involve groups or teams of people (Carter et al., 2015, AB #23).

Despite the advantages offered in social network analysis, it is not without its own set of issues and challenges (Hoppe & Reinelt, 2010, AB #10). Social network analysis comes with its own set of privacy concerns and ethical issues as each individual reports on their relationship with others by name, making it difficult for anyone to truly opt-out. For example, if Person A decides to not respond to the survey because Person A believes that the survey will keep them out of the survey results, Person A may still be included if Person B reports a network tie with Person A. In this situation, Person A would have to be completely removed from any network roster that contains reports from other members. Another related issue is that social network analysis is more sensitive than traditional surveys to missing data. Acquiring accurate individual and network metrics requires a survey response rate of at least 75% (Borgatti et al., 2006). In the event that an adequate response rate is achieved to conduct a network analysis, there are issues of oversimplification and misuse or misinterpreting network metrics (Hoppe & Reinelt, 2010, AB #10). An overreliance on the visualization of a social network can lead to a misinterpretation of results, as the same network data can be visualized in a variety of ways to lead to different conclusions. The overreliance on the visualization of the social network is more of a practitioner concern. However, researchers can still misuse or misinterpret network measures. For example, a measure of centrality in a friendship network has a very different meaning than centrality in reference to an advice network. Additionally, many network metrics can interact with the overall network size (Anderson et al., 1999). Many of the current social network analysis studies involve descriptive or case study approaches, but individual and network metrics have the potential to be used in more rigorous research (Carter et al., 2015; Cullen-Lester et al., 2017).

Social network analysis provides a unique opportunity to assess leadership development at the collective level. For example, an analysis of network features in different squads or platoons could be related to overall group performance. Social network analysis could also be used to evaluate leaders in terms of their influence capabilities and the influence structure of personnel under their command. The use of sociometric methods in leader development practice is quite prevalent and is used to help leaders and organizations better understand the social systems, formal and informal, that are operating within their purview (Cullen-Lester et al., 2017, AB #23). Though social network analysis and visualization may be more prevalent in practice, more research is necessary to better understand its impact.

Building the Development Criteria

Now that conceptualization issues, methodological concerns, and alternative research approaches have been discussed, another critical topic to consider has to do with the appropriateness of leader development and leadership development criteria. Among the variables studied in leader development studies, leader emergence and effectiveness are among the most common. Although these variables are useful criteria for researchers and practitioners to gain a better understanding of the outcomes and correlates of general leader development, the variables provide little information as to what specifically is being developed. Additionally, the variables do not explain the causal mechanisms by which leader development and leadership development activities lead to emergence and effectiveness, nor do the variables explain possible feedback loops and reciprocal relationships. Moreover, the tasks and responsibilities inherent in most

leadership roles require a certain level of proficiency with respect to certain knowledge, skills, and abilities, especially at more senior strategic leadership positions. Oftentimes, organizations identify groups or clusters of knowledge, skills, and abilities that the organizations deem to be critical to their goals. However, organizations often lack a clear understanding of how to help leaders develop those required skills and competencies. Clearly, more work is needed in this research domain regarding our understanding of the skills and competencies needed for any given leadership position, how to develop those skills and competencies, as well as explaining causal mechanisms. The following section outlines suggestions for addressing these literature gaps, because the literature would benefit greatly from an improved understanding of development and utilization of more specific criteria.

Advancing Beyond Emergence and Effectiveness

Many of the studies discussed previously in this review used leader emergence or leader effectiveness as metrics of leader development. Although understanding the factors that influence emergence and effectiveness as a leader is valuable, these two outcomes lack specificity with regards to the skills and behaviors that are being developed. The skills and behaviors that contribute to an individual's emergence as a leader do not necessarily imply that the person will be effective in that capacity. Moreover, effectiveness ratings are often too broad to gain a better understanding of what contributed to others' perceptions of their effectiveness.

However, beyond these two common leader development and leadership development criteria, there are a variety of taxonomies that outline requisite skills and capabilities that are relevant to leadership. These skills models are typically behaviorally based and are often developed in a bottom-up fashion (Campion et al., 2011). One such model is the leadership skills strataplex, which attempts to capture the leadership skill requirements at different organizational levels (T.V. Mumford et al., 2007, AB #27). The leadership skills strataplex is organized around four broad categories: (a) cognitive skills, (b) interpersonal skills, (c) business skills, and (d) strategic skills. Each broad category has a number of subskills that were previously proposed or studied (e.g., active learning and critical thinking as cognitive subskills). Another model of leadership capabilities was proposed with a specific focus on general capabilities that the authors thought were developable, which include: (a) self-management capabilities, (b) social capabilities, and (c) work facilitation capabilities (McCauley & Van Velsor, 2004). Yet another model focuses specifically on the cognitive component, proposing nine critical cognitive skills necessary for leader performance: (a) problem definition, (b) cause and goal analysis, (c) constraint analysis, (d) planning, (e) forecasting, (f) creative thinking, (g) idea evaluation, (h) wisdom, and (i) sensemaking (M.D. Mumford et al., 2017, AB #34). Each of these skills-based models has a leader-centric approach in which the improvement of leadership outcomes is assumed to be mostly dependent upon the qualities of an individual leader.

In seeking to outline the skills and behaviors necessary for leadership development at the collective level, Friedrich et al. (2009) proposed three domains of collective leadership behavior: communication, network development, and leader-team exchange. In a low fidelity leadership simulation, Friedrich et al. (2016, AB #33) examined how each behavior was used in response to

different written scenarios that varied based on the focus of the task (i.e., strategic or innovation focus), type of problem to be resolved (i.e., task- or person-focused) and the network characteristics of the hypothetical team involved (i.e., network size, network density, network embeddedness). Leader-team exchange behaviors were used more in innovation scenarios and task-focused problems. Communication and network development behaviors were used more in strategic change than in innovation scenarios. The only network characteristic that influenced the collective leadership behavior was embeddedness, in that they were used more in less embedded teams.

Given the conceptualization of leader development as a long-term process, some proximal indicators of leader development at both the individual and collective levels have been proposed as signs that development is occurring (Day & Dragoni, 2015, AB #6). At the individual level, along with specific knowledge and skills, components of an individual's self-concept have been advanced as proximal indicators of development (i.e., leadership self-efficacy, leader self-awareness, and leader identity). The reasoning is that if a person views themselves as a leader, has a high degree of confidence in their ability to behave as a leader, and has an accurate self-perception of their ability as a leader, they will have a greater chance at further developing relative to those who do not hold the same views about themselves (Hannah et al., 2008). At the collective level, when teams feel psychologically safe, possess an awareness of each team member's expertise, and share a similar mindset regarding leadership, the collective's capacity for leadership development becomes more likely (Day & Dragoni, 2015, AB #6).

Assessing Leadership Competencies

Although the skills- and behavior-based leadership models discussed above represent promising directions for assessing leader development and leadership development, another approach also represents a fruitful direction for future work. That is, competency models as criteria for leader development and leadership development. Many leader development and leadership development initiatives are framed around the development of leadership competencies. The Office of Personnel Management (OPM) defines a competency as, "a measurable pattern of knowledge, skills, abilities, behaviors, and other characteristics that an individual needs to perform work roles or occupational functions successfully" (OPM, n.d.). Competency models are multifaceted and are typically linked to organizational strategy more than skills-based models are (Campion et al., 2011). Moreover, competency models are usually developed in a top-down fashion, they describe how competencies can change or progress for a given employee level, and competency models sometimes include considerations of future job requirements (Campion et al., 2011). Though there have been many critiques of competency models, the models are useful frameworks for conceptually linking organizational strategy to leader development processes (Campion et al., 2011; Day et al., 2009b, AB #28). Competencies can be difficult to assess, often as a result of conceptual ambiguity (Stevens, 2013). However, when well defined and based on sound theory and methodology, competencies are easier to measure and produce more generalizable results (Stevens, 2013).

Among the most common methods of competency ratings is the use of 360-degree ratings from supervisors, peers, and direct reports. Previously discussed articles (Braddy et al., 2014, AB #30; Gentry et al., 2015, AB #32), utilized the Benchmarks® assessment (Center for Creative Leadership, 2007), which contains measures of task-oriented and relationship-oriented leader behaviors as well as behaviors indicative of career derailment. Another common way in which competencies are assessed is through the use of assessment centers. In examining the effect of global work experience on a strategic thinking competency, Dragoni et al. (2014a, AB #31) utilized assessor ratings from five different assessment center activities, which included a behavioral interview, in-basket, and three meetings (i.e., with direct report, customer, and team).

In a longitudinal field study, Dai et al. (2010, AB #29) examined competency growth of financial service managers in a leader development program. Each manager was rated by their supervisor, three peers, and three direct reports on 67 competencies that were representative of 6 factors. Separately, each competency was rated by the test publisher for degree of developmental difficulty. Managers exhibited greater improvements on competencies they selected for development compared to those that were not selected, a change that was greater than would be expected by regression to the mean. Additionally, the managers exhibited smaller improvements on competencies that were identified as difficult to develop. Interestingly, there was no significant effect of developmental difficulty on the selection of competency for development by managers.

Beyond the use of self-report surveys, 360-degree ratings, and assessment center ratings, there are a limited number of options for assessing leader competencies. One intriguing avenue for assessing leader development is through social network analysis. Although much of the research involving social network analysis is descriptive in nature, there is a growing call for utilizing network analytic approaches to validate models of leader development and interventions (Cullen-Lester et al., 2017, AB #23). For example, social network analysis could be used to better understand the informal structures within a team (e.g., trust, communication, or advice ties), and whether a leader has the competence and skills to improve those structures (Cullen-Lester et al., 2017, AB #23). Social networks can be studied in order to assess how individual differences relate to an individual's network, how a leader shapes their social network, and how the structure of an individual's network or their position within it influences leadership outcomes, such as leader development.

Another promising application of social network analysis is in the study of relative leader-member exchange, or the examination of how an individual's relationship with a leader relative to their coworkers within a team influences outcomes (Hu & Liden, 2013; Sparrowe & Liden, 2005). Given the importance of supervisors and organizational context in the leader development and leadership development process, this avenue of research could prove valuable in understanding how social influence develops and functions in a complex team context (Sparrowe & Liden, 2005). Given the prevalence of digital technologies in the workplace, leadership networks can also be studied by using more unobtrusive means, such as digital communication data, instead of being reliant on self-report survey data (Carter et al., 2015, AB #23). Although the methodology and theory are still emerging, social network analysis is a

methodology capable of capturing the dynamic and complex nature of leadership in a manner that is unique from previous methodologies (Carter et al., 2015, AB #23; Cullen-Lester et al., 2017, AB #23; Hoppe & Reinelt, 2010, AB #10).

Developmental Experiences, Readiness, and Leader Identity

So far, we have discussed topics surrounding the conceptualization of leader development and leadership development, methodological concerns, such as alternative research approaches, as well as building criteria for leader development and leadership development. However, extending beyond these topics, a final consideration worth discussing involves the components of experience that are critical to development, as well as identifying who will best capitalize on development. One of the primary ways in which leaders are expected to develop is through experience. Whether it be formal job training, challenging and novel job assignments, or self-initiated experiences, there is an intuitive link between experience and the development of leadership skills. One of the many challenges in making the clear connection between experience and development is deciding the best way to capture the components that make an experience developmental in nature. In other words, it is important to determine what features of assignments are thought to be developmental and it is also important to determine how those features should be measured. In the event that those features are appropriately captured, it is not a given that individuals will respond to developmental experiences in the same way. Some individuals will inevitably be more capable and ready than others to capitalize on developmental experiences. Accounting for the components of experience that are critical to development and identifying who will best capitalize on development are two of the most important issues organizations must consider as the organizations develop their future leaders.

Developmental Experiences

One of the foundational tenets of leader development research is that development is driven heavily by experience. Although this tenet makes intuitive sense, defining how experience drives development has proved a much greater challenge. Experience can be conceptualized into quantitative and qualitative components (Tesluk & Jacobs, 1998). The quantitative component is often conceptualized in terms of the length of time performing a job. The quantitative component may also be conceptualized as the length of time or number of times a task has been performed. The qualitative component of experience can be conceptualized in terms of variety of different tasks and responsibilities within a job, how challenging the tasks within a job are, or how complex the tasks are within a job. Research has shown that it is much more than just tenure within a career, job, or organization, but rather the qualitative aspects of experience that are most impactful for development.

Research by the Center for Creative Leadership led to the development and validation of the Developmental Challenge Profile (DCP), a tool to assess developmental potential in management positions (McCauley et al., 1994). DCP identified six factors of managerial positions that contribute to development: unfamiliar responsibilities, proving yourself, developing new directions, high stakes, managing business diversity, and job overload. In the

interest of assessing the qualitative components of self-development activities, Orvis and Ratwani (2010, AB #41) proposed five key aspects of these activities: content relevancy, learner engagement, challenge, structure, and experiential variety (please see AB #41 for a listing of these five attributes and their definitions). The leader self-development process is modeled in Reichard and Johnson (2011, AB #46), though an important component of the model is the organizational context within which leaders are engaging in self-development. Though leader self-development may be more cost-effective than formal leadership education and training, the organization must strategically prepare the context within which self-development is occurring.

Leader development via experience gets more complex when you consider that certain leadership skills become increasingly more important at higher levels of leadership (T. V. Mumford et al., 2007, AB #27). In a study of U.S. government employees, the skill requirements for four broad leadership skills (i.e., cognitive, interpersonal, business, and strategic) were examined in relation to organizational level (T. V. Mumford et al., 2007, AB #27). The skill requirements for all four skills were positively related with organizational level, but the type of skill moderated the relationship because strategic and business skills became increasingly important (i.e., had the steepest slopes) at the higher organization levels. In a separate study, it was found that developmental challenge as rated by focal leaders (measured using the Developmental Challenge Profile) displayed curvilinear relationships with interpersonal and business leadership skill development as rated by supervisors (DeRue & Wellman, 2009, AB #40). DeRue and Wellman noted that this finding supported the notion that there might be diminishing returns with work assignments that were too challenging. However, strategic leadership skill development exhibited a positive linear relationship with developmental challenge, indicating that different skills were likely to develop differently in response to job challenges.

In a large-scale cross-sectional study of Army officers, Mumford et al. (M. D. Mumford et al., 2000a, AB #35) studied how more specific leadership skills differed at different levels of experience by comparing junior, mid-level, and senior level officers. Mumford et al. found that skill increases in complex problem solving, solution construction, and creative thinking were associated with work assignments characterized by the following: problems with multiple components, long-term planning, novel and ill-defined problems, diverse experiences, autonomy, and boundary spanning assignments. Additionally, Mumford et al. found that basic technical training had a stronger relationship to skill increases from junior to mid-level officers, whereas advanced professional training that emphasized the development of complex problem-solving skills had a stronger relationship with skill increases moving from mid-level to senior officers. Both of these studies highlight that certain leadership skills become increasingly important at higher levels of organizational leadership, and that certain types of work experiences contribute more than others to development (M. D. Mumford et al., 2000a, AB #35; T. V. Mumford et al., 2007, AB #27).

Clearly, type of experience plays a large role in the leader development process. Experiences do not need to be formal leader development programs either, as demonstrated by Seibert et al. (2017, AB #56). Informal development opportunities experienced by first-line

managers (i.e., developmental job challenge and developmental supervision) were related to supervisor ratings of leadership effectiveness and promotability, largely via the manager's leadership self-efficacy. Formal developmental experiences proved influential when there were either low or high levels of informal developmental experiences. Specifically, in relation to strategic thinking, the accumulation of work experience, or the varied number of roles (i.e., contributor, manager, lead strategist) an individual has had in completing a leadership-related task was shown to be related to the strategic thinking ability of executive leaders (Dragoni et al., 2011, AB #44). Further study of experiences in relation to strategic thinking found that global work experience (i.e., international work assignments, managing multinational businesses, and building multicultural relationships) was positively related to strategic thinking ratings of upper-level managers (Dragoni et al., 2014a, AB #31). These relationships were stronger if the global work experience occurred in a more culturally different context than the manager was used to.

Although it makes intuitive sense that developmental experiences aid in leadership skill development, experiences do not occur in a vacuum. The context within which a leader develops is also quite important. As leaders develop and adjust to evolving roles, having supportive supervision in the form of role modeling and provision of job information helps leaders better understand their role and more appropriately allocate their time in leading others (Dragoni et al., 2014b, AB #48). Leaders with greater access to feedback display greater skill development as reported by their supervisors (DeRue & Wellman, 2009, AB #40). Having supportive supervision can be particularly important for younger leaders. A study of West Point cadets found that cadets in a semi-formal 6-month mentorship program had higher post intervention levels of leader efficacy compared to their nonmentored peers, and that leader efficacy was positively related to a cadet's performance ratings (Lester et al., 2011, AB #15). Ultimately the benefits of having a supportive developmental environment extend beyond just the skills that leaders are developing. Organizational support for development (e.g., training, workshops, leader-member exchange, career mentoring), when employees perceive future career opportunities within an organization, is related to better performance and lower probability of turnover (Kraimer et al., 2011, AB #45; Zaccaro et al., 2015, AB #50).

Ultimately, adult learning and development is a distinct topic within the learning and development literature. Conceptualizations of adult learning assume the learner is a more active and self-directed participant in the learning process (Day et al., 2009c, AB #38). Perhaps one of the more influential learning theories is Experiential Learning Theory (D. A. Kolb, 1984; A. Y. Kolb & D. A. Kolb, 2005). According to Experiential Learning Theory (ELT), in order for learning to occur via experience, a leader must be actively involved in the learning experience. The leader must then have the ability and time to reflect on the experience (reflective observation), conceptualize the experience in the abstract (abstract conceptualization), and then apply ideas gained from the experience in new contexts (active experimentation). Among the core propositions to the theory is that all new learning must be compared and consolidated with existing knowledge, making it an ideal theory for framing research in the context of adult development.

Perhaps one of the most notable contributions of Experiential Learning Theory is that it provides testable propositions to further inform the leader development literature. Research influenced by ELT has demonstrated support for the importance of reflective observation in the leader development process. In a quasi-experimental study with Israeli soldiers, Ellis and Davidi (2005) manipulated the content of after-event reviews (AERs) as a part of a training course. The AERs in the experimental group were focused on the soldiers' experiences of both success and failure in the training course, whereas the comparison group was focused solely on failure. Performance improvement was greater when the reviews concentrated on both success and failure, compared to when the AERs were solely failure focused. The efficacy of after-event reviews was also supported in a sample of first year MBA students (DeRue et al., 2012, AB #19). The experimental group received facilitated review sessions modeled after U.S. Army AER protocols at the end of four developmental experiences that were common with the control group. The AERs had a positive main effect on leadership ratings over the initial (Time 1) measurement. Participants who had experienced greater developmental challenge in their careers benefitted more from the AERs relative to those with relatively less developmental challenge.

Developmental Readiness

The promise and potential of developmental experiences alone does not guarantee that the experience will be a benefit to each person equally. People are not blank slates when they begin working in an organization. People have their own unique skillsets, capabilities, and life experiences going into a developmental period. The leader development literature has yet to fully address what constitutes developmental readiness (Day & Thornton, 2018, AB #7). Further attention is needed in order to understand when an individual is ready to capitalize on developmental experiences. Similarly, there is a need in the leadership development literature to understand which existing constructs serve as catalysts of development instead of the proliferation of new constructs (DeRue et al., 2011, AB #43). DeRue et al. (2011) suggest that this research need can be met by using more longitudinal methodology.

Developmental readiness is defined as, "the ability and motivation to attend to, make meaning of, and appropriate new leader KSAs (knowledge, skills, abilities, and attributes) into knowledge structures along with concomitant changes in identity to employ those KSAs" (Hannah & Avolio, 2010, p. 1182, AB #42). As implied in the definition, developmental readiness can be broken down into two dimensions: ability to develop and motivation to develop (Avolio & Hannah, 2008, AB #37; Hannah & Avolio, 2010, AB #42). Each of these dimensions contains three components. Ability to develop is thought to be driven by leaders' self-awareness, self-complexity, and metacognitive ability, whereas motivation to develop is composed of leaders' interests and goals, learning goal orientation, and developmental efficacy (Avolio & Hannah, 2008, AB #37; Hannah & Avolio, 2010, AB #42).

The ability to develop is likely an important consideration in determining who will capitalize on developmental opportunities. In the training literature, individual characteristics such as self-efficacy, locus of control, conscientiousness, goal orientation, and motivation to learn are all critical factors that influence the success of a training implementation (Colquitt et

al., 2000; Salas et al., 2012). In the context of developmental experiences, Zaccaro et al. (2015, AB #50) demonstrated that complex problem solving and divergent thinking skills were significantly related to developmental experiences for U.S. Army officers over the course of their career, and that these skills were subsequently related to continuance in the Army. As defined by Hannah and Avolio, ability to develop refers to much more than cognitive ability skills and incorporates concepts related to the understanding and reflection on the self. Self-concept clarity refers to the degree that self-beliefs are well-defined, consistent, and stable (Campbell et al., 1996). With respect to leader complexity, more cognitively complex leaders are considered to be better able to interpret and process information related to their development and to integrate new information with existing information (Hannah & Avolio, 2010, AB #42). Leaders of greater metacognitive ability are expected to have more in-depth processing of their developmental experiences, and these leaders should have more capacity to regulate their cognitions. Ability to develop in this context of developmental readiness is more than just whether a leader has the requisite complex problem-solving skills. Rather, a leader's ability to develop in this context depends on the leader's ability to be cognizant of the factors that influence their ability to use the requisite skills.

As proposed by Hannah and Avolio (2010, AB #42), the motivation to develop may be comprised of one's interests and goals, goal orientation, and developmental efficacy. Of these proposed components, goal orientation is thought to be a more stable individual difference. The entire set of components proposed to constitute developmental readiness have largely been studied separate from each other. In longitudinal field studies of military cadets, learning goal orientation, metacognitive ability, and self-concept clarity all moderated the levels of development in different leadership behaviors and predicted leader performance (Hannah & Avolio, 2007). In order to gain a clearer picture of which skills, attributes, and abilities are drivers of development the skills, attributes, and abilities must be studied in the context of one another and in a manner that is appropriate for developmental research.

In an integrative literature review of the study of leader individual differences and subsequent effects on leadership outcomes, Zaccaro et al. (2018, AB #57) distinguished between two types of leader attributes: foundational traits and leadership capacities. Foundational traits were defined as individual differences (e.g., personality, cognitive abilities, motives, values) that predisposed an individual towards leadership roles and/or aided in the growth of specific leadership skill sets. Leadership capacities (e.g., cognitive skills, social capacities, knowledge, expertise) were defined as knowledge, skills, abilities, and leadership styles that influenced leader behaviors in different leadership contexts. The authors emphasized the importance of research that examined how patterns of traits and capacities were related to leadership outcomes, in order to better understand how combinations of attributes influenced each other.

This emphasis of a more person-centered approach that emphasizes how patterns of traits, relate to leadership outcomes is not necessarily new. One study of the patterns of leader characteristics was done at the end of the 20th century, which measured the motivational attributes (i.e., achievement motivation, dominance motivation, and commitment to social systems), personality characteristics (i.e., openness, Myers-Briggs Type Indicator), and ability

(i.e., verbal reasoning, writing) of leaders at different career stages using cluster analysis to examine the prevalence of different “types” of leaders at junior versus senior levels (M. D. Mumford et al., 2000b, AB #36). Three types of leaders (i.e., Motivated Communicators, Social Adaptors, and Thoughtful Innovators) were equally or more prevalent at the senior level of leadership compared to the junior level. This finding implied that leaders who fit into the above three leader types were likely to move into senior leadership positions in the future. Regardless of the focus on person-centered or variable-centered models, more longitudinal research is needed in order to understand what truly drives development (Zaccaro et al., 2018, AB #57).

Although there is a body of research investigating leader attributes and individual differences, that in which influences leader development, the field would also benefit from incorporating theories and models from other disciplines such as adult development (Day et al., 2009d, AB #39). One such model is the Selection-Optimization-Compensation (SOC) model (Baltes, 1997; Baltes & Baltes, 1990), which proposes that specific goal and resource-management oriented behaviors (i.e., selection, optimization, compensation) can help individuals age successfully in terms of well-being and functioning throughout their lifespan (Day et al., 2009d, AB #39; Moghimi et al., 2019, AB #58). Selection broadly refers to the identification and setting of goals, optimization refers to the acquisition and investment of resources in order to achieve selected goals, and compensation refers to the management of resources in response to losses that threaten the ability to maintain goal pursuit and relevant functioning (Day et al., 2009d, AB #39; Moghimi et al., 2019, AB #58). By engaging in these strategies, individuals are expected to benefit in their development with respect to their well-being, effectiveness, and career development.

Specifically, with regard to career development, the strategies of selection and optimization are positively related to career satisfaction, whereas pay, responsibility, and assuming leadership positions were positively related with optimization (Abele & Wiese, 2008). The use of SOC strategies have a positive relationship with a positive focus on career opportunities (Zacher & Frese, 2011). In a sample of undergraduate students, Day and Sin (2011, AB #11) tracked leader effectiveness ratings made by peer advisors of undergraduate students in a 13-week leadership course. Leader effectiveness was measured at four time points. Students who engaged in more goal selection were more likely to have a positive and linear trajectory (as opposed to a negative quadratic curve), relative to those who were less selective.

There is no shortage of constructs or strategies that have been proposed as important factors in leader development. However, these constructs and strategies have not been studied in a manner in which we can be definitive about what truly drives development. As in a previous section of this review, a more long-term focus is needed to study the factors that influence skill development and career trajectory over time.

Leader Identity

Finally, in addition to developmental experience and readiness, another critical topic to consider involves leader identity. In conceptualizing the process of leader development, Day and

Dragoni (2015, AB #6) drew attention to proximal indicators of development. One of the indicators was leader identity, with the assumption that as leader identity developed and matured within an individual, the individual's motivation to practice important leadership skills increased, thereby creating positive spirals of learning and applying new skills (Day et al., 2009a, AB #1; Lord & Hall, 2005). In one of the few longitudinal studies of leader identity and leader effectiveness, Day and Sin (2011, AB #11) reported that individuals with stronger leader identity were rated by others as demonstrating more effective leadership across four measurement periods. It is important to note that leader identity spirals may also be negative, by which individuals who do not endorse a strong leader identity are likely to be less willing to engage in leadership behaviors (DeRue & Ashford, 2010).

The identities involved in leadership are leadership and followership. Leadership identity is defined as, "a sub-component of one's working self-concept that includes leadership schemas, leadership experiences, and future representations of oneself as a leader" (Epitropaki et al., 2017, p. 107, AB #52). Followership identity refers to, "a sub-component of one's working self-concept that includes followership schemas, followership experiences, and future representations of oneself as a follower" (Epitropaki et al., 2017, p. 107, AB #52). Leadership and followership identities can be studied at different levels of the self: the personal level, relational level, and collective level (Epitropaki et al., 2017, AB #52). At the personal level, an individual considers their own personal characteristics, interests, values, and resources and compares them with others to inform their self-identity (Brickson, 2000). At the relational level, the self is defined by interpersonal relationships with specific people, and in the case of leadership this is often in terms of leader-follower relationships. Finally, at the collective level, an individual's sense of identity is influenced by membership in collectives or social categories such as teams or organizations.

The levels at which a leader's identity is operating has important implications for leader behavior. As previously discussed, individuals with stronger leader role identities are more likely to emerge as leaders (Kwok et al., 2018, AB #25). Individuals with a strong sense of organizational identification are themselves more likely to be seen as leaders, and these individuals are more likely to see others as sources of leadership (Chrobot-Mason et al., 2016, AB #51). An individual with a strong sense of team identity is also more likely to endorse others as a source of leadership (Chrobot-Mason et al., 2016, AB #51). In an examination of the unique effects of a leader's strength of collective, relational, and individual identities, Johnson et al. (2012, AB #47) found that these identities were positively related to average levels of transformational, consideration, and abusive leadership behaviors, respectively. Additionally, Johnson et al. found that abusive leadership behavior was more likely when leaders possessed a strong sense of individual identity and a weak collective identity. This finding supports the theory that a strong leader identity may have deleterious effects, especially depending upon the context (Heslin & Keating, 2017, AB #53).

Specifically with respect to leader development, Miscenko et al. (2017, AB #54) measured the leader identity of postgraduates in a European business school in relation to initiating structure and consideration skills, two widely studied categories of leader behaviors.

Overall, Miscenko et al found that leader identity had a positive and curvilinear growth trajectory (i.e., J-shaped). With respect to initiating structure, Miscenko et al found that when leaders reported lower levels of initiating structure skill, the leaders tended to have more rapid decreases in leader identity the following week. Regarding consideration skills, Miscenko et al unexpectedly found that when consideration skill increased, subsequent reports of leader identity decreased the following week. The study by Miscenko et al emphasized an important aspect to leadership development research and practice: Development is inherently a process of gains and losses. Additionally, given the changes in leader identity throughout the study, the study by Miscenko et al provided good evidence for the use of leader identity as a proximal indicator of development, as proposed by Day and Dragoni (2015, AB #6).

An important sub-component of leader and follower identities are leadership and followership schemas, or Implicit Leadership and Followership Theories (Epitropaki et al., 2017, AB #52). Implicit Leadership/Followership Theories (ILTs and IFTs, respectively) are the assumptions individuals maintain about the characteristics that are inherent in being a leader or follower. It has been posited that individuals who perceive a match between their ILTs and their own behaviors are expected to have higher levels of leadership efficacy and motivation to lead, whereas the reverse is true for individuals who perceive a mismatch between their ILTs and their own behaviors (Epitropaki et al., 2017, AB #52). At an interpersonal level, when employees and supervisors report holding similar ILTs, the quality of their relationships is higher relative to employees and supervisors who are different in their ILTs (Riggs & Porter, 2017, AB #55). Given the significance of leadership efficacy, motivation, and supervisor/subordinate relationship quality in leader development activities, these findings point to the importance of understanding how ILTs and FLT are formed, the accuracy of such implicit assumptions (given the respective context), and how the assumptions can be altered. Only after more is known about these implicit assumptions can researchers begin to leverage that information to improve ILTs, IFTs, the subsequent matches between a person's ILTs and their behaviors, as well as the match of ILTs between supervisors and subordinates. Ultimately, ILTs receive far more research attention than IFTs, yet both play an important role in leadership as a relational process within organizations (Junker & van Dick, 2014, AB #49) and should be researched accordingly.

Conclusion and Future Directions

Conclusion

In successful organizations, it is crucial to have the best human talent available. If you cannot promote or hire qualified, experienced individuals, then the onus shifts to developing current organizational members. The nature of war is changing, with operational environments becoming increasingly more complex, chaotic, and hypercompetitive (Department of the Army, 2016). The Army has placed emphasis on developing competent leaders and equipping them with the necessary knowledge and skills to perform successfully in these unpredictable environments. Although the Army has acknowledged and worked towards the goal of having robust and holistic development programs (Department of the Army, 2015), research in this domain is still in its infancy. The scientific study of leader development and leadership

development has only emerged in the last century. Even then, such research has progressed in a haphazard manner. Researchers have not agreed upon construct definitions, theoretical orientations, or measurement efforts, therefore leading to a disunited body of research. If the Army wants to retain and develop the most capable Soldiers, then development programs need to be constructed with the latest research in mind. Therefore, the purpose of this literature review and annotated bibliography was to better understand the trends, research challenges, and frameworks involved in the study of leader development. In reviewing the 58 publications that were annotated, four general themes were identified: (a) *Conceptualizing Development*, (b) *Alternative Research Approaches*, (c) *Building the Development Criteria*, and (d) *Developmental Experiences, Individual Readiness, and Leader Identity*. Through analysis and consideration of these themes, organizations and the Army alike can build more efficient and more successful leader development and leadership development programs.

Future Directions

Throughout this manuscript future directions and alternative approaches to research on leader development and leadership development were identified. Generally, however, there is a need for better conceptualization within this field of research. In other words, in order for this research domain to move forward in a coherent and unified manner, scientists must come to an agreement on how to define critical terms and constructs, as well as determine appropriate outcome variables. Only when this definition and determination can be accomplished will there be meaningful comparisons of findings, as well as a coherent direction for future research within the field. Furthermore, there is a need for future research to integrate more robust and comprehensive methodology. Leader development is a process that inherently occurs over time. Therefore, research would be well served by including more longitudinal methods. Additionally, parsing out causal relationships is critical in behavioral science. With that in mind, experimental and quasi-experimental research is a necessity for understanding leader development and leadership development. Moreover, leadership involves relationships and social network analysis can provide opportunities for understanding those complex relationships.

On a more practical level, an important future research need centers on the mechanisms by which experience, readiness, and leader identity contribute to leader development. Such future research requires determining what features of assignments best contribute to development, and how individual differences impact those complex relationships. Given the criticality of leader development and leadership development in today's fast-paced world, research needs to meet those demands. However, it is only through sound theory, practice, and measurement that leader development and leadership development programs can reach their greatest potential.

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Note. Asterisks (*) denote references included in the annotated bibliography.

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Appendix: Annotated Articles

LEADER DEVELOPMENT ANNOTATIONS

Organization of Annotations

Concept areas. The annotated references were categorized into four concept areas to organize the large amount of information: (a) *Conceptualizing Development*, (b) *Alternative Research Approaches*, (c) *Building the Development Criteria*, and (d) *Developmental Experiences, Individual Readiness, and Leader Identity*.

The annotations are numbered and organized by concept area from the oldest to the most recent publication dates. In-text citations include AB # following the in-text citation to indicate where the annotation can be found in the appendix.

Conceptualizing Development

- 1. Day, D.V., Harrison, M.M., & Halpin, S.M. (2009a). Understanding personal trajectories of development. In D.V. Day, M.M. Harrison, & S.M. Halpin (Eds.), *An integrative approach to leader development: Connecting adult development, identity, and expertise* (pp. 43-53). Routledge.**

This book is an excellent resource for those interested in the study of leader development. Given that leader development often involves adults, this chapter made the case that leader development research should be well aware and informed by theories of adult development. The chapter focused on methodological concerns in leader development research. The chapter stated that data that were cross-sectional in nature were simply inadequate for addressing questions that related to development. Anytime the focus of a study is on development, the most appropriate design is longitudinal.

Longitudinal research allows for the examination of inter-individual differences in trajectories and intra-individual or within-person effects. One reason longitudinal research is necessary is to examine differences in rates and trajectories in the development of individuals. For example, two individuals exposed to identical situations are likely to develop at different rates and may even develop in different ways.

Perhaps the most important factor to consider in longitudinal research is that of time, but there are many different dimensions of time that play a role. The timeframe of leader development and the time lags between data collections and/or observations are critical points of consideration. Below is a list of some of the dimensions to be considered:

- Duration of steady states (i.e., stability over time)
- Rates of change
- Incremental versus discontinuous change
- Frequency
- Rhythm
- Cycles
- Spirals

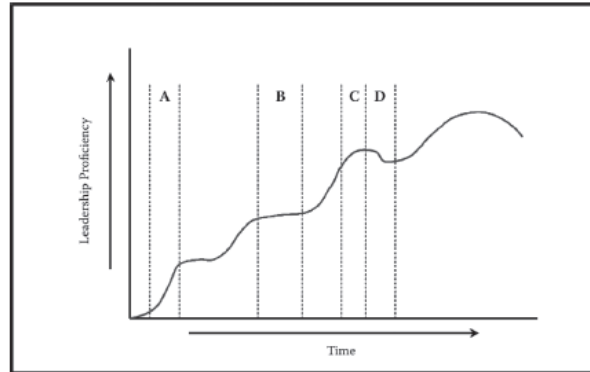


Figure 1

Growth curve of leadership proficiency across a career

Note. Figure 1 is from *An integrative approach to leader development: Connecting adult development, identity, and expertise*, by D. V. Day, M. M. Harrison and S. M. Halpin, 2009, p. 48. Routledge. Copyright 2009 by Taylor & Francis Group, LLC; Adapted from Goodwin & Haplin, 2004.

Annotator’s Comment: The chapter by Day et al., (2009a, AB #1) is a good introductory reading into why longitudinal methodologies are critical in leader development research and some of the issues of concern in conducting that research. The chapter is not a “how-to” in conducting longitudinal research. Rather, the chapter addresses why longitudinal research is necessary in answering questions related to leader development (i.e., how does a person change over time and why does a person’s development differ from another). The chapter also highlights why time frames and time lags are such an important part of any leader development study.

2. Day, D.V. (2011). Integrative perspectives on longitudinal investigations of leader development: From childhood through adulthood. *The Leadership Quarterly*, 22, 561-571.

The purpose of this paper was to summarize and integrate the findings of the other studies in this special issue on leader development. The studies were organized into groups that either used data from the Fullerton Longitudinal Study or those that were developmental trajectory studies. The authors make a clear distinction between longitudinal versus predictive research, with the former requiring at least three time points. Other important aspects of longitudinal research in leader development are that longitudinal research accounts for intra- and inter-individual change or patterns of change, utilizes a sensible time metric, and captures outcomes that are reasonably expected to change over time.

The studies using data from the Fullerton Longitudinal Study are grouped together as they used two-wave designs (Gottfried et al.; Guerin et al.; Oliver et al.; Reichard et al., 2011-same issue), even though the larger study is truly longitudinal. In summarizing the results of

these studies, it was found that childhood intrinsic motivation and approach temperaments were related to motivation and Extraversion in adolescence, which in turn were related to motivation to lead (liking to lead and leading even without benefits) and self-appraised leadership potential. These studies are very valuable, but only tell us so much about leader development. The outcomes are measured at age 29 years, when people are starting to enter into more mature stages of their careers. It is not possible to examine nonlinear effects over time in any of these studies, and some of the leadership outcomes were self-reports.

The group of developmental trajectory studies are all summarized elsewhere in this annotated bibliography (Day & Sin, 2011; Harms et al., 2011).

The paper by Day (2011, AB #2) ends with important future research considerations for leader development research. The first need in the literature is theory research on leader development. One common theme mentioned in different approaches to leader development is in reference to self-identity being central to leader development. Authentic leader development (Gardner et al., 2005), positive and negative leader identity spirals (Day et al., 2009a), and claiming-granting interactions between leaders and followers (DeRue & Ashford, 2010), all revolve around leaders adopting or negotiating an identity as a leader. The second theme important to the literature is time, in terms of the metric of time used in the study design, when development is expected to occur, and appreciating that leader development is a process that occurs over a lifespan. The last area deserving research attention is in developmental readiness to better determine who is ready to capitalize on developmental opportunities, and at what point that individual is ready. This last section discusses the methodology required to answer important questions regarding developmental readiness, in addition to pointing to factors that may influence how an individual capitalizes on developmental opportunity.

Annotator's Comment: This paper is a useful resource summarizing some of the more methodologically sound research in the burgeoning leader development field. The paper not only provides useful summaries of key research in the field, but also offers a useful distinction between longitudinal and predictive research. The paper also provides a clear summary of how the studies contribute to the literature, and it directly addresses the questions that cannot be answered by the current studies. This summary article and the studies in this special issue constitute the most informative leader development studies up to this time.

3. Murphy, S. E., & Johnson, S. K. (2011). The benefits of a long-lens approach to leader development: Understanding the seeds of leadership. *The Leadership Quarterly*, 22, 459-470.

The goal of this article was to broaden the time frame researchers consider when theorizing about leader development. Much of the literature is concerned with experiences that occur during adulthood, ignoring the likelihood that leader development starts much earlier. The paper argued that the leader development literature should invest more time focusing on leader development in childhood and adolescence. During childhood and adolescence there is a greater likelihood for development to take place, given how early the self-reinforcing process of

development may start (e.g., as an individual builds leader self-efficacy the more likely they are to engage in leadership experiences, which reinforces those beliefs).

The article noted that with, respect to leader emergence and leader effectiveness, there was still about 50%-70% of variance left unexplained after accounting for genetic factors. This unexplained variance indicated the possibility of a more meaningful influence of the environment. The factors discussed in the article included: relative age (i.e., child’s age relative to grade school peers), parenting styles, and learning experiences (e.g., organized sports and extracurricular activities). The model emphasized the need to better understand the development and trajectory of leader identity and self-regulatory processes.

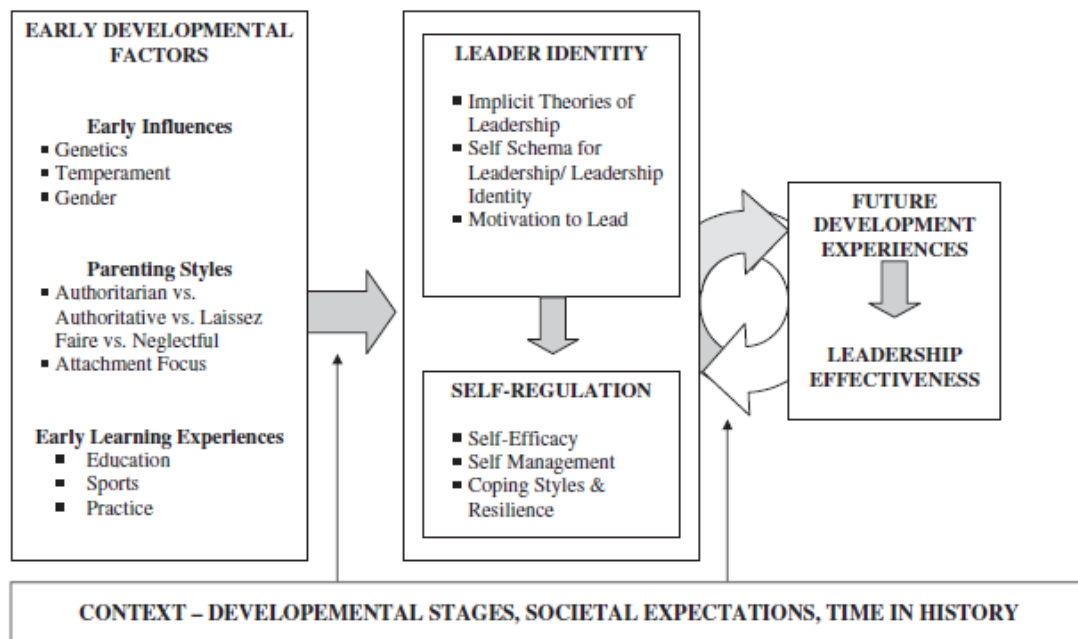


Figure 2

A life span approach to leader development

Note. Figure 2 is from “The benefits of a long-lens approach to leader development: Understanding the seeds of leadership” by S. E. Murphy and S. K. Johnson, 2011, *The Leadership Quarterly*, 22, p. 461. Copyright 2011 by Elsevier Inc.

Another important component of the model involved the context in which development was occurring. The contextual factors considered and outlined in the text included identifying inflection points or sensitive periods in which an individual was likely undergoing a leader transition, how the meaning of leadership and skills associated with leadership was likely to be different for different age groups, cultural expectations of a leader (e.g., gender, age, individualism), and the time in history in which development was occurring.

Annotator’s Comment: This study highlights factors during childhood and adolescence that have the potential to influence an individual’s concept of leadership, their self-efficacy and

identity surrounding leadership, and their overall effectiveness as a leader into adulthood. This article offers a unique perspective as a great deal of the leader development literature tends to focus on developmental experiences that occur in early or even well into adulthood, whereas the foundational and influential experiences are likely to have already occurred during an individual's childhood and adolescence.

4. **Day, D.V., Fleenor, J.W., Atwater, L.E., Sturm, R.E., & McKee, R.A. (2014)**
Advances in leader and leadership development: A review of 25 years of research and theory. *The Leadership Quarterly*, 25, 63-82.

This article chronicled 25 years of leader and leadership development literature published in *The Leadership Quarterly* (1989 – 2013). Although there is a long history of leadership theory and research, this review took the position that there was a much shorter history of rigorous studies on the topic. Leader development (i.e., development of an individual leader) and leadership development (i.e., development of processes between multiple individuals), are defined and differentiated from each other. An argument is made that the focus on identifying the “correct” leadership theory is a futile endeavor, and that emphasizing processes of leader development and leadership development in the context of adult development will be more beneficial to the field. In order to advance leadership development as a field, researchers need to understand that it is a multilevel and longitudinal phenomenon that involves both within- and between-person changes.

The discussion of the existing literature is organized around two topics – intrapersonal and interpersonal. The topics related to *intrapersonal* issues are experience and learning, skills, personality, and self-development. The topics related to *interpersonal* issues are social mechanisms (e.g., climate) and authentic leadership. Other research has focused on the *process* factors (e.g., factors that shape the rate or pattern of development) of leader development and leadership development. This literature has focused on feedback processes, self-other agreement, and the construction of self-narratives. The last area of research summarized involves applying developmental theories to the study of leader development and incorporating longitudinal designs into the literature.

The article ended with a focus on promising areas for future research. Such areas included: focusing more on process themed research that incorporates longitudinal design; more outcome research to expand beyond job performance or leader role occupation; more emphasis on personal trajectories; the broadening of the focus of development beyond an individual; the ability of people to practice leadership skills; and finding better measures of self-awareness for examining the impact of 360-degree feedback.

Annotator's Comment: This article is a useful summary to help the reader get up-to-speed on the leader development and leadership development literature, even if from the perspective of one journal. The article includes a lot of the literature cited in this annotated bibliography. Additionally, the article provides a useful guide for how future research can contribute to the literature overall in order to advance the study of leader development and leadership development.

5. **DeRue, D. S., & Myers, C. G. (2014). Leadership development: A review and agenda for future research. In D. V. Day (Ed.), Oxford handbook of leadership and organizations (pp. 832-855). Oxford University Press.**

This chapter exclusively focused on the concept of leadership development defined as “the process of preparing individuals and collectives to effectively engage in leading-following interactions” (p. 835). Inherent in the definition was that any leadership development efforts included preparing a *collective* or group to respond to leaders in addition to the development of a focal leader. The main purpose of the chapter was to provide a framework for leadership development. The PREPARE (*Purpose, Result, Experience, Point of Intervention, Architecture, Reinforcement, and Engagement*) framework is proposed.

Purpose refers to the motivations and strategic objectives the organization has for the leadership development efforts. *Result* refers to what the organization is actually trying to develop (e.g., improved trust or organizational climate for shared leadership). *Experience* refers to the method through which the development is expected to occur (e.g., formal training or challenging assignments). *Point of Intervention* defines the intended target of the developmental effort (e.g., individual leader skill, ability, or collective processes). *Architecture* refers to the organizational context in which the developmental effort is occurring and how it supports the effort. *Reinforcement* refers to how the developmental experiences are sequenced and at which stages. Lastly, *Engagement* refers to the commitment of individuals and groups through the process from entering to reflecting. The existing leader development and leadership development literature is discussed in relation to each of the elements.

The chapter leaves the audience with a few suggestions for future research. With regard to *Point of Intervention*, future research should focus on linking leader development with collective leadership structures and the process of leadership in collectives. Related to *Purpose*, research should focus on demonstrating whether developmental experiences are aligned with organizational strategy are more beneficial than those experiences that are not explicitly tied to organizational goals. Future research would also benefit from a better understanding of the factors that maximize the value of developmental experiences in order to address the *Engagement* element. Lastly, there is very little guidance regarding *Reinforcement*, and there is a need to better understand how skills and leadership capacities develop over time and whether sequencing of such events matters.

Annotator’s Comments: This chapter on leadership development represents a comprehensive focus on the leadership side of the leader/ship development literature. While the chapter does not ignore the development of an individual leader, it is one of the few works that prioritize the development of a collective’s capacity for leader-follower relationships and for improving those functions. Despite its unique focus, this chapter lacks a discussion of the appropriate methods that would advance the framework that is proposed.

6. **Day, D. V., & Dragoni, L. (2015). Leadership development: An outcome-oriented review based on time and levels of analyses. *Annual Review of Organizational Psychology and Organizational Behavior*, 2, 133-156.**

The purpose of this paper was to summarize and integrate theory and research involving leadership development defined as “the growth of a collective’s capacity to produce direction, alignment, and commitment” (p. 134). Leadership development involves a collective change, whereas leader development involves an individual change. The review is organized by the level of analysis at which development can be examined (i.e., individual, dyad, and team/organization) and time (i.e., proximal vs. distal outcomes). Through this review, the paper provided an integrative framework to guide future research on the complex phenomenon.

In regard to individual leader development, the article framed self-views as proximal outcomes that could indicate that development was occurring in individuals. The three constructs proposed were leadership self-efficacy, self-awareness, and leader identity. All three constructs were commonly believed to be key components of the individual development process. Leadership self-efficacy had more empirical support for its involvement in the process being linked to both motivation to lead and leader performance. The study of self-awareness and leader identity would still benefit from the utilization of dyadic approaches to leadership, as self-awareness is typically captured comparing self-other agreement and establishing a leader identity involves a process of leader “claiming” of the identity and follower “granting” the authority to behave as such. Regardless, all three constructs are proposed as proximal outcomes researchers could model to indicate the occurrence of development.

Ultimately, leader development is concerned with the development of leader knowledge, skills, and competencies. Experience is believed to be the most critical component of leader development of knowledge, skills, and competencies, mostly focused on the qualitative versus quantitative aspects of experience (e.g., type of challenge, consistency of challenge, or difficulty of challenge). The review pointed out that experience alone was not sufficient to ensure development. Support in the form of structured reflection on experience and supervisor support further facilitate development via experience.

Two human development theories are provided as frameworks to guide theory and research forward: dynamic skill theory and constructive-development/ego development theories. Dynamic skill theory makes the assumption that individuals will differ in their behavior, learning, skill stability, and trajectories during the development process. Constructive-development/ego development theories view development in terms of how individuals understand the self in relation to their environment over the lifespan, and the more complex this understanding, the greater capacity for leadership.

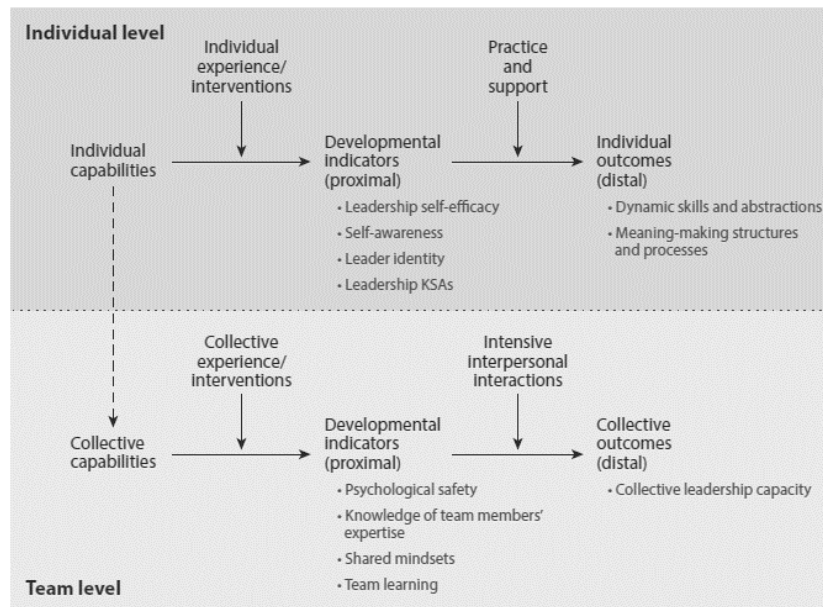


Figure 3

Multilevel summary framework of leadership development process and outcomes

Note. Figure 3 is from “Leadership development: An outcome-oriented review based on time and levels of analyses” by D. V. Day and L. Dragoni, 2015, *Annual Review of Organizational Psychology and Organizational Behavior*, 2, p. 136. Copyright 2015 by Annual Reviews.

Moving from the individual level of development, the first area in which theory of leadership development can advance is through the study of leader-follower relationships. The entity perspective contends that the quality of a leader-follower relationship and how it is perceived influences alignment and commitment from followers. This perspective typically examines formal leadership roles. The relational perspective assumes that leadership is co-created through communication interactions and leadership is socially constructed within context. Leadership development in this context involves someone “claiming” an identity (e.g., leader or follower) and another “granting” this identity.

More complex leadership theories define leadership in the context of teams and organizations in which leadership is an outcome of a social structure and process, rather than individually driven or relationally driven. Important aspects of the team or organizational environment that allow for further leadership development are psychological safety, better knowledge of each other’s expertise, a shared leadership perspective and direction, and team engagement in the learning process. Existing research on shared or distributed forms of leadership point to intense interpersonal interactions as key to the development of the group’s leadership capacity.

Annotator's Comment: This paper is a very good resource for a better understanding of both leader and leadership development, with the latter involving a focus beyond an individual leader. The main purpose of the article is to synthesize and guide leadership development research. Throughout the article, practical implications of research are presented in the sidebar and the article ends with 12 key questions that future research should explore.

7. Day, D.V., & Thornton, A.M.A. (2018). Leadership development. In J. Antonakis & D.V. Day (Eds.), *The nature of leadership* (3rd ed., pp. 354-380). SAGE Publications.

This chapter began with a vignette and supplemental discussion questions regarding an employee transitioning into a management role and the experience that employee has during the developmental process. The paper served as a useful reminder of the real-life issues leader development and leadership development researchers were trying to address. As is common in the development literature, a distinction is made between leader development (e.g., growth of individual) and leadership development (e.g., growth of a collective's capacity). The term leader/ship is introduced to indicate when both leader development and leadership development are being discussed.

Next, the common question of whether leaders are born or made is addressed. Although there is good evidence that about 24%-30% of the variance in leadership role occupancy can be attributed to genetics, that leaves a lot of variance left to be explained, a good sign for leader development research. The next question is whether leaders are capable of developing over time. The research base of studies seeking to answer this question is still emerging but has generally found that individuals experience leader development in different ways. Also, individual differences (e.g., leader identity, goal orientation, adult development processes) are likely to influence developmental trajectories.

The areas in which leaders are expected to develop are summarized from two previous articles (T. V. Mumford et al., 2007; Van Velsor & McCauley, 2004). Each framework outlines broad areas in which leaders develop. The general skills outlined in Mumford et al. (2007) fall under cognitive, interpersonal, business, and strategic skills. The capabilities outlined by Van Velsor and McCauley (2004) are organized by self-management, social, and work facilitation capabilities.

Lastly, ways organizations can promote leader development and leadership development are discussed. The topics discussed involve structured developmental programs (e.g., 360-degree feedback), leveraging and being strategic in the use of experiences to develop leaders, and incorporating a deliberately developmental approach targeted both at individuals and the organization as a whole to the organization's strategy. Ways to improve the science and practice of leader development and leadership development are also discussed.

Table 1

Two views on essential leadership skill requirements

<i>Leadership Strataplex</i>	<i>Mumford et al. (2007)</i>	<i>Developable Leadership Capabilities</i>	<i>Van Velsor & McCauley (2004)</i>
GENERAL SKILLS	SUBSKILLS	GENERAL CAPABILITIES	SUBSKILLS
Cognitive	<ul style="list-style-type: none"> • Speaking • Active listening • Writing • Reading comprehension • Active learning 	Self-Management	<ul style="list-style-type: none"> • Self-awareness • Ability to balance conflicting demands • Ability to learn • Leadership values
Interpersonal	<ul style="list-style-type: none"> • Social perceptiveness • Coordination • Persuasion 	Social	<ul style="list-style-type: none"> • Ability to build and maintain relationships • Ability to build effective work groups • Communication skills • Ability to develop others
Business	<ul style="list-style-type: none"> • Management of material resources • Operations analyses • Management of personnel resources • Management of financial resources 	Work Facilitation	<ul style="list-style-type: none"> • Management skills • Ability to think and act strategically • Ability to think creatively • Ability to initiate and implement change
Strategic	<ul style="list-style-type: none"> • Visioning • Systems perception • Identification of consequences • Identification of key causes • Problem identification • Solution appraisal 		

Note. Table 1 is from *The nature of leadership*, by J. Antonakis and D. V. Day, 2018, p. 363. SAGE Publications. Copyright 2018 by SAGE Publications Inc.

Annotator’s Comment: This chapter is one of the more recent readings summarizing the leader development and leadership development literature. The paper does a good job of considering both the academic concerns in leader development as well as the practical issues that the research should be addressing.

8. Liu, Z., Riggio, R. E., Day, D. V., Zheng, C., Dai, S., & Bian, Y. (2019). Leader development begins at home: Overparenting harms adolescent leader emergence. *Journal of Applied Psychology, 104*, 1226-1242.

Heritability estimates of leadership role occupancy fall somewhere between 24% and 30% (Arvey et al., 2006; Arvey et al., 2007; De Neve et al., 2013), suggesting that environmental factors could play a much more prominent role in leader development. This study examined the effect of overparenting, defined as, “extreme assistance or engagement behaviors provided by

parents with the good intention of attempting to enhance their child’s current or future success, but they are developmentally inappropriate for their offspring” (p. 3). This study proposes that overparenting has negative effects on leader emergence and role occupancy via self-esteem and leader self-efficacy.

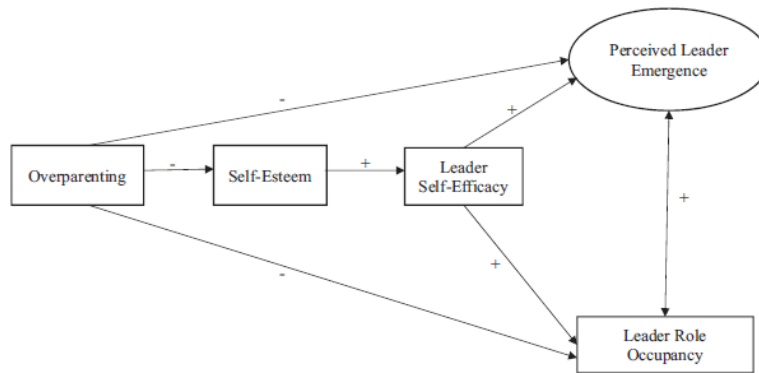


Figure 4

Conceptual model for mediation

Note. Figure 4 is from “Leader development begins at home: Overparenting harms adolescent leader emergence” by Z. Liu, R. E. Riggio, D. V. Day, C. Zheng, S. Dai, and Y. Bian, 2019, *Journal of Applied Psychology*, 104, p. 1229. Copyright 2019 by the American Psychological Association.

The focal sample consisted of 1,255 Chinese junior high students (average age = 14.2 years), from 55 classrooms across 13 different junior high schools in Beijing. Leader emergence was captured by peer, teacher, and parent ratings of the focal students. Overparenting, self-esteem, and leader self-efficacy were all measured via self-reports of the focal students.

Overall, strong support for the model was found. Overparenting was negatively related with both leader emergence and leader role occupancy. These effects were mediated by self-esteem and leader self-efficacy, such that overparenting was negatively related to adolescent leader emergence (both perceived and actual) via self-esteem and leader self-efficacy. There were notable sex differences as males reported receiving more overparenting than their female peers, and male students had lower scores on peer and teacher ratings of leader emergence. Additionally, whereas there was a direct effect of overparenting on leader role occupancy for males, there was only a mediated effect (via self-esteem and leader self-efficacy) for females, suggesting that leader emergence for females was more influenced by their self-beliefs.

Annotator’s Comment: This study emphasizes what has long been theorized about leader development: Leader development is a continuous process that includes the life span (Day et al., 2009). The implications of the study have more societal relevance than organizational (e.g., should societies invest more in the adolescent leadership development), however the study clearly demonstrates that organizations and leader training programs should be well aware that

the leader development process extends well beyond an individual's career and even entry-level employees are not entering the workforce as a blank slate with regard to leadership.

Alternative Research Approaches

- 9. Avolio, B.J., Reichard, R.J., Hannah, S.T., Walumbwa, F.O., & Chan, A. (2009). A meta-analytic review of leadership impact research: Experimental and quasi-experimental studies. *The Leadership Quarterly*, 20, 764-784.**

This meta-analysis examined the results of leadership interventions in the context of different leadership theories that influenced the interventions (i.e., traditional, new approaches, or a Pygmalion approach). Traditional interventions were characterized as emphasizing leader-follower exchange relationships, providing direction and support, and reinforcement behaviors. New leadership approaches emphasized symbolic behavior, communicating a vision, making emotional or inspirational appeals, individualized attention, and intellectual stimulation. Pygmalion interventions targeted expectations to elicit a change in behavior typical of self-fulfilling prophecies. In order to be considered a leadership intervention the researcher had to overtly manipulate leadership to examine the impact on process variables or outcomes. The purpose of this paper was to have a comprehensive estimate of the effectiveness of leadership interventions by examining experimental and quasi-experimental studies.

The meta-analysis also examined whether the effectiveness of the intervention differed by the type of outcome measured: affective, behavioral, cognitive, or organizational performance. Overall, leadership interventions had an uncorrected effect size of $d = .61$ (.67 corrected; 95% CI, [.26-1.08]). This article presented a useful way to communicate intervention effectiveness by utilizing the Binomial Effect Size Display, which compared the likelihood of participants in the treatment condition experiencing "success" with the likelihood of participants in the control or comparison group experiencing similar results. The effect size of $d = .61$ translated to participants in the treatment group being ~30% more likely than participants in the comparison group to achieve success.

Avolio et al. (2009, AB #9) also found that interventions that were focused on training and development (when investigators attempted to directly enhance an individual's knowledge, skill, motivation, etc.) had slightly smaller effect sizes than nondevelopmental interventions, where the treatment subjects were exposed to role plays, scripts, or assignment. However, the authors pointed out that those participants focused on training typically lasted longer (days vs. hours). Pygmalion interventions had the largest effect sizes across all outcomes relative to the traditional and newer interventions. New interventions had larger effects than traditional leadership interventions for affective and cognitive outcomes, whereas traditional theories had larger effects than new approaches on behavioral outcomes. Interventions with organizational performance as the outcome had the largest effect size. However, this relationship between interventions and organizational performance was tested using a small number of studies. Compared to profit and not-for-profit organizations, military samples exhibited the largest effect sizes.

Another valuable feature of this article is a presentation of how to calculate return on developmental investment (RODI) for interventions in order to better communicate to organizational decision makers a cost-benefit analysis of investing in development. After controlling for all the different moderators included in this study Avolio et al. found that significant variance still remained, indicating the presence of other moderators. The authors advised that future interventions should look to separate leader expectancies in order to examine the impact of newer theories above what could be a Pygmalion effect.

Annotator's Comment: This paper is a useful reference that summarizes the effectiveness of experimental and quasi-experimental leadership interventions. The paper also presents a detailed breakdown of the leadership theories that the interventions were based on and the outcomes measured. The paper provides useful ways for communicating the effectiveness (Binomial Effect Size Display) and utility (Return on Developmental Intervention) of interventions to organizational decision makers in a way that is more interpretable to laypersons.

10. Hoppe, B., & Reinelt, C. (2010). Social network analysis and the evaluation of leadership networks. *The Leadership Quarterly*, 21, 600-619.

This article introduced social network analysis (SNA) as a way to assess, track, and develop the social capital maintained by individual leaders as well as a collective's capacity for leadership. The paper defined social network analysis as "a set of theories, tools, and processes for understanding the relationships and structures of a network" (p. 601). The authors introduced a network classification framework that acknowledged that networks may be intentionally created or may emerge informally (Table 2).

Key concepts of social network analysis were introduced (e.g., bonding, bridging, clusters, density, betweenness and indegree centrality) and different ways of evaluating networks were discussed. For example, networks may be assessed for their connectivity (e.g., what changes in connectivity resulted from a leadership development intervention), overall network health (e.g., what is the level of trust among network members?), and network outcomes (e.g., How do changes in network outcomes and impact relate to a leadership development intervention?). Empirical examples of each network type and how it was evaluated were discussed in depth.

Table 2

Leadership network classification framework

Type of network	Description of network
Peer leadership network	A system of social ties among leaders who are connected through shared interests and commitments, shared work, or shared experiences. Leaders in the network share information, provide advice and support, learn from one another, and occasionally collaborate together. Peer leadership networks provide leaders with access to resources that they can trust. Leadership development programs often seek to create and catalyze peer leadership networks to expand the trusted ties that leaders have with one another. At other times peer networks emerge when leaders with something in common find personal benefit in sharing and connecting their experiences.
Organizational leadership network	A set of social ties that are structured to increase performance. These ties are often informal and exist outside the formal organizational structure, such as when an employee seeks advice from a colleague other than her supervisor to help solve a problem more quickly. At other times, teams or communities of practice are intentionally created to bridge silos within organizations that interfere with performance, profit, or delivering on one's mission. At the inter-organizational level, leadership networks support organizations with shared interests to produce a product or deliver a service more efficiently.
Field-policy leadership network	A network connecting leaders who share common interests and who have a commitment to influencing a field of practice or policy. These networks seek to shape the environment (e.g., the framing of an issue, underlying assumptions, and standards for what is expected). Effective field-policy leadership networks make it easier for leaders to find common ground around the issues they care about, mobilize support, and influence policy and the allocation of resources.
Collective leadership network	A self-organized system of social ties among people attracted to a common cause or focused on a shared goal. Network members exercise leadership locally. As the number of local groupings grows and there is increasing interaction, these groups begin to align and connect to form larger networks. These networks are often rooted in a sense of community and purpose; they may be driven by a desire to achieve a specific goal, or simply by the desire of each member to belong to something larger than oneself.

Note. Table 2 is from “Social network analysis and the evaluation of leadership networks” by B. Hoppe and C. Reinelt, 2010, *The Leadership Quarterly*, 21, p. 601. Copyright 2010 by Elsevier Inc.

Social network analysis is not without its pitfalls which are outlined in this paper with a focus on four concerns: (a) lack of privacy and related ethical issues, (b) making evaluations from incomplete information, (c) oversimplification, and misreading, and (d) misuse of network measures. Lastly, different issues and research implications are discussed to guide future research.

Annotator’s Comment: Leadership development theory continually conceptualizes leadership as a collective phenomenon. However, this concept is not typically operationalized in practice (with good reason, but the point still stands). This article serves a useful introduction to a specific analysis and some of the questions that can be asked in relation to leadership development. Research should be mindful, however, of the methodological difficulties in collecting and maintaining network data (e.g., not practical for large networks and difficult to assess longitudinally).

11. Day, D.V. & Sin, H.P. (2011). Longitudinal tests of an integrative model of leader development: Charting and understanding developmental trajectories. *The Leadership Quarterly*, 22, 545-560.

This study is one of the few truly longitudinal (at least 3 time points) leader development studies measuring multiple constructs at multiple time points. Central to the study is the examination of leader identity in relation to the developmental trajectory of leader effectiveness.

Individual goal orientation (learning, performance prove, and performance avoid) was also hypothesized to influence the trajectory. Lastly, adult development processes (selection, optimization, and compensation) were hypothesized to relate to different types of leader effectiveness trajectories.

Undergraduate students (n = 1315) in a leadership and team-building course, were tasked with the design, implementation, and evaluation of a service-learning project. The course was over 13 weeks with four time points of data collection (T0-3). Leader identity and leader effectiveness were the only variables measured at multiple time points.

There was a significant linear and quadratic trajectory for effectiveness ratings. The linear trend was negative, while the quadratic trend was positive, indicating a slight uptick towards the end of the course. Leader identity was modeled as a time-varying covariate of leader effectiveness. The finding was that the stronger someone identified as a leader the stronger the perception (peer adviser rating) of the individual's effectiveness over time. Learning-goal-orientation was associated with higher initial effectiveness; whereas high avoid-goal-orientation was associated with lower leader effectiveness. High learning orientation predicted in the expected direction the quadratic trends for effectiveness (more adaptive). Contrary to prediction, those lower in avoid orientation showed steeper decline in effectiveness over time relative to those higher in avoid orientation.

Two latent growth classes were identified: one dominant class (n = 1,118) where the growth curve was negative but stabilized, and one nondominant class (n = 131) where the growth curve was positive and linear. The ability of individuals to be more selective in their goals were more likely to be in the positive and linear trajectory group.

Annotator's Comment: This study is an exemplar model for the type of longitudinal research that is needed more frequently in the leader development domain. Although the sample consisted of undergraduate students in a leadership course of limited length (13 weeks), the study modeled effectiveness trends over time as well as leader identity as a time-varying covariate. The use of hierarchical linear modeling and growth mixture modeling in the study contributed to the literature by showing what covariates influenced trends in leader effectiveness. The study also made the important contribution that not everyone had the same trajectory, with about 10% of the sample having a positive and linear trajectory.

12. Gottfried, A. E., Gottfried, A. W., Reichard, R. J., Guerin, D. W., Oliver, P. H., & Riggio, R. E. (2011). Motivational roots of leadership: A longitudinal study from childhood through adulthood. *The Leadership Quarterly*, 22, 510-519.

This study looked to examine how intrinsic motivation measured in childhood related to motivation to lead measured in adulthood. Past research and theory on leader development has assumed that experiences and factors in childhood are linked to leadership outcomes in adulthood, but ultimately has fallen short in the lack of longitudinal research. This study used data from the Fullerton Longitudinal Study (FLS) to demonstrate that intrinsic academic motivation measured in childhood was related to different types of leadership motivation in adulthood.

The Fullerton Longitudinal Study was a longitudinal research investigation that started in 1979 by tracking a sample of individuals from early childhood to adulthood ($N = 106$). In this study, childhood academic intrinsic motivation was measured at 5 points (9, 10, 13, 16, and 17 years old), intelligence was measured at three points (12, 15, and 17 years old, and motivation to lead was measured at 29 years old. Three types of motivation to lead were measured: affective identity motivation, which referred to enjoying leading others; noncalculative motivation, which referred to leading regardless of costs relative to benefits of leading; and social-normative, which referred to leading due to a felt responsibility.

Academic intrinsic motivation was related to affective identity and noncalculative motivations to lead in adulthood, whereas it was not related to social normative motivation to lead. Intelligence was not related to motivations to lead in the presence of intrinsic motivation in childhood. Ultimately, children and adolescents that enjoyed learning for its own sake were more likely to be adults who were motivated to lead due to the enjoyment they got in leading and with little consideration of the costs of being in a leadership role.

Annotator's Comment: This paper is one of the many articles published in *The Leadership Quarterly* Special Issue on longitudinal leader development research (Riggio, 2011). This study clearly demonstrates a link between motivations in childhood and in adulthood. What is of note is that the motivation in childhood is intrinsic academic motivation, whereas in adulthood it is to lead. Another noteworthy finding was the lack of relationship between intelligence measured in adolescence and motivation to lead in adulthood.

13. Guerin, D. W., Oliver, P. H., Gottfried, A. W., Gottfried, A. E., Reichard, R. J., & Riggio, R. E. (2011). Childhood and adolescent antecedents of social skills and leadership potential in adulthood: Temperamental approach/withdrawal and Extraversion. *The Leadership Quarterly*, 22, 482-494.

This study examined the effects of intelligence and personality measured in adolescence on leader emergence in adulthood. A model was proposed in which social skills in adulthood mediated the relationship between Extraversion and leader emergence. The study also examined the interactive effects of Extraversion and intelligence on leader emergence.

The data analyzed in the study were from the Fullerton Longitudinal Study. Extraversion and intelligence were measured when participants were 17 years old. Social skills and leadership potential were measured at age 29. Leadership potential was measured as whether participants reported having leadership related work duties and whether the reported engaging in transformational leadership behavior.

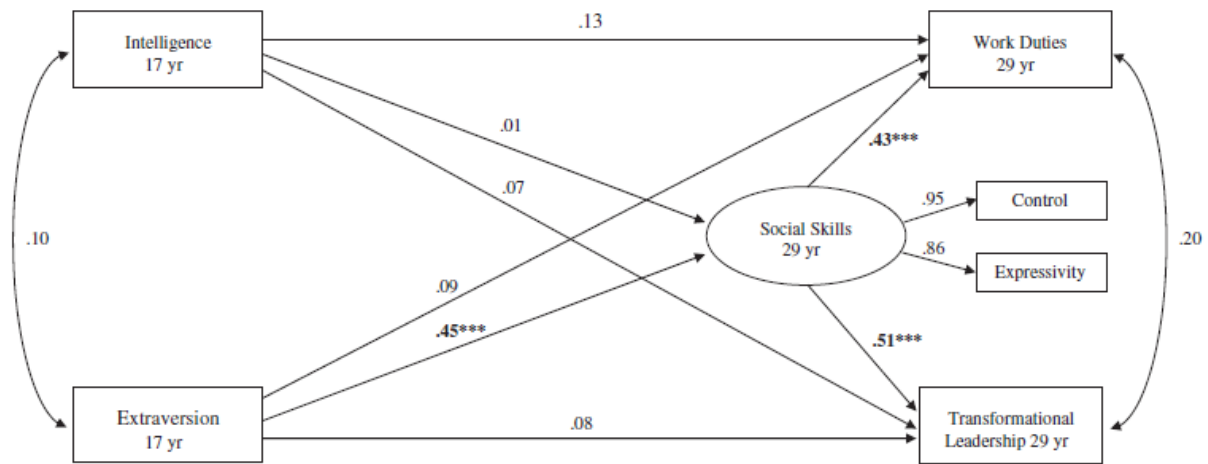


Figure 5

Relations among intelligence, extraversion, social skills, and leadership potential

Note. Figure 5 from “Childhood and adolescent antecedents of social skills and leadership potential in adulthood: Temperamental approach/withdrawal and extraversion” by D. W. Guerin, P. H. Oliver, A. W. Gottfried, A. E. Gottfried, R. J. Reichard, and R. E. Riggio, 2011, *The Leadership Quarterly*, 22, p. 488. Copyright 2011 by the Elsevier Inc.

Support was found for the mediated model, in which social skills mediated the effect of Extraversion in adolescence on leadership duties and behaviors in adulthood. In this model, social skills fully mediated the relationship between Extraversion and leadership in adulthood. Another model was tested in which leadership served as a mediator between Extraversion and social skills. Leadership partially mediated the effects of Extraversion, but Extraversion still had a direct effect on social skills beyond the indirect effect through leadership skills. Intelligence and Extraversion did not interact in the prediction of leadership potential. Furthermore, the researchers tested another developmental model in which parent reported childhood and adolescent temperamental approach/withdrawal disposition were included and their effects on leadership potential were mediated by adolescent Extraversion and social skills.

Annotator’s Comment: This study demonstrates the relevance of temperament and personality in childhood and adolescence on the leadership potential of adults. The study also demonstrates that other factors aside from intelligence, such as personality and temperament, play a more influential role on leader emergence and potential in adulthood. This study supports other findings in the FLS. Given the design of the study, it is one of the first studies demonstrating a longitudinal effect of Extraversion on variables related to leadership, with a 12-year gap between measurements.

14. Harms, P. D., Spain, S. M., & Hannah, S. T. (2011). Leader development and the dark side of personality. *The Leadership Quarterly*, 22, 495-509.

This article examined how subclinical personality traits (aspects of personality that do not disrupt day-to-day functioning but are related to negative outcomes in some circumstances) related to leader development. Previous research has examined the Big Five in relation to leader emergence and effectiveness (Judge, Bono, Ilies, & Gerhardt, 2002), but has not examined the negative aspects of personality in relation to leader development. The subclinical traits, their corresponding DSM-IV disorder, and construct descriptions are presented in the table below.

Table 3

Subclinical dimensions of the Hogan Development Survey

Subclinical trait	DSM-IV construct	Description of high scorers	DSM-IV descriptions
Excitable	Borderline	Moody and inconsistent concerns; being enthusiastic about persons, ideas, and projects and then becoming disappointed in them	Inappropriate anger; unstable and intense relationships
Skeptical	Paranoid	Cynical, distrustful, overly sensitive to criticism, and skeptical of others' true intentions	Distrustful and suspicious of others; motives of others are interpreted negatively
Cautious	Avoidant	Resistant to change and reluctant to take even reasonable chances for fear of being evaluated negatively	Social inhibition; feelings of inadequacy; hypersensitivity to criticism
Reserved	Schizoid	Socially withdrawn and lacking interest in or awareness of the feelings of others	Emotional coldness and detachment from relationships; indifferent to criticism
Leisurely	Passive-aggressive	Autonomous, indifferent to the requests of others, and often irritable when others persist	Passive resistance to performance expectations; irritable when asked to do unwanted tasks
Bold	Narcissistic	Unusually self-confident, unwilling to admit mistakes or listen to advice, and unable to learn from experience	Grandiose sense of self-importance and entitlement; arrogant behaviors and attitudes
Mischievous	Antisocial	Enjoys taking risks and testing the limits	Disregard for the truth; impulsive; failure to conform to social norms
Colorful Imaginative	Histrionic Schizotypal	Expressive, dramatic, and desires to be noticed Acts and thinks in creative and unusual ways	Excessive emotionality and attention-seeking Odd beliefs and thinking; behavior or speech that is eccentric or peculiar
Diligent	Obsessive-compulsive	Careful, precise, and critical of the performance of others	Preoccupations with orderliness, rules, and control; inflexible
Dutiful	Dependent	Eager to please, reliant on others for support, and reluctant to take independent action	Difficulty making everyday decisions without excessive advice and reassurance; unwilling to express disagreement

Note. Table 3 is from “Leader development and the dark side of personality” by P. D. Harms, S. M. Spain, and S. T. Hannah, 2011, *The Leadership Quarterly*, 22, p. 497. Copyright 2011 by the Elsevier Inc.

The sample consisted of 919 cadets at West Point Military Academy and tracked their development from Year 2 to Year 4 of their 4-year program at West Point. The subclinical traits were examined in relation to scores on 12 subfacets of their Periodic Developmental Review (PDRs) reports that assessed judgment, officership, interpersonal fairness, communication skill, response to feedback, sense of duty, fitness, courage, conduct, unselfishness, army values, and conscientiousness. Each cadet was assessed by one to six raters at the end of each year.

Each of the PDR facets showed increases over time. The subclinical traits collectively explained between 11% and 17% of the variance in the PDR dimensions. The subclinical traits of Skeptical and Imaginative were negatively related to leader development as hypothesized. The traits of Cautious, Bold, Colorful, and Dutiful were positively related to development over time and across multiple PDR facets.

Annotator's Comment: While it is a novel concept to examine how potentially troubling subclinical personality traits relate to leader development, it is unclear what these subclinical personality traits add over and above the Big 5 personality traits because the latter were not measured in this study. Future research could examine whether the subclinical personality traits add anything over and above the Big 5. Nonetheless, these findings highlight the importance of considering that the bright and dark side of personality traits can have positive or negative effects on outcomes of interest, depending on the context.

15. Lester, P.B., Hannah, S.T., Harms, P.D., Vogelgesang, G.R., & Avolio, B.J. (2011). Mentoring impact on leader efficacy development: A field experiment. *Academy of Management Learning & Education, 10*, 409-429.

This study is quite unique in that it was a longitudinal field experiment to test the effects of a mentoring intervention on the leader efficacy and subsequent performance of cadets at West Point. The study incorporated findings in the mentoring literature that most formal mentoring relationships were not as effective as informal relationships that occurred organically within an organization.

The sample included 193 West Point cadets (76 cadets in the treatment or experimental group and 117 cadets in the comparison group). The intervention occurred over a 6-month period. Demographic variables and preintervention levels of leader efficacy were measured at Time 1. Trust in mentor or leader, feedback-seeking orientation, and postintervention levels of leader efficacy were collected at Time 2. Finally, performance ratings were collected 3-4 weeks after Time 2 for each cadet. Participants in the treatment condition were put in a semiformal mentorship program, where protégés were free to select a mentor among the staff and faculty at the military academy. Participants were required to meet six times across an academic semester and were given goals for each meeting (i.e., Session 1: Establish basis of relationship, with protégés writing essays about what they wished to gain; Session 2: Help protégé diagnose prior leadership challenges, where discussions centered on taking charge as a leader and solving similar challenging problems; Session 3: Focus on protégés' personal developmental goals, and mentor-protégé pairs discussed methods and opportunities to achieve those goals; Session 4: Focus on how to effectively lead during ethically or morally ambiguous situations; Sessions 5 and 6: Mentor-protégé pairs were able to select a topic of choice). Additionally, protégés had to conduct two interviews with officers they considered to be role models who were not their mentors or unit officers. Protégés frequently had writing assignments to reflect on the experience and a final essay about what they hoped to incorporate into future relationships. In the comparison group, cadets attended six classroom sessions where leadership and leader development topics were discussed. Additionally, the comparison group had to complete essays

related to leader character. Cadets in the comparison group did not meet with mentors, conduct interviews, or write a final essay.

Participants in the mentorship program were more likely to develop leader efficacy. Higher levels of trust and negative feedback seeking were also associated with increases in leader efficacy over time. No evidence was found that the effects of trust was moderated by condition. However, the effect of negative feedback orientation was moderated by condition, such that there was a positive relationship between negative feedback seeking and change in leader efficacy in the mentoring condition, and no relationship in the control condition. Leader efficacy was positively related with performance ratings (although with a small effect size).

Annotator's Comment: The current study has a novel intervention design as far as mentoring is concerned with protégés being able to select their own mentor and protégés being required to seek out additional role models for an interview and feedback. Additionally, it is impressive that in an organization where leader development is so salient, a mentoring intervention demonstrated a positive effect on leader efficacy. However, it is not clear why the authors of this study did not test the proposed model, particularly the mediation effect of increased efficacy on performance. Also, no correlation effect size was reported between condition and performance scores.

16. Li, W. –D., Arvey, R. D., & Song, Z. (2011). The influence of general mental ability, self-esteem, and family socioeconomic status on leadership role occupancy and leader advancement: The moderating role of gender. *The Leadership Quarterly*, 22, 520-534.

This study was a true longitudinal study on a number of different factors in relation to leader role occupancy and leader advancement. General mental ability, self-esteem, family socioeconomic status (SES), and gender were all examined for their relationships with leader role occupancy and leader advancement. There were five repeated measures of leader role occupancy and a leader's scope of responsibility, which was measured as the number of people that an individual supervised.

The data from the study were from the National Longitudinal Survey of Youth in 1979, which was administered by the United States Department of Labor. Data were collected up until 2006. The final sample used for the analyses consisted of 1,747 working adults. General mental ability was measured using scores on the Armed Services Vocational Aptitude Battery (ASVAB) administered in 1980. Self-esteem was measured in 1987, and family socioeconomic status was measured by converting occupation codes into indices of occupational status.

General mental ability (GMA) did not have a significant effect on role occupancy or advancement; in fact the effect was in the opposite direction than was predicted. Self-esteem was positively related to leader role occupancy for men and women and was also positively related to supervisory scope (i.e., number of employees supervised) for women. Additional analyses pointed to a possible indirect relationship between GMA and leadership outcomes that was mediated by self-esteem, although the authors noted that further research would need to be done. Men tended to have a larger supervisory scope than women when they first moved into

leadership roles. However, the effects of gender were diminished when other variables were controlled for. Interestingly, family socioeconomic status negatively impacted the growth of supervisory scope for women but not for men.

Annotator's Comment: This article is a part of *The Leadership Quarterly's* Special Issue on longitudinal studies of leader development, which specifically highlighted studies that did not use data from the Fullerton Longitudinal Study and therefore represents a critical longitudinal study in the leadership literature. The study had a large sample and supports the findings from the FLS that intelligence is not a critical factor in the emergence of leaders or their advancement in terms of supervisory scope. Of particular interest is the unexpected finding that family SES differentially impacted women in the workplace in a negative way, as women from higher SES families were more likely to derail on the leadership track than women from lower SES families. This trend was not found in men.

17. Oliver, P. H., Gottfried, A. W., Guerin, D. W., Gottfried, A. E., Reichard, R. J., & Riggio, R. E. (2011). Adolescent family environmental antecedents to transformational leadership potential: A longitudinal mediational analysis. *The Leadership Quarterly*, 22, 535-544.

This study sought to examine how the childhood environment an individual grew up in related to leadership outcomes in adulthood. Furthermore, the authors proposed that an individual's self-concept mediated this relationship. This study used data from the Fullerton Longitudinal Study (FLS) to examine these factors.

The FLS is a longitudinal research initiative that began in 1979. Family socioeconomic status and quality of family life were measured at ages 12, 14, 16 and 17. Family SES was measured based on the occupation and education of the parents. Family functioning was measured using adolescent reports on the emotional and relational health of the family, with higher scores indicating a family was supportive and cohesive. Family atmosphere was measured using ratings from the mother regarding whether the family stimulated an interest in intellectual pursuits (e.g., social or cultural activities). Self-concept was measured when participants were 12, 14, and 16 years old. Finally, transformational leadership was measured in the 29th year of the study.

Overall, the study found support for the hypothesized model as the relationship between family functioning and transformational leadership behaviors was mediated by self-concept measured in adolescence. SES was not related to transformational leadership in the presence of the family functioning and family atmosphere measures. As such, when families had environments that were supportive and intellectually stimulating, their children were more likely to report engaging in transformational leadership behaviors as adults.

Annotator's Comment: This study examined the impact of family environment on transformational leadership in a multitude of ways and utilizing a longitudinal design. Family environment was rated by both adolescents and their parents, and the ratings of both family functioning and family atmosphere proved to be more important correlates of transformational leadership behaviors in adulthood relative to family SES. Additionally, the effect of positive

family environments on transformational leadership behaviors was mediated by a more positive self-concept in adolescence. This study and much of the FLS research demonstrated the importance of childhood and adolescence on leader development.

18. Reichard, R. J., Riggio, R. E., Guerin, D. W., Oliver, P. H., Gottfried, A. W., & Gottfried, A. E. (2011). A longitudinal analysis of relationships between adolescent personality and intelligence with adult leader emergence and transformational leadership. *The Leadership Quarterly*, 22, 471-481.

Personality traits have long been proposed as influential factors in leadership emergence and development. This study examined the relationship between the five-factor personality traits (conscientiousness, openness, neuroticism, extraversion, and agreeableness), leader emergence, and transformational leadership behaviors. The researchers in this study proposed specific hypotheses with respect to only conscientiousness and extraversion. Additionally, the study examined how intelligence was related to leadership outcomes, but only made a hypothesis that intelligence was positively related with emergence.

The data used in the analyses were part of the Fullerton Longitudinal Study. The personality traits and intelligence were measured during the 17th year of the study and the leadership outcomes were measured in the 29th year of the study. Leader emergence was measured in three different ways: a Likert-style measure assessing the degree to which participants had leadership duties at work, whether the participants held any of six work-related leadership positions (e.g., shift supervisor to company president), or whether participants held any nonwork related leadership positions (e.g., religious leader, sports organization). Additionally, participants completed a self-report survey on their transformational leadership behaviors at work.

For each leadership criterion (i.e., work-related leadership duties, work-related leadership positions, nonwork leadership positions, and transformational leadership behavior) the researchers performed a multiple regression, which included the five personality factors and intelligence. None of the predictors were significantly related to work-related leadership positions. Extraversion was the only predictor related to work-related leadership duties and with transformational leadership behaviors. Intelligence was not related to any of the work-related leadership outcomes but was related to nonwork related leadership positions.

Annotator's Comment: Relative to the other studies published in this special issue as a part of the Fullerton Longitudinal Study, what makes this study unique is the different types of leadership outcomes that were examined. Multiple studies in this special issue of longitudinal leader development research point to intelligence as not being relevant to leader emergence in the workplace. With respect to leader emergence, factors such as personality and motivation seem to be more influential. What is interesting is that more intelligent individuals were more likely to emerge as leaders in domains outside of work.

19. DeRue, D.S., Nahrgang, J.D., Hollenbeck, J.R., & Workman, K. (2012). A quasi-experimental study of after-event reviews and leadership development. *Journal of Applied Psychology, 97*, 997-1015.

While it is well accepted that leaders primarily learn and develop via experience, experience alone does not ensure that learning or development occurs. Developmental experiences may be ambiguous, often present a challenge, and require individuals to engage in some form of professional risk, factors that may distract from learning processes. The current study argues that introducing a layer of structure in the form of after-event reviews (AER) at the end of a developmental experience may aid in maximizing the value of the experience for learning.

The participants in the study were first-year MBA students of two different cohorts (control $N = 80$; experimental $N = 93$). The experimental cohort entered the program two years after the control cohort, so the two cohorts did not overlap in the program. Participants completed online surveys prior to entering the MBA program to gauge work experience and personality. Four developmental experiences that were common to each cohort were identified (e.g., 5-week leadership and teamwork simulation). Within two weeks of each experience all participants met with trained facilitators to discuss what they learned. In the experimental group, the facilitator followed an AER protocol developed by the U.S. Army that involves self-explanation, data verification, and feedback. Leader development was assessed by facilitators at two time points (after the first and last developmental experiences).

The AERs had a positive main effect on Time 2 (T2) leadership ratings over the initial measurement. Evidence was found for a few moderators of this relationship. Individuals that were higher in conscientiousness, openness, and emotional stability experienced more benefit from the AERs. Additionally, participants who had experienced greater developmental challenges in their careers benefitted more from the AERs relative to those who had experienced less developmental challenges.

Annotator's Comment: This paper makes a considerable contribution to the leader development literature using a quasi-experimental design with a control group. Additionally, the paper demonstrates that experience alone does not ensure that learning will occur. Efforts can be made on the part of organizations and managers to capitalize on the developmental experiences of their employees and make sense of what the employees learned from their experiences. Some important boundary conditions were also identified in the study in the form of prior experience and the traits of the individuals being developed.

20. Yeow, J., & Martin, R. (2013). The role of self-regulation in developing leaders: A longitudinal field experiment. *The Leadership Quarterly, 24*, 625-637.

This study summarized the effects of a longitudinal field experiment in which the intervention was focused on providing participants with effective self-regulatory strategies to help them develop into more effective leaders. All participants (both experimental and control group) received multiple multi-source feedback reports, however, only the experimental group received the intervention. The intervention was delivered by a qualified executive coach who

was not aware of the study hypotheses and not involved in the assessments of participants or team assignments. The coach helped leaders interpret and evaluate the feedback reports, provided examples of how to set goals around the development of a task-relevant competency, and informed participants of the importance of understanding leader development as an iterative and continuous process. The intervention was based on the self-regulation framework of Brown, Miller, and Lawendowski (1999).

Participants were second-year university students in the United Kingdom, enrolled in a Business Strategy Module. The students were placed in teams of four to five students with the purpose of producing, marketing, and selling an automobile in a simulated work environment. The experimental group had 15 leaders and 46 followers, and the control group had 25 leaders and 109 followers. The course lasted for 24 weeks and those in the intervention received the self-regulation coaching in Week 6. The pretest occurred during Week 4 of the course and there were two posttests (Week 14 and Week 20).

There were main effects of both condition and time on leader self-regulation, but there was also a time-by-condition interaction. Both groups of leaders improved their leader satisfaction, leader effectiveness, and extra-effort scores in the first posttest, but only leaders in the intervention continued to improve at the second posttest. The teams led by intervention leaders had better project profit, return on capital employed, and earnings per share, in addition to higher overall grades.

Annotator's Comment: The strength of this study is the utilization of two posttests to further demonstrate the development of leaders in the intervention. The samples were smaller than would be desired, although that is often the case in field experiments. This study indicates that organizations may be well served to invest time and effort into helping employees interpret, evaluate, and utilize feedback to their advantage. While all people engage in self-regulatory processes, not everyone is effective in engaging in these processes.

21. Carter, D.R., DeChurch, L.A., Braun, M.T., & Contractor, N.S. (2015). Social network approaches to leadership: An integrative conceptual review. *Journal of Applied Psychology, 100, 597-622.*

This article highlights the growing potential of social network approaches to answer important questions in the leadership literature and answer them in ways that is consistent with the conceptualization of leadership as being a relational process. In addition to contemporary views of leadership as being relational, leadership has also been defined as a process that is situated within specific contexts, that is patterned, and can be formal and/or informal. Social network approaches provide congruent theoretical foundations with these assumptions in addition to a complementary methodology for studying the contemporary conceptualization of leadership.

The article reviewed literature over the 15 years prior to its publication and sorted the literature into three focal areas: (a) *leadership in networks*, (b) *leadership as networks*, and (c) *leadership in and as networks*. The first area of research, *leadership in networks*, use social ties

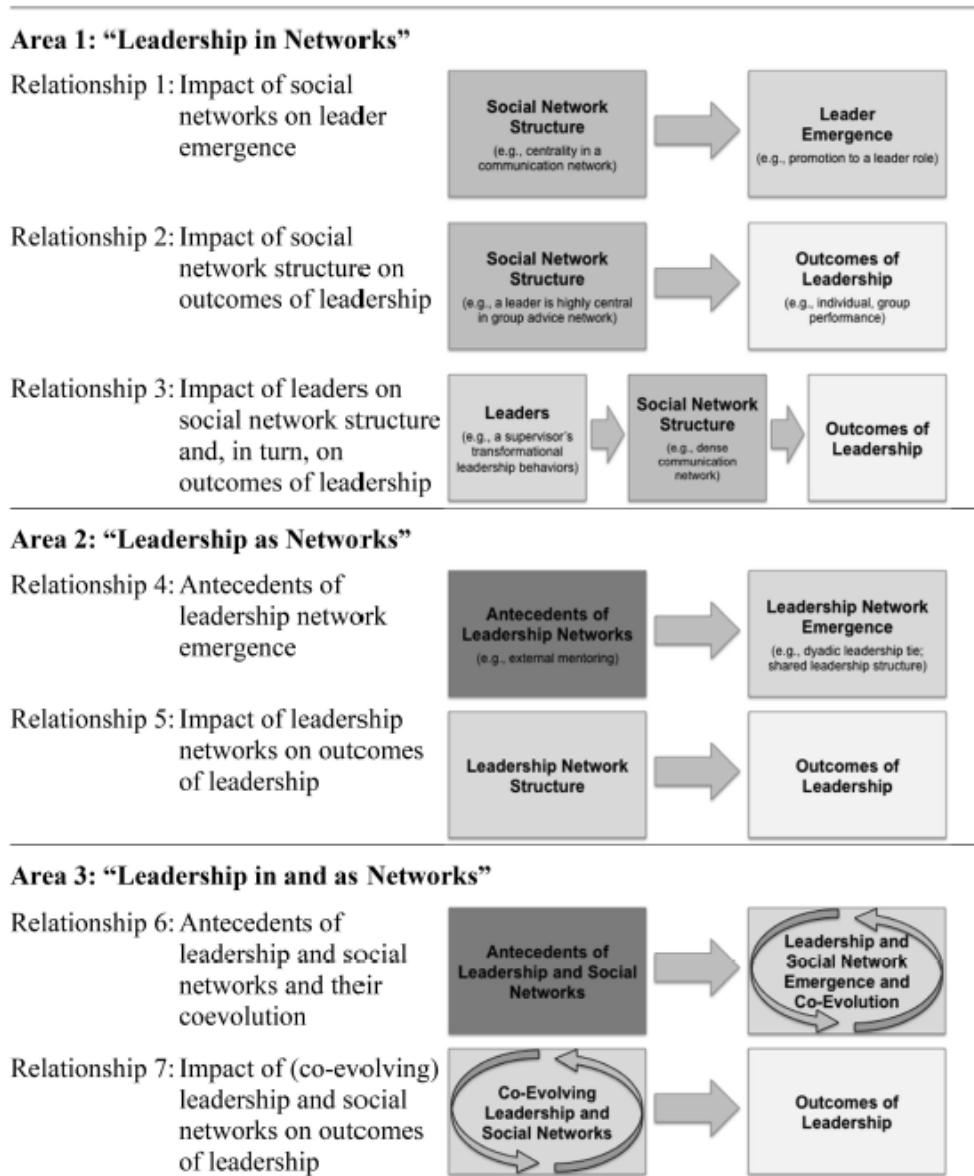


Figure 6

Organizing framework for research on leadership using a social network approach

Note. Figure 6 is from “Social network approaches to leadership: An integrative conceptual review” by D. R. Carter, L. A. DeChurch, M. T. Braun, and N. S. Contractor, 2015, *Journal of Applied Psychology*, 100, p. 602. Copyright 2015 by the American Psychological Association.

(e.g., communication) to explain leadership emergence and/or outcomes (e.g., effectiveness or performance). For example, the degree to which an individual is central to a group's communication may make the individual more likely to assume a leader role. In second area of research, *leadership as networks*, leadership ties are directly assessed, where one person attempts to provide leadership and another person accepts leadership. In the first area, social relation other than leadership are studied, whereas in the second area leadership is the relational variable. The third area, *leadership in and as networks*, utilizes network methodologies to explain emergence and effectiveness by capturing both social and leadership ties within a network. The studies reviewed are organized by seven general research questions asked in the literature, which fall into the three areas addressed above. The article closes with five agenda items for future research: (a) developing principles of leadership network emergence (i.e., who leads and who follows), (b) how do leadership structures affect individual, group, and organizational outcomes, (c) how do social and leadership networks coevolve, (d) integrating theories and levels of leadership to have a multitheoretical and multilevel approach to leadership, and (e) developing a computational social science of leadership.

Annotator's Comment: This article makes a strong case that an emerging research methodology in social network analysis presents a unique approach to the leadership literature. The leadership literature has acknowledged that leadership is a complex relational process between leaders and followers, and that this relational process is highly contextual. Also, the process can be patterned, and it involves both formal and informal roles. Therefore, there is a need for more methodologies that can account for the complexities. Collecting and analyzing relational data presents a unique challenge that is more complex than typical organizational research data collection. However, the growth and advances in digital technologies and new statistical techniques provide an avenue for tackling those complexities.

22. Kalish, Y., & Luria, G. (2016). Leadership emergence over time in short-lived groups: Integrating expectations states theory with temporal person-perception and self-serving bias. *Journal of Applied Psychology, 101*, 1474-1486.

This study was designed based on the notion that existing theories involving leader emergence did not adequately capture how perceptions of leadership evolved over short time frames. Specifically, the study examined how the attributes a collective used to judge who became a good leader evolved and shifted from attributes that were more observable (i.e., physical ability) to those that were more covert and emerged over time (i.e., cognitive ability). Additionally, this study examined whether there was a similarity bias in how people rated leader emergence in a group.

The study utilized a pilot sample to identify attributes associated with leadership. One attribute was identified as a noticeable attribute, physical ability, and one attribute was identified as a covert leadership attribute. The main study involved 87 male high school graduates around the age of 18 years, who took part in a two-day boot camp for an all-male military unit. The two independent variables, cognitive ability and physical ability, were examined in relation to the leadership perceptions that team members had of each individual. The research design is outlined in the table below.

Table 4*Research design*

Study		Pre group-formation	Day 1 (T1)	Day 2 (T2)	Post group-adjourning
Pilot	N = 60	Attributes of leaders in the assessment boot camp			
Main study	N = 87	IV: General cognitive ability C: Personality	IV: Physical ability DV: Leadership perceptions T1 C: Friendship perceptions T1	DV: Leadership perceptions T2 C: Friendship perceptions T2	C: Performance, motivation

Note. Table 4 is from “Leadership emergence over time in short-lived groups: Integrating expectations states theory with temporal person-perception and self-serving bias” by Y. Kalish and G. Luria, 2016, *Journal of Applied Psychology*, 101, p. 1478. Copyright 2016 by the American Psychological Association; DV = dependent variable; IV = independent variable; C = control

It was found during the first day that participants with higher levels of physical ability had a greater likelihood of being perceived as leaders. Participants with higher levels of cognitive ability were more likely to be perceived as leaders at the end of the boot camp. Participants with high levels of physical ability were more likely to perceive similarly able individuals as leaders at both time points. Interestingly, however, although participants with high levels of cognitive ability (covert) perceived other participants of similar ability as leaders, such perceptions occurred only later in the boot camp.

Annotator’s Comment: This article highlights a number of issues for consideration when measuring leader emergence in a group of people, primarily, that the relevant attributes people use to judge are not equally observable or salient. Additionally, this article demonstrates how perceptions of who makes a good leader are likely to be influenced by an individual’s similarity bias. In the context of social network analysis, this study serves as a good example of the methodology in practice.

23. Cullen-Lester, K.L., Maupin, C.K., & Carter, D.R. (2017). Incorporating social networks into leadership development: A conceptual model and evaluation of research and practice. *The Leadership Quarterly*, 28, 130-152.

This article makes the case similar to Carter et al. (2015, AB #21), that taking network perspective approach to leadership development fits with the evolving definitions of leadership that emphasize not just leaders, but their relationships with followers, studying dyadic interactions, and larger collectives. Whereas Carter et al. (2015) was purely a research focus, this article has a practitioner focus as well.

Three different approaches for network-enhancing leadership development are discussed: (a) development of individual’s social competence, (b) individuals shaping their networks, and (c) collectives cocreating networks. Through their literature review, they conclude that although

theory has incorporated many network themes, the research has been slow to incorporate a network perspective.

Leadership development practitioners were surveyed on the extent to which network themes were incorporated into their development practices. It was found that of the 282 practitioners surveyed, 96.81% had facilitated initiatives that targeted an individual’s personal development, 71.99% had facilitated initiatives focused on helping individuals improve the groups they lead, and 59.93% had facilitated initiatives that targeted an entire group’s effectiveness or performance. Only 34.49% of practitioners reported using network analytic techniques as a part of their development initiatives while close to 80% use the term network in their initiatives. The survey found strong evidence that leadership development practice has been making use of network development approaches grounded in theory, but that have not been empirically investigated.

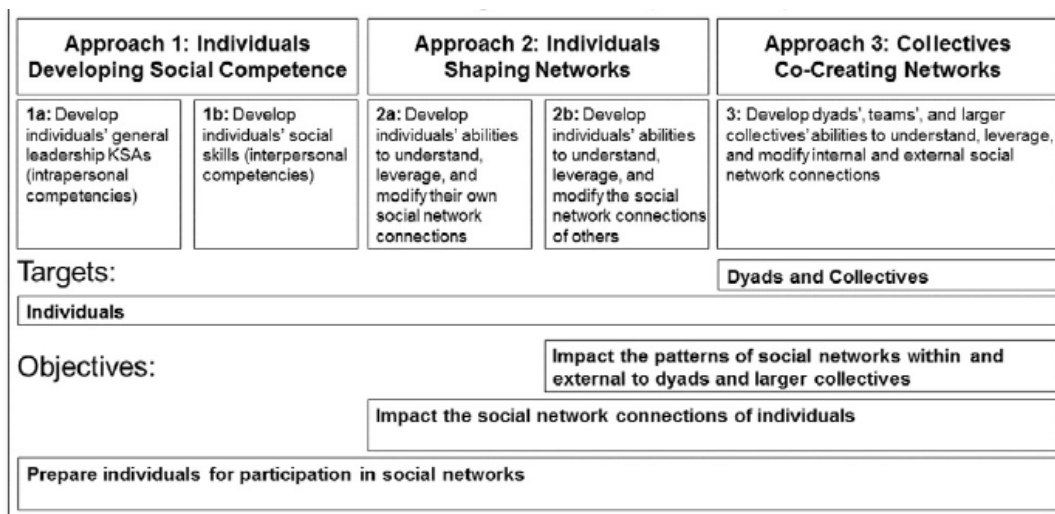


Figure 7

Network-enhancing leadership development

Note. Figure 7 is from “Incorporating social networks into leadership development: A conceptual model and evaluation of research and practice” by K. L. Cullen-Lester, C. K. Maupin, and D. R. Carter, 2017, *The Leadership Quarterly*, 28, p. 133. Copyright 2017 by Elsevier Inc.

Annotator’s Comment: In incorporating the network concept into the development literature, this article does a good job reflecting the different foci of development that are leader development (focused on an individual’s abilities) and leadership development (focused on a groups capabilities). Much of the literature reviewed are case-studies or practice-oriented research. Development initiatives that emphasize a network perspective would be particularly useful for leaders at the point in their careers where they are transitioning from positions where

their technical competence was highly valued, and into positions requiring a new set of skills that are social or relational in nature.

24. Lord, R.G., Day, D.V., Zaccaro, S.J., Avolio, B.J., & Eagly, A.H. (2017). Leadership in applied psychology: Three waves of theory and research. *Journal of Applied Psychology, 102*, 434-451.

This article summarizes leadership research published largely in the *Journal of Applied Psychology* with a focus on how leadership research developed after World War II. The review classifies the research literature within three waves: The First Wave (1948-1961) emphasized behavioral style approaches to leadership. The Second Wave (1969-1989) emphasized gender, social cognitive theories, situational approaches, and the beginning of transformational leadership. The Third Wave (1999-2007) emphasized meta-analysis, leader-member exchange, collective forms of leadership, trust, and transformational leadership.

The First Wave of leadership research was defined primarily by a focus on leadership behavior (as opposed to trait perspectives) and follower attitudes to leaders. During this wave of research, the Ohio State Research Group identified the primary leader behaviors to be Initiating Structure and Consideration. Behavioral observation of leaderless group discussion was emphasized as an assessment technique during this period that would heavily influence the multimethod approaches still used in assessment centers today. An early example of social network research is also cited from this wave (Browne, 1949, 1950, 1951).

The Second Wave of leadership research called into question the accuracy of behavioral ratings of leadership. Social-cognitive approaches postulated and found evidence that leadership perceptions were often heavily influenced by individuals' leadership prototypes rather than recalled behavior of a focal leader. Contingency and situational theories of leadership argued that there was no best leadership style and offered some moderators of leader behavioral style's relationships with outcomes, but these theories generally lacked consistent support.

The Third Wave of leadership research saw the proliferation of meta-analyses that reinvigorated research into leader personality and intelligence in relation to leader emergence and effectiveness. Relatively strong effects for both Consideration and Initiating Structure leader behaviors were found via meta-analysis as well. Transformational leadership theory gained influence in the field and was originally coined by a political scientist (Burns, 1978). Transformational leaders are believed to increase feelings of empowerment and dependence in followers, thereby creating a sense of mission and inspiring new ways of thinking. Leader-member exchange (LMX) theory became another theme of this wave, distinguishing itself by emphasizing the dyadic nature of leader-follower relationships. During this wave more and more women were entering the workforce, particularly within management, and the influence of cultural expectations of women in leadership roles became a critical area of study for the leadership literature. Lastly, leadership during this wave started to become conceptualized more and more as a team-level process, leading to an increase in research on collective forms of leadership.

The article ended with a look towards what the authors anticipated the future of leadership research to be. The authors noted that they expected future leadership research to be more multidisciplinary (e.g., developmental psychology, economics, sociology). The authors also noted that some of the biggest advances in leadership research were influenced by other fields (e.g., transformational leadership from political science). The proliferation of technology and distance between leaders and followers across generations, time zones, cultures, and markets have implications that have yet to be fully studied. Leadership as a collective phenomenon will continue to grow leading to an increased importance of social network theory and analysis. Sociopolitical, population, and climate changes will characterize the historical context within which leaders will develop during this next wave of leadership research.

Annotator's Comment: This review attempts to capture and organize several decades of leadership research primarily in the Journal of Applied Psychology. The review presents a history of the field that is easy to follow and links each period of research to previous periods to show how they tie together. The review does a particularly good job of noting when an early area of research is forgotten and then rediscovered (e.g., emphasis on the follower perspective pre-WWII and LMX theory). Perhaps the most interesting aspect of this article is what some of the preeminent leadership researchers anticipate in the coming years of leadership research and how those changes will influence the field (e.g., more multidisciplinary collaboration, sociopolitical and demographic trends). Though this article primarily focuses on research from the Journal of Applied Psychology, the article provides valuable context to anyone conducting leadership research.

25. Kwok, N., Hanig, S., Brown, D.J., & Shen, W. (2018). How leader role identity influences the process of leader emergence: A social network analysis. *The Leadership Quarterly*, 29, 648-662.

This study serves as one of the few empirical works on leader identity and its influence on leader development (see Day & Sin, 2011 and Miscenko et al., 2017, as the few exceptions). Leader role identity is defined in this study as, “the extent to which an individual views himself or herself as a leader (Hiller, 2005; Lord & Hall, 2005)” (p. 650). The more central this identity is to one’s self-concept, the more individuals are expected to be more behaviorally consistent with this identity (e.g., engage in influence and relational processes). Using social network analysis techniques this study examines how leader role identity is related to leader emergence, and whether this effect is mediated by network centrality (betweenness and indegree centrality).

Participants were 88 cadets in the Royal Canadian Air Cadet Program (58.2% male and average age was ~15 years). Participants were enrolled in a six-week summer training course to prepare them to be leaders in their local cadet programs. Leader role identity, individual differences, and demographics were collected at the beginning of training and the social network variables were measured by peers and trainer ratings after five weeks. Betweenness centrality was operationalized as the number of times a cadet was an intermediary link on the shortest path between two other cadets, whereas indegree centrality was operationalized as the number of other-reported ties to a cadet. Leader emergence was a composite score of trainer ratings of cadet leadership potential and promotability and peer ratings of group influence.

After conducting an instrumental-variable mediation analysis to account for endogeneity bias in the original regression model, it was found that the relationship between leader role identity and leader emergence was mediated by indegree centrality (number of people indicating that cadet was their friend). The effect was not mediated by information-brokerage.

Annotator's Comment: This study introduced a considerable amount of methodological and statistical rigor in the testing of their model (e.g., multisource and accounting for endogeneity bias). The study is a good example of incorporating social network analysis with leadership theory, specifically with theories of leader identity. The generalizability of the sample may be an issue given how young the participants were. The authors also note that leader role identity may itself be an outcome of leader development.

26. Alvesson, M., & Einola, K. (2019). Warning for excessive positivity: Authentic leadership and other traps in leadership studies. *The Leadership Quarterly*, 30, 383-395.

This paper challenges the foundation of positive leadership research, specifically with a focus towards authentic leadership. They argue that positive leadership research has generally lacked rigor and the ability to be critical of itself, and the growth of the field has been in large part due to the appeal of the do-gooder leader archetype to mass audiences rather than any foundation in meticulous research. The authors point to four main issues facing the authentic leadership literature as a whole:

- The term “authentic leadership” is more marketable than it is practical to study.
 - o Leadership is a role to influence others, whereas being authentic requires a devoted focus on the self. Prioritizing the authentication of oneself in order to better enact a role is an impossible task, unless you are *perfectly* suited for that role.
- The theory development around authentic leadership is tenuous.
 - o The elements comprising what makes an authentic leader do not form a logical whole: self-awareness, relational transparency, balanced processing, and an internalized moral perspective. This situation can make measurement of authentic leadership very difficult.
 - o Some definitions of authentic leadership include outcomes, confounding cause and effect.
- The principle of authenticity to self may not always be welcome in organizations.
 - o Authenticity may hinder goal attainment. People who are encouraged to act authentically may become inflexible and unchanging in their habits, therefore making it difficult for leaders to aligning people towards a goal.
 - o Encouraging authentic leadership may turn a leader's focus too much on the self, reinforcing narcissistic behavior.
- Authentic leadership theory is not alone in its flaws.
 - o Many other positive leadership theories (e.g., transformational, servant, ethical), emphasize an ideology of the leader as a hero, conflate cause and effect in their

construct definition, and focus on being uplifting and inspiring rather than helping leaders confront real life situations.

Rather than simply criticizing the positive leadership literature, the authors of this study also offered a way forward for leadership researchers. The authors encouraged leadership researchers to study how leaders struggle with contrasting ideals in enacting their roles, leader-follower relationships, the development of self in the career context, and to explore the boundary conditions of being authentic in the work place (e.g., when, why, how, and with what negative consequences).

Annotator's Comment: This article is important for any leadership researcher to read and reflect on. The article presents cogent arguments as to how newer leadership theories are flawed, while presenting sensible ways forward to add rigor to the leadership literature.

Building the Development Criteria

27. **Mumford, T. V., Campion, M. A., & Morgeson, F. P. (2007). The leadership skills strataplex: Leadership skill requirements across organizational levels. *The Leadership Quarterly*, 18, 154–166.**

Leadership skill requirements are typically different at varying organizational levels and are complex in nature, meaning there are a number of key parts. This paper uses the term *strataplex* to refer to the multilevel and complex nature of leadership skill requirements within organizations. Common conceptualizations of leadership skill requirements involve four skills:

(a) cognitive skills, (b) interpersonal skills, (c) business skills, and (d) strategic skills. At different leadership levels, these skills change in importance relative to previous leadership level.

Cognitive skills are considered foundational in leadership skill requirements and involve the collection, processing, and dissemination of information, communication skills, active learning, and critical thinking. Interpersonal skills are important as the role of leader involves interacting with and influencing others. As such, social perceptiveness, cooperation and coordination, and persuasiveness are critical skills. Business skills capture the context within which leaders in most organizations function. Business skills deal with the management of resources (e.g., material, personnel, and financial). Lastly, strategic skills involve understanding complexity, having a systems perception, being adept at problem identification and solution appraisal, and dealing with ambiguity. The authors proposed that leadership skill requirements would interact with organizational level such that certain skills would relate more strongly with organizational levels than others (i.e., Strategic > Business > Interpersonal > Cognitive).

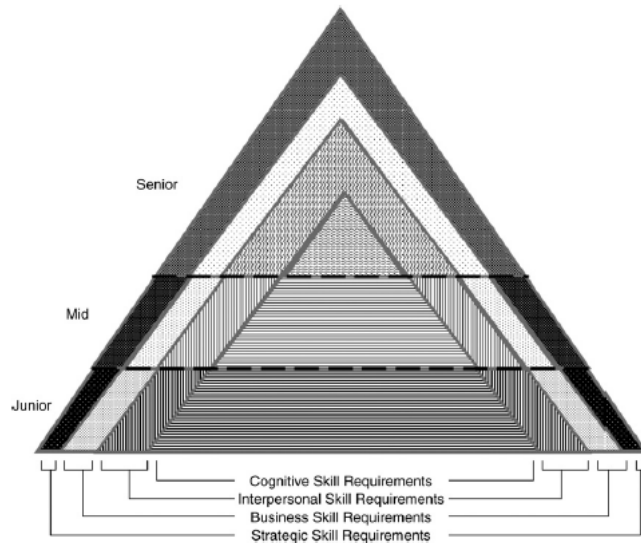


Figure 8

The leadership skill requirement strataplex

Note. Figure 8 is from “The leadership skills strataplex: Leadership skill requirements across organizational levels” by T. V. Mumford, M. A. Campion, and F. P. Morgeson, 2007, *The Leadership Quarterly*, 18, p. 156. Copyright 2007 by the Elsevier Inc.

Participants were 1,023 employees of an international agency in the U.S. government. The employees were sampled from three levels of the organization: junior level (1-5 years of experience), mid-level (6-20 years), and senior (21+ years). Leadership skill requirements were measured using the Occupational Information Network (O*NET) scales and employees rated the level of skills needed to perform their job on 7-point behaviorally anchored rating scales.

Support was demonstrated for the four factors of leadership skill requirements (cognitive, interpersonal, business, and strategic). Cognitive skill requirements received the highest ratings followed by interpersonal, business, and strategic skills. Overall, all four factors demonstrated positive relationships with organizational level. Strategic and business skills had the steepest slopes when examining the relationships with organizational level, followed by interpersonal and cognitive skill requirements.

Annotator’s Comment: This study is a good framework for researchers and practitioners alike to model how skills and/or competencies deemed relevant by an organization are more or less relevant at varying organizational levels. Conceptually, the model presented is easy to understand and communicate to nonacademics. The sample utilized in this study is potentially generalizable to other “up-or-out” personnel systems (e.g., military).

28. Day, D.V., Harrison, M.M., & Halpin, S.M. (2009b). Research needs and practical implications. In D.V. Day, M.M. Harrison, & S.M. Halpin (Eds.), *An integrative approach to leader development: Connecting adult development, identity, and expertise* (pp. 233-262). Routledge.

The development of leaders and their competencies is discussed in the context of U.S. Army leaders. Issues with competency models are discussed, primarily that they can be overly generic, too focused on the present, and they may be too abstract or conceptual to be of practical use. Additionally, it is argued that competency models ought to consider how a competency manifests itself at different hierarchical levels.

The main purpose of this chapter is to summarize the theoretical propositions made throughout the book and outline subsequent hypotheses to be addressed in the leader development literature. Tables 15.2 – 15.4 contain the 13 propositions and underlying hypotheses.

The chapter closes with a few important considerations that leader development researchers should keep in mind: the research should be concerned with whether leaders develop not whether performance improves, study designs should give special attention to the timing of measurement if a change is expected, the quality of the literature is dependent upon future investment in longitudinal research, and psychometrically sound measures of leader competencies are necessary for the progress of the literature.

Annotator's Comment: In addition to Chapter 4, this chapter is perhaps the most important chapter in this book. This chapter summarizes all of the propositions and subsequent testable hypotheses that could be explored to help advance research and theory into leadership development. Any research program interested in leader development would be well served by reading this chapter and the other chapters summarized in this annotated bibliography.

29. Dai, G., De Meuse, K. P., & Peterson, C. (2010). Impact of multi-source feedback on leadership competency development: A longitudinal field study. *Journal of Managerial Issues*, 22, 197-219.

This study sought to explore competency growth in a sample of managers from a financial services company in a leader development program that began in 1997. Specifically, the authors of this study wanted to investigate improvement on competencies selected for development after feedback compared to those competencies that were not selected. Additionally, developmental gains were tested to examine whether the gains were more than just regression to the mean, and if there was an effect of developmental difficulty of the competency on the development. Seventy-eight managers participated (55 managers participated in three 360-degree feedback administrations; 16 participated in four administrations). Each manager was rated by their supervisor, three peers, and three direct reports on 67 competencies that were representative of six factors. Raters rated the target on their proficiency on the competency and how critical the competency was to that person's job. The developmental difficulty of each competency was provided by the instrument publisher.

There was no significant effect of developmental difficulty on the *selection* of competency for development. Focal managers showed greater improvement on competencies selected for development compared to those that were not selected, and this improvement was greater than would be expected by regression to the mean. Managers had smaller improvements on competencies that were identified as competencies difficult to develop.

Annotator's Comment: This study is one of the few studies to examine leader competency growth over time. The authors made their best effort to account for the lack of a control or comparison group by accounting for regression to the mean, and for some participants they had multiple pretests or posttests. This article points out that competencies are not on an even playing field with respect to ease of development, as some competencies will be more difficult to develop. This differential development adds some complexity to the leader development literature, but an important factor to consider.

30. Braddy, P.W., Gooty, J., Fleenor, J.W., & Yammarino, F.J. (2014). Leader behaviors and career derailment potential: A multi-analytic method examination of rating source and self-other agreement. *The Leadership Quarterly*, 25, 373-390.

This article is particularly relevant to the leader development literature as it studies the behaviors that may be indicative of a stalled career trajectory. The study incorporates perspectives from focal leaders, as well as their direct reports, peers, and supervisors. Career development potential was conceptualized as behaviors that can stall a person's career when they were expected to advance in their organization. These behaviors include poor interpersonal relationships, inability to lead teams, failing to meet business goals, lacking flexibility, and a narrow functional orientation.

The study had the data of 966 leaders who took part in a five-day leadership development program in the US. The majority of the leaders were upper-middle management or executives. The study also had ratings from 4,262 direct reports, 3,968 peers, and 1,019 supervisors. All raters completed a feedback instrument that had measures of task- and relationship-oriented leader behaviors, as well as career derailment potential.

Both task- and relationship-oriented leader behaviors were negatively related to career derailment potential. Relationship-oriented behaviors were more influential. Self-ratings of task-oriented behaviors were positively related to career derailment potential from all 3 rating sources. Peer ratings of the focal leader's behaviors were generally the best predictor of leader derailment potential. Additionally, determining whose leader ratings were more influential also depended on who was rating derailment potential (e.g., for supervisor ratings of derailment, peer ratings of leaders mattered more than direct report, and direct report mattered more than self-ratings).

Higher levels of self-other agreement were generally related to lower levels of derailment potential. When there were discrepancies, derailment potential was higher for overestimators (those who rated themselves higher than their other raters on task- and relationship-oriented behaviors) than for underestimators.

Annotator's Comment: The biggest value in this paper is the knowledge that perspective matters in terms of assessing leaders and their development. For the talent management of leaders it is critical to take into account multiple perspectives. One potential shortcoming of this article is that raters were not assessing their perceptions that a focal leader's career was in threat of derailment, but rather problematic leader behaviors (e.g., "neglects necessary work to concentrate on high-profile work"). These assessments of problematic leader behaviors were used as indicators of derailment potential, although derailment potential was not measured directly.

31. Dragoni, L., Oh, I., Tesluk, P. E., Moore, O. A., VanKatwyk, P., & Hazucha, J. (2014a). Developing leaders' strategic thinking through global work experience: The moderating role of cultural distance. *Journal of Applied Psychology, 99*, 867-882.

This study examines a specific type of work experience, global work experience, in relation to the strategic thinking capacity of developing leaders. Four aspects of global work experience are examined: international assignment experience, multinational business operations experience, multicultural team experience, and experience in building relationships with culturally diverse others. Additionally, it is proposed that the cultural distance of the culture in which the experience occurred will moderate the relationship between global work experience and the strategic thinking competency.

Data were obtained from a cross-sectional archive from a large global consulting firm. The final sample consisted of 231 upper-level managers who had some level of global work experience. The strategic thinking competency was assessed via assessment center ratings of one behavioral interview and four simulated business exercises. The time spent in the four specific global work experiences was assessed and used the GLOBE project's (House et al., 2004) dimensions and operationalization for calculating cultural distance of the culture in which the experiences occurred.

Participants with more overall global work experience had better ratings on the strategic thinking competency. Specifically, those managers who had more experience in international assignments, managing a multinational business, and building multicultural relationships had higher ratings on the competency (but not those managers with more multicultural team experience). The exposure of leaders to more culturally distant contexts moderated all three of those relationships, such that the relationships were stronger for those managers who had more experience in more culturally distant contexts. Additional analyses found that, for the entire sample in the archival data ($N = 585$), those participants with global work experience had higher strategic thinking scores relative to the participants with no global work experience, even though both groups were identified as high potential leaders.

Annotator's Comment: Although the data used in the analyses are cross-sectional in nature, the multi-method assessment of the competency and the different aspects of global work experience measured contribute greatly to the value of this study. This article provides strong evidence that is more than just spending an amount of time working in another country, but the nature of the work being done and the cultural context in which work is being done that is related

to strategic thinking. Future research would benefit from a more longitudinal analysis, although the measurement of competencies would make a longitudinal study challenging.

32. Gentry, W.A., Clark, M.A., Young, S.F., Cullen, K.L., & Zimmerman, L. (2015). How displaying empathic concern may differentially predict career derailment potential for women and men leaders in Australia. *The Leadership Quarterly*, 26, 641-653.

The purpose of this study was to examine how enacted empathetic leader behaviors (empathic concern), relate to the career derailment potential of leaders as rated by their supervisors and peers. Career derailment potential was defined as when a leader who displayed initial promise is at risk of being fired, demoted, or has otherwise underwhelmed in relation to expectations. This study also examined gender as a moderator based on different expectations of men and women in leadership roles (i.e., agentic vs. communal).

There were 289 focal leaders in the sample who received ratings from direct reports, peers, and supervisors. Empathic concern was measured with direct report ratings of empathic concern. Career derailment potential was measured with supervisor and peer ratings of five behaviors that limit a person's career (e.g., difficulty changing or adapting, interpersonal problems).

Subordinate-rated empathic concern was negatively related to boss ratings of career derailment potential. This negative relationship was moderated by gender, such that the relationship was significant for women but not for men. Direct report ratings of empathic concern were also negatively related to peer ratings of career derailment potential and the effect was stronger for women leaders.

Annotator's Comment: The main strength in the study was the availability and use of multisource ratings of leader behavior. There was support for the notion that women benefit more for exhibiting stereotypically communal concern (empathic concern), more so than men do in relation to their career derailment potential. There was an issue with the operationalization of career derailment potential, despite strength of multisource data. The authors of this study did not actually measure anyone's perceptions of whether a manager's career was in peril. The authors essentially correlated positive leadership behavior with negative leadership behavior.

33. Friedrich, T.L., Griffith, J.A., & Mumford, M.D. (2016). Collective leadership behaviors: Evaluating the leader, team network, and problem situation characteristics that influence their use. *The Leadership Quarterly*, 27, 312-333.

This study examined how leader individual differences, team network characteristics, task domain, and problem focus, influence the use of three types of collective leadership behaviors – communication, network development, and leader-team exchange. Collective leadership was defined as, “a dynamic process in which a defined leader, or set of leaders, selectively utilizes the skills and expertise within a network as the need arises” (p. 313).

The sample consisted of 153 undergraduate students in a university in the United States. Participants were recruited to participate in a leader problem-solving study. Participants

completed individual differences measures (i.e., intelligence, personality, biodata, prior experience in organizations, and leadership experience). Participants then participated in two separate low-fidelity leadership simulations. One was focused on an organizational change scenario and one was focused on innovation. In each scenario they had to respond to two issues, one that was task-focused and one that was person-focused. Participants assume the role of a leader in each scenario (e.g., vice president, director). The manipulations differed in terms of the size of the network provided in the scenario, the density with which networks were connected, and the embeddedness of members within a network. Trained raters rated the collective leadership behaviors described in the participants plan in response to each scenario.

Participant intelligence was related to the selection of network development and leader-team exchange behaviors. Prior leadership experience was negatively related to communication. Agreeableness was positively related with communication. Communication behaviors were selected more frequently in smaller, less connected, and less embedded teams, and was selected more for strategic change scenarios than for innovation. Network development was used more in strategic change and relationship-focused problems than in innovation scenarios or task-focused problems. Leader-team exchange was used more in innovation scenarios and task-focused problems than in the strategic change scenario or relationship-focused problem.

Annotator's Comment: This study is one of the few empirical studies attempting to capture collective leadership. The individual differences of intelligence, prior leader experience, and agreeableness proved to influence collective leadership behaviors. Notably, personality did not have much of an effect on the selection of behaviors with the exception of agreeableness and communication. Due to the low fidelity simulation, this study may not be anything more than a proof of concept paper that supported the theoretical framework proposed by Friedrich et al. (2009). Importantly, the study provides good evidence that leader characteristics, team, and task characteristics are all likely to influence collective leadership behaviors put in motion.

34. Mumford, M.D., Todd, E.M., Higgs, C., & McIntosh, T. (2017). Cognitive skills and leadership performance: The nine critical skills. *The Leadership Quarterly*, 28, 24-39.

This article is a conceptual paper and research summary that focuses on the leader as a problem-solver, as the authors feel like this model of leader performance has not received the same degree of attention in the literature as other models (i.e., leader as a teacher, leader as a politician, and leader as a warrior). The central focus of this model of leadership performance is leader knowledge and leader skills in applying their knowledge.

The article discusses components of leader knowledge that are relevant, mainly expertise, case-based knowledge, and mental models. The authors argue that having and possessing knowledge by itself is not enough and leaders must also possess skills that aid them in applying that knowledge to effectively problem solve. The authors propose an interconnected model of nine skills that contribute to leader performance as a problem solver: (a) problem definition, (b) cause and goal analysis, (c) constraint analysis, (d) planning, (e) forecasting, (f) creative thinking, (g) idea evaluation, (h) wisdom, and (i) sensemaking. The relevant research for each skill is then presented, though the authors acknowledge that there is better empirical evidence for

the importance of some skills (i.e., cause and goal analysis, planning, forecasting, creative thinking), relative to others (i.e., constraint analysis, idea evaluation, wisdom, sensemaking).

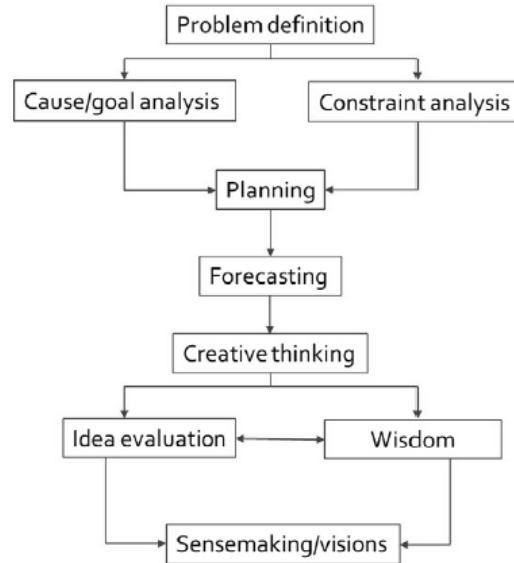


Fig. 1. Hypothesized relationships.

Figure 9

Hypothesized relationships for the nine critical leadership skills

Note. Figure 9 from “Cognitive skills and leadership performance: The nine critical skills” by M. D. Mumford, E. M. Todd, C. Higgs, and T. McIntosh, 2017, *The Leadership Quarterly*, 28, p. 28. Copyright 2017 by the Elsevier Inc.

Annotator’s Comment: This article synthesizes research in a unique area of the leader performance literature, as the problem-solving capacity of leaders has not been given as much research attention as some other areas (e.g., transformational leadership). This conceptual article gives researchers a good framework for what complex cognitive skills should be considered in assessing leader potential beyond general mental ability. The article acknowledges, but does not necessarily fully incorporate, their model with the inherent social nature of the problems leaders are supposed to be solving. Construct definitions of the nine skills are not readily apparent.

Developmental Experiences and Individual Readiness

- 35. Mumford, M.D., Marks, M. A., Connelly, M. S., Zaccaro, S. J., & Reiter-Palmon, R. (2000a). Development of leadership skills: Experience and timing. *The Leadership Quarterly*, 11, 87–114.**

This study compared the leadership skills of three different groups of leaders in the United States Army, in order to get a better idea of how skills are acquired over the course of people's careers. The central assumption of the study was that skills are developed through learning processes as an individual interacts with their environment. The goal of the study was to demonstrate that knowledge and skills related to leadership increase with experience, and that certain aspects of assignments and trainings are related to skill levels at different phases of development.

The data obtained were part of a larger study on Army officer leadership detailed in Zaccaro et al. (2000). The sample consisted of army officers ranging from second lieutenants to colonels and ranging in age from 21 to 58 years. The officers were divided into three groups: 1,160 junior leaders (second lieutenants, first lieutenants, and junior captains), 410 midlevel leaders (senior captains and majors with company command experience), and 220 senior leaders (lieutenant colonels and colonels with battalion command experience).

There were changes in the following leadership skills between both junior and midlevel leaders and midlevel to senior leaders: leadership expertise, solution construction, creative thinking, and social judgment. There was no difference between junior and midlevel leaders with respect to complex problem solving, whereas there was a difference between midlevel leaders and senior leaders on this skill, suggesting it does not develop until later in a career. When examining how different aspects of assignments related to group differences the most notable aspects that were related to increase in leadership skills between groups were problems with multiple components, long-term planning, novel and ill-defined problems, diverse experiences, autonomy, and boundary spanning assignments. The career development factors that were related to skill increases were developmental orientation, basic technical training, and advanced professional training.

Annotator's Comment: This study serves as an important descriptive study of leadership skills in the United States Army. It serves as a good guide and emphasizes that future research, which should be more rigorous in its methodology, should be focused in terms of leader skill development. Ultimately, the data used were cross-sectional in nature, and a longitudinal, cohort based design would be better able to account for issues of generalizability and validity. Nevertheless, the study reinforces the idea that leadership experience and skills increase across grade levels, different aspects of leadership are more relevant at different levels of leadership, and the more senior a leadership position is the higher degree of skill that is required.

- 36. Mumford, M.D., Zaccaro, S. J., Johnson, J. F., Diana, M., Gilbert, J. A., & Threlfall, K. (2000b). Patterns of leader characteristics: Implications for performance and development. *The Leadership Quarterly*, 11, 115–133.**

Using the same sample used in another study (Mumford et al., 2000a), this study sought to examine the prevalence of certain types of leaders at different levels of an organization. The study also hoped to draw conclusions regarding homogeneity (one-best-way) or selective diversity models of leadership are more apt for describing leader fit in organizations.

The sample was divided into two subsamples: 821 junior leaders (second lieutenants to junior captains) and 426 senior leaders (senior captains to colonels). The leadership types were created by conducting a cluster analysis on various motivational attributes, personality characteristics, and ability (i.e., achievement and dominance motives, commitment to social systems, openness, MBTI, verbal reasoning, & writing skill). Three types of leaders were more or equivalently prevalent when examining junior and senior leaders: motivated communicators, social adaptors, and thoughtful innovators. Very few limited defensives, disengaged introverts, and struggling misfits were identified in the senior officer sample, despite each group having a representation at or above 10% in the junior officer group.

Table 5

Summary of type characteristics

<i>Type Label^a</i>	<i>Pattern of Scores on Ability, Personality, and Motivation Variables</i>
Concrete Achievers	
High	Achievement, Planning
Low	Intuition, Perception, Openness, Verbal Reasoning
Motivated Communicators	
High	Extroversion, Responsibility, Achievement, Dominance, Verbal Reasoning, Generation, Revision
Low	Intuition, Feeling, Perception
Limited Defensives	
High	Introversion, Sensing, Thinking, Judging
Low	Intuition, Verbal Reasoning, Planning, Revision
Disengaged Introverts	
High	Introversion, Intuition, Perception, Planning, Generation
Low	Responsibility, Achievement, Dominance, Extroversion
Social Adaptors	
High	Extroversion, Feeling, Perception, Openness, Verbal Reasoning
Low	Thinking, Judging, Sensing
Struggling Misfits	
High	None
Low	Introversion, Intuition, Thinking, Judging, Openness, Verbal Reasoning, Planning, Generation, Revision
Thoughtful Innovators	
High	Introversion, Intuition, Thinking, Achievement, Dominance, Openness, Verbal Reasoning, Planning, Generation, Revision
Low	Sensing, Feeling

Note. Table 5 is from “Patterns of leader characteristics: Implications for performance and development” by M. D. Mumford, S. J. Zaccaro, J. F. Johnson, M. Diana, J. A. Gilbert, and K. Threlfall, 2000, *The Leadership Quarterly*, 11, p. 123. Copyright 2000 by the Elsevier Inc; ^aHigh and Low indicates mean differences in excess of half of a standard deviation from junior officers as a group.

The decline in prevalence of limited defensives, disengaged introverts, and struggling misfits appeared to be associated with below average increases in problem-solving, solution construction, and social judgment skills. Those groups that increased in prevalence (motivated

communicators & thoughtful innovators) exhibited skill increases in moving skill levels on problem-solving, solution construction, and social judgment. Where the thoughtful innovators differed from motivated communicators was that they continued to increase in skill levels moving from mid-level to more senior positions.

Annotator's Comment: Similar to Mumford, Marks, et al. (2000a), this study is a valuable descriptive study of U.S. Army personnel. The utilization of ability, personality, and motivational constructs to identify types of Army leaders is also quite useful and each construct is important to consider in any study of leader development. Similarly, the study provides a useful framework and benchmark for what future leadership development research might consider, particularly with respect to how the spectrum of individual differences relate to longevity and development within the U.S. Army. Ultimately, however, this study suffers from some of the same generalizability and validity issues given the cross-sectional nature of the study design.

37. Avolio, B.J., & Hannah, S.T. (2008). Developmental readiness: Accelerating leader development. *Consulting Psychology Journal: Practice and Research*, 60, 331-347.

This article is an early attempt to organize a framework for how to model and study developmental readiness, defined as, 'both the ability and motivation to attend to, make meaning of, and appropriate new knowledge into one's long-term memory structures' (p. 336, originally from Hannah & Lester, 2009, p. 37). An important point this article makes in relation to the leader development literature is that 30% of the variance in leader emergence is accounted for by heritability, indicating that leaders are largely shaped by their experience. Despite this promising finding, little is known as to what can help accelerate leader growth. This article proposes that an individual's developmental readiness should relate to how quickly they develop.

Five individual attributes are proposed as indicators of developmental readiness: goal orientation, developmental efficacy, self-awareness, leader complexity, and metacognitive ability. After defining each attribute, developmental implications are addressed at how to best leverage those to stimulate development. Goal orientation is conceptualized as a stable individual difference with dimensions that include learning goal orientation and performance goal orientation. Individuals high in learning goal orientation see themselves as continuous and incremental learners, and are more likely to interpret feedback as developmental and helping them reach their potential. Individuals high in performance goal orientation view their skills and abilities as more fixed, and view feedback as diagnostic of the self.

Developmental efficacy represents a person's level of confidence that they can improve in an ability or skill to enact a role within a given context. Developmental efficacy is more state-like and context dependent than goal orientation. Self-awareness refers to an individual's understanding of who they are, their capabilities, and motivations in responding to situations. Self-awareness requires some form of reflection, but the type of reflection (adaptive vs. maladaptive) is likely to influence a person's ability to learn from developmental experience.

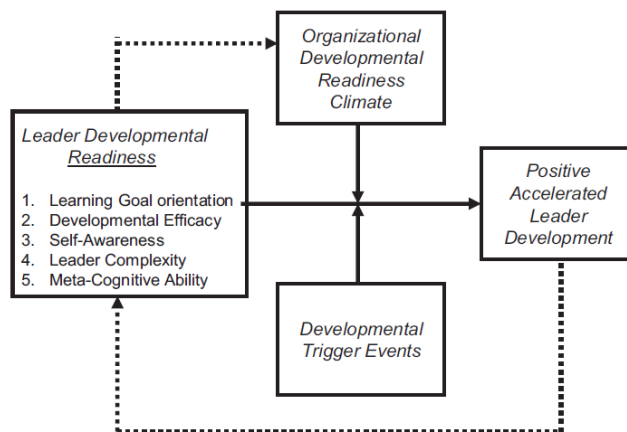


Figure 10

Leader and organizational developmental readiness

Note. Figure 10 is from “Developmental readiness: Accelerating leader development” by B. J. Avolio and S. T. Hannah, 2008, *Consulting Psychology Journal: Practice and Research*, 60, p. 332. Copyright 2008 by the American Psychological Association.

Leader complexity is associated with the level of complexity a leader has experienced and encoded into the self-concept through their life. It is expected that more complex leaders will have more internal associations to aid in the processing and interpreting of novel experiences. Complexity can consist of content (type of attributes) and structure (inclusion of attributes across roles). It is not just prior experience that an individual has had, but the complexity with which they have encoded those experiences. Lastly, metacognitive ability, which refers to an awareness of one’s cognitive processes, strengths and weaknesses, and self-regulation. Individuals with higher metacognitive ability will be able to interpret and process developmental experiences.

The article provides measures of these constructs, helpful for both practitioners and researchers. The article finishes with a discussion of what constitutes developmental readiness of an organization. The authors of the article propose that organizations that are strengths-based and have a positive developmental climate at all levels of leadership are in the best position to develop leaders. This article provides a useful framework and measures in the appendix to investigate developmental readiness in leaders.

Annotator’s Comment: This article provides a very useful starting point for researchers to begin to conceptualize and examine individual developmental readiness. The focus of the article is on identifying which individual differences may be related to a person’s ability to take advantage of developmental opportunities and ways in which organizations could help stimulate

that process in individuals. There seems to be some conceptual overlap of the individual difference constructs (e.g., self-awareness and metacognitive ability), and some are not clearly defined in the text.

38. Day, D.V., Harrison, M.M., & Halpin, S.M. (2009c). Leader development through learning from experience. In D.V. Day, M.M. Harrison, & S.M. Halpin (Eds.), *An integrative approach to leader development: Connecting adult development, identity, and expertise* (pp. 133-158). Routledge.

This chapter discusses in depth how experience is supposed to shape the development of leaders. The chapter incorporates both applied psychology and adult education literature in its discussion. A common theme in evaluating the impact of experience on development is that it is not necessarily the amount of experience that influences development, but more so the contextual and qualitative aspects of experience that have more of an impact on development. Work done by the Center for Creative Leadership (CCL) plays a central role in the initial discussion of how experience shapes development. According to CCL's model, development is a function of leaders being exposed to a variety of developmental experiences that incorporate assessment, challenge, and support AND the ability of leaders to learn and take advantage of developmental experiences. One of the more empirical studies cited is a finding that action-event reviews that were focused on both successful and failed experience resulted in improved performance compared to reviews that only focused on failed experiences.

The next section of the chapter addresses different ways to operationalize experience in studies of leader development. Many of these approaches attempt to quantify experience. For example, CCL developed the Developmental Challenge Profile (DCP) to assess the developmental value of work-related experiences, although the DCP has a number of limitations. Applied psychology has approached experience by attempting to measure the quantitative (e.g., length of time working in a job or number of times task was performed) and qualitative (e.g., variety, challenge, and complexity) aspects of experience. The interaction of the two, particularly time with any of the qualitative aspects, is of increasing interest in the development literature. However, this is an area that has not been well explored.

The rest of the chapter is devoted to an in-depth discussion of learning in adults. Andragogy (teaching adults) is differentiated from pedagogy (teaching children), and different assumptions are made in regard to the students including their motivation, the role of the teachers, and an individual's readiness to learn. Different theories (e.g., experiential learning, vicarious learning), contexts (e.g., organization), and difficulties in learning from experience are also discussed.

Table 6

Summary of assumptions about learning pedagogy and androgogy

Assumption	Pedagogy	Andragogy
1. The need to know:	Only what the teacher says they need	Why the need to learn something is critical
2. Learner's self-concept:	Dependent on the teacher	Self-directed and responsible
3. Role of learners' experiences:	Of little value compared to the teacher	Rich resource for learning
4. Readiness to learn:	What is needed to pass	What is needed in real-life situations
5. Orientation to learning:	Acquiring subject-matter content	Task-centered and problem-centered
6. Motivation:	Through external motivators	More internally motivated

Note. Table 6 is from *An integrative approach to leader development: Connecting adult development, identity, and expertise*, by D. V. Day, M. M. Harrison, and S. M. Halpin, 2009, p. 141. Routledge. Copyright 2009 by Taylor & Francis Group, LLC; Adapted from Knowles et al., 1998.

Annotator's Comment: This chapter represents one of the more critical sections of the book to read, as it highlights many of the overall themes from the book. That is, theories of leader development ought to be well-informed of, and integrate, theories and knowledge of adult development. This chapter serves as a useful source for considering the complexity of how experience shapes leader development, particularly considering how experience represents much more than how long one has been with an organization or worked in the same job.

39. Day, D.V., Harrison, M.M., & Halpin, S.M. (2009d). Adult development processes in leader development. In D.V. Day, M.M. Harrison, & S.M. Halpin (Eds.), *An integrative approach to leader development: Connecting adult development, identity, and expertise* (pp. 213-229). Routledge.

Consistent with the theme of the book, this chapter begins by making another case for why any theory of leader development must incorporate knowledge from the adult development literature. For example, it is well understood in adult development that certain faculties decline at a certain age (e.g., information processing), whereas other faculties are still able to develop (e.g., crystallized intelligence). Additionally, the self-regulatory behaviors adults engage in order to manage their physical and psychological health become increasingly important as the individual's age.

Next, the selection-optimization-compensation model of adult development and aging is proposed and discussed as a useful framework in the leader development literature. These processes are theorized to contribute to successful development as people age. Selection refers to the setting of goals and defining desired outcomes. Optimization refers to the acquisition and

management of goal-relevant resources. Compensation refers to responding to the counteraction of losses.

Table 7

Selection, optimization, compensation (SOC) component processes with typical instances

Selection (goals/preferences)	Optimization (goal-relevant means)	Compensation (means for counteracting loss)
<ul style="list-style-type: none"> • Elective Selection • Specification of goals • Goal system (hierarchy) • Contextualization of goals • Goal commitment 	<ul style="list-style-type: none"> • Attentional focus • Seizing right moment • Persistence • Acquiring new skills/resources • Practice of skills 	<ul style="list-style-type: none"> • Substitution of means • Use of external aids/help • Activation of new skills/resources
<ul style="list-style-type: none"> • Resource allocation 	<ul style="list-style-type: none"> • Modeling successful others 	<ul style="list-style-type: none"> • Change in resource allocation
<ul style="list-style-type: none"> • Loss-based selection • Focus on most important goals • Reconstructing a goal hierarchy • Adaptation of new standards • Search for new goals 	<ul style="list-style-type: none"> • Modeling successful others who compensate 	

Note. Table 7 is from *An integrative approach to leader development: Connecting adult development, identity, and expertise*, by D. V. Day, M. M. Harrison, and S. M. Halpin, 2009, p. 217. Routledge. Copyright 2009 by Taylor & Francis Group, LLC; Adapted from Freund & Baltes, 2002.

The chapter acknowledges the complexity of leader development and conceptualizes development as a *web*, with a series of interconnected strands of events, instead of a *ladder*, in which a person would continuously develop upward. This conceptualization makes different, yet necessary assumptions about development, mainly that it is a process of gains and losses and therefore is likely a nonlinear phenomenon. The moral reasoning, reflective judgment, and wisdom of leaders are proposed as key features to be developed in this process.

Annotator’s Comment: This chapter challenges some myths about leader development, primarily that development is a positive and linear process. By conceptualizing leader development as a web instead of a ladder, this complexity is more effectively communicated, although the operationalization is made more difficult. The incorporation of the SOC processes into a leader development framework provides a useful way forward for research in building theory in the context of adult development.

40. DeRue, D.S., & Wellman, N. (2009). Developing leaders via experience: The role of developmental challenge, learning orientation, and feedback availability. *Journal of Applied Psychology, 94*, 859-875.

This study examines how challenging work experiences contribute to leader development and how learning orientation and availability of feedback moderate that relationship. Whereas experience-based learning theories assume a linear relationship between how challenging an experience is and the developmental value of the experience, adult learning theories argue that experiences that are too challenging may have deleterious effects on development. The authors hypothesize that there will be a curvilinear relationship between developmental challenge and leadership skill development, in which developmental challenge will have a positive impact on development up to a point and then exhibit diminishing returns. Two moderators of this relationship are also proposed, learning orientation and feedback availability, such that the pattern of diminishing returns will be weaker when individuals are higher on learning orientation and when they have more feedback available to them.

The final sample consisted of 60 leaders who held middle- or senior-level positions and provided information relating to 225 different work experiences. Focal leaders rated learning orientation, feedback availability, and developmental challenge. Supervisors provided ratings of leadership skill development.

Support was found for the hypothesis that there would be a significant curvilinear relationship between developmental challenge and leadership skill development (although there was still a significant linear relationship). There was no support for learning orientation as a moderator of the curvilinear relationship (not significant effect size, although the pattern of the moderation was present). There was support for the hypothesis that the availability of feedback would moderate the curvilinear relationship, as participants who reported more access to feedback did not experience the same diminishing returns in their skill development. Exploratory analyses found that the relationship between developmental challenge and leadership skill development could be moderated by the type of skill category. There was no significant linear or curvilinear relationship for cognitive leadership skills. The curvilinear relationships for interpersonal and business leadership skills were significant. The positive linear relationship was significant for strategic leadership skill development, but the curvilinear term did not reach significance.

Annotator's Comment: This was a very ambitious study with regard to the study design as it involved multiple surveys and interviews of research subjects and their supervisors. Some of the findings reported may have been reported as "significant" had they been able to have a larger sample, although the burden of multiple surveys and interviews of research subjects and their supervisors likely made that a challenge.

41. Orvis, K.A., & Ratwani, K.L. (2010). Leader self-development: A contemporary context for leader development evaluation. *The Leadership Quarterly, 21*, 657-674.

More than ever, organizations are looking for ways to help their employees develop that are less costly than typical organization-directed training and development programs. Organizations have begun to emphasize the importance of self-development, giving leaders more flexibility and encouraging them to take more ownership over their development. The article defines leader self-development as, “the voluntary development activities that leaders deliberately complete for the purpose of enhancing their own leadership capacities and performance” (p. 659). The issue that has always plagued development research is to find the best way to assess how developmental activities relate to improvement. Formative evaluations seek to examine why programs work or do not work, whereas summative evaluations only assess whether or not a developmental program worked. This study aimed to investigate formative evaluation of developmental activities as opposed to summative evaluations.

The authors propose five key aspects of leader self-developmental activities that should influence improvement based on a review of instructional design, adult learning and education, and training and development literatures: content relevancy, learner engagement, challenge, structure, and experiential variety. Notably, the first four (i.e., content relevancy, learner engagement, challenge, and structure), are expected to be relevant to most developmental settings, whereas the authors expect that experiential variety to be specific to *leader* self-development.

Table 8

Definitions of the instructional design attributes indicative of effective leader self-development

Instructional design attribute	Definition
Content relevancy	<i>Content relevancy</i> is the degree to which the content of a self-development activity directly addresses the individual's leadership-specific knowledge/skills in need of development.
Learner engagement	
Two components	Two components
a) Practice	<i>Practice</i> is the degree to which a self-development activity requires the leader to produce responses, cognitive or physical, using the instructional content of the activity rather than merely watching, listening, or reading the content.
b) Progress evaluation information	<i>Progress evaluation information</i> is the degree to which a self-development activity provides for the obtainment of direct and specific information about one's current mastery level and progress with respect to learning and development efforts.
Challenge	<i>Challenge</i> is the degree to which a self-development activity represents a personally demanding situation requiring a considerable amount of cognitive or physical effort in order to develop one's knowledge and/or skill levels.
Structure	<i>Structure</i> is the degree to which a self-development activity determines the pacing, and hierarchical structure and sequencing of the instructional material for the leader.
Experiential variety	<i>Experiential variety</i> is the degree to which the collection of self-development activities completed by the leader involves activities that are qualitatively different from one another versus activities that are qualitatively the same.

Note. Table 8 is from “Leader self-development: A contemporary context for leader development evaluation” by K. A. Orvis and K. L. Ratwani, 2010, *The Leadership Quarterly*, 21, p. 660. Copyright 2010 by the Elsevier Inc.

The article summarizes research that measures and evaluates the effectiveness of these aspects of leader self-development activities. Leaders are asked to describe the most important self-development activity they have engaged in within a given time period (e.g., within the last month), and based on those descriptions trained raters code the descriptions for their content

relevancy, learner engagement, challenge, and structure. Leaders also list the number of activities they engaged in and the raters provide ratings of experiential variety. In the research summarized (Orvis, 2007; Langkamer, 2008), the aspects of content relevancy, challenge, structure, and experiential variety were highlighted as influential. Additionally, the attributes of the activities demonstrated interaction effects. Specifically, task performance showed greatest improvement for leaders whose self-development was challenging and content relevant (Orvis, 2007), and team sales performance was highest for leaders whose self-development activities were challenging and provided greater experiential variety (Langkamer, 2008).

Annotator's Comment: This article points out that the evaluation of developmental activities oftentimes does not adequately capture specifically why an intervention or activity was effective. In providing a taxonomy of self-development activities, researchers and practitioners can attempt to assess how attributes of an activity relate to outcomes. The article provides a sample questionnaire in an appendix for future research to consider. The authors make an important point in the conclusion that despite the emphasis of self-development activities, organizations should continue to devote considerable attention and resources towards self-development efforts as it is likely to contribute to a culture of learning within the organization.

42. Hannah, S.T., & Avolio, B.J. (2010). Ready or not: How do we accelerate the developmental readiness of leaders. *Journal of Organizational Behavior*, 31, 1181-1187.

This article proposes developmental readiness as an individual difference that influences the degree to which people develop as a leader, based on the findings of Avolio et al. (2009, AB #9), that a significant amount of variance is left unaccounted for in assessing the impact of interventions. The concept of leader developmental readiness (DR) is defined in this article as, “the ability and motivation to attend to, make meaning of, and appropriate new leader KSAAs (knowledge, skills, abilities, and attributes) into knowledge structures along with concomitant changes in identity to employ those KSAAs” (p. 1182).

A key implication of the above definition is that developmental readiness is comprised of two parts: motivation to develop and ability to develop. The constructs relevant to motivation to develop are interests and goals, goal orientation, and developmental efficacy. The constructs relevant to ability to develop are self-awareness and self-concept clarity, leader complexity, and metacognitive ability. Of these constructs, goal orientation is thought to be the least malleable, whereas the other constructs are thought to be more state-like. Some initial empirical evidence from longitudinal data collected in two samples of military cadets found that learning goal orientation, metacognitive ability, and self-concept clarity moderated levels of development in a few leader outcomes (effect sizes ranged from 0.20 to 0.47).

Annotator's Comment: Ultimately this article proposes that developmental initiatives should pay particular attention to the developmental readiness of their employees from the outset of training and development in order to get the greatest return on development investment (RODI). There is a similar article from these two authors in a previous publication that includes measures of the constructs of interest (Avolio & Hannah, 2008).

43. DeRue, D.S., Nahrgang, J.D., Wellman, N., & Humphrey, S.E. (2011). Trait and behavioral theories of leadership: An integration and meta-analytic test of their relative validity. *Personnel Psychology*, 64, 7-52.

This article examined the relative validity of leader traits and behaviors in relation to leadership effectiveness. Additionally, the article integrated the literature on traits and behaviors by proposing that leader behaviors mediated the relationship between leader traits and leadership effectiveness. Four leadership effectiveness criteria were included: individual leader effectiveness, group performance, follower satisfaction with leader, and follower job satisfaction.

Leader traits explained between 2% and 22% of the variance in leadership effectiveness, with conscientiousness, agreeableness, and extraversion being the most relevant traits. Leader behaviors explained between 20% and 70% of the variance in leadership effectiveness criteria. The most relevant behaviors were transformational, contingent reward, consideration, and initiating structure. Combined, leader traits and behaviors explained 31%-92% of the variance in leadership effectiveness criteria. There was partial support found for behaviors mediating the trait-effectiveness criteria relationships (e.g., consideration & transformational behaviors mediated the relationship between Extraversion and effectiveness).

The authors pointed out that there was an issue in the leadership literature regarding a proliferation of new constructs without much consideration for whether or not a new construct was more relevant than previous correlates of the outcomes of interest. Some leader traits and behaviors lose their predictive validity when considered in conjunction with other leadership traits and behaviors. There is also a need to more consistently integrate different research paradigms in the literature. Leader development programs should consider leader attributes (e.g., conscientiousness), emphasize the importance of being active in the role of leader, and assess all of the important aspects of leader behavior (i.e., task, relational, and change).

Annotator's Comment: This article consolidates and simplifies some of the literature around leadership. The article integrates two distinct, yet related, areas of leadership research and allows for the field to focus on which constructs are of more importance relative to others. The article also highlights how important the criteria are in how leadership is evaluated, as the variance explained in leadership criteria by traits and behaviors varied widely depending on the criteria (e.g., $R^2 = .31$ for group performance and $.92$ for satisfaction with leader).

44. Dragoni, L., Oh, I., VanKatwyk, P., & Tesluk, P. E. (2011). Developing executive leaders: The relative contribution of cognitive ability, personality, and the accumulation of work experience in predicting strategic thinking competency. *Personnel Psychology*, 64, 829-864.

This article examined a novel conceptualization of work experience in relation to the strategic thinking ability of executive business leaders who participated in an assessment center for their own development or in helping their organization to make a selection decision. Specifically, the authors examined how the accumulation of work experience, defined as the number of varied roles and responsibilities leaders have had in key work activities over the

course of their careers, related to the leaders' strategic thinking ability. Additionally, the authors examined the effect of accumulated work experience in the context of cognitive ability and personality.

Strategic thinking was measured using five assessment center exercises: a detailed background interview, a simulated multi-discipline task force team, a business management simulation, and simulated meetings with different stakeholders. Consultants, usually with a PhD in psychology, assessed the leader's strategic thinking ability in each exercise. Accumulated work experience was measured using the Leadership Experience Inventory (VanKatwyk & Laczko, 2004), a commercial measure of the variety of leadership experiences a manager may have over the course of their career. The novel use of the measure involved participants indicating for each experience whether they had been involved in any of three roles: contributor, manager, and/or lead strategist. For each work activity, participants received a score of 3 if they had held all of the roles, 2 for holding any two roles, 1 for any one role, and 0 for no roles.

Of all the predictors, cognitive ability was overwhelmingly the strongest predictor of the strategic thinking competency and explained 22% of the variance in the competency, which was 80% of the overall variance explained in the competency. Accumulated work experience was the second strongest predictor and explained an additional 2% variance in the competency, which was 7% of the overall variance explained in strategic thinking. The authors found support for a model in which cognitive ability and openness to experience had direct effects on strategic thinking, and extraversion had an indirect effect on strategic thinking via accumulated work experience.

Annotator's Comment: The most notable contribution of this article is the unique conceptualization and operationalization of work experience. This approach goes well beyond traditional accounting of work experience that focuses on job, career, or organizational tenure. Additionally, this article examines specific leadership ability as opposed to broad outcomes such as leader emergence or effectiveness. The authors demonstrate that specific and varied forms of experience are relevant to leadership skills, and they also show that varied forms of experience are important even in the context of other intelligence and personality variables.

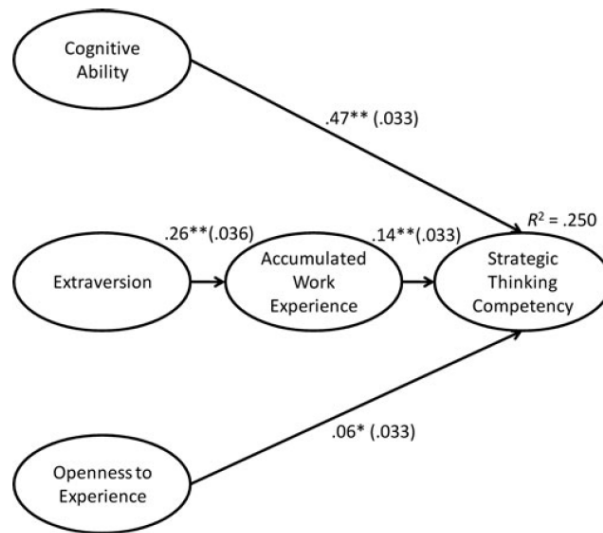


Figure 11

Confirmed model featuring the antecedents and consequences of executives' accumulated work experience

Note. Figure 11 is from “Developing executive leaders: The relative contribution of cognitive ability, personality and the accumulation of work experience in predicting strategic thinking competency” by L. Dragoni, I. Oh, P. VanKatwyk, and P. E. Tesluk, 2011, *Personnel Psychology*, 64, p. 834. Copyright 2011 by Wiley Periodicals, Inc; Values in parentheses are standard errors for path coefficients; * $p < 0.05$ and ** $p < 0.01$.

45. Kraimer, M.L., Seibert, S.E., Wayne, S.J., Liden, R.C., & Bravo, J. (2011). Antecedents and outcomes of organizational support for development: The critical role of career opportunities. *Journal of Applied Psychology*, 96, 485-500.

This study highlighted the importance of employees' perceptions of organizational context in relation to their job performance and turnover. The authors defined and examined two new constructs and their effects on performance and turnover: organizational support for development and perceived career opportunity. Organizational support for development (OSD) was defined as, “employees' overall perceptions that the organization provides programs and opportunities that help employees develop their functional skills and managerial capabilities” (p. 486). Perceived career opportunity (PCO) was defined as, “employees' belief that jobs or positions that match their goals and interests exist within the organization” (p. 486).

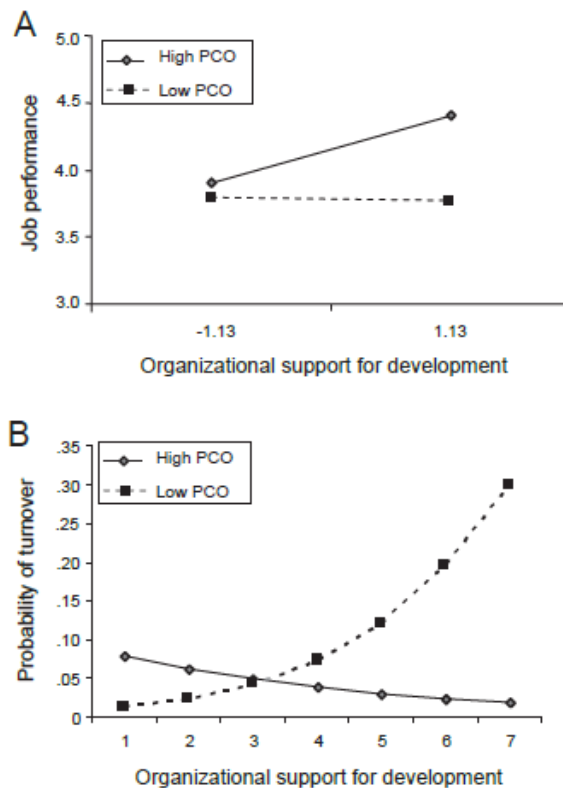


Figure 12

Interaction effects of organizational support for development x perceived career opportunity (PCO) for job performance (Panel A) and probability of turnover (Panel B)

Note. Figure 12 from “Antecedents and outcomes of organizational support for development: The critical role of career opportunities” by M. L. Kraimer, S. E. Sieber, S. J. Wayne, R. C. Liden, and J. Bravo, 2011, *Journal of Applied Psychology*, 96, p. 494. Copyright 2011 by the American Psychological Association.

Data were collected from 264 employees and 198 employee-supervisor dyads for the testing of the hypotheses. Participants were exempt-level employees of a *Fortune* 500 manufacturing firm in the United States. Turnover data were made available to the authors one year after the survey administration.

Participation in training, workshops, leader-member exchange, and career mentoring were all positive correlates of perceived OSD—high-potential program participation was negative, but only in regression controlling for other correlates; participation in job rotations and tuition reimbursement program were not related to OSD. The main effects of OSD and PCO on job performance were not significant, however the interaction term between them was significant and explained an additional 3% of the variance in job performance. This result indicated that OSD was positively related to job performance when PCO was high, but not when PCO was low.

Similarly, when examining turnover, OSD decreased the probability of turnover when PCO was high, but increased the probability of turnover when career opportunity was low.

Annotator's Comment: This study is a good demonstration of what factors influence employees' perceptions that their organization supports development. Additionally, the study shows how the effect of this perception on outcomes that organizations value (e.g., performance and turnover), is conditional on whether employees also perceive further opportunity within that company. The relational influence of leaders and managers within an organization is also made apparent in the current study as LMX and career mentoring were positively related with perceived OSD and PCO. Investment in career development opportunities alone may not be sufficient to improve performance and reduce turnover, rather employees must also see that they have an opportunity to continue towards their goals within a company.

46. Reichard, R.J., & Johnson, S.K. (2011). Leader self-development as organizational strategy. *The Leadership Quarterly*, 22, 33-42.

Due to the cost of formal organizational training and the ever-changing dynamics of the environments organizations operate in, this paper argues that organizations need more cost effective and adaptive strategies for leader development. One avenue is for organizations to develop strategies to stimulate leader self-development, defined as, "any self-initiated behavior focused on developing leadership capacities" (p. 35). However, in order for organizations to capitalize on leader self-development they must first establish organizational and group level processes to enable leaders to increase their human capital. Whereas individuals are in control of their own development as leaders (individual development), the organization must prepare the context within which leadership (collective development) takes place.

This article puts forth a multilevel model (organizational influences, group influences, and individual influences) of leader self-development along with corresponding propositions for how multiple levels within an organizational and group context influence the individual leader's self-development. From the organizational to the group level, organizational strategy is proposed to influence the human resource processes (selection, training, & performance processes) that reinforce or inhibit leader characteristics related to motivation to develop leadership. Additionally, organizational strategy influences the investment and availability of resources (technology, direct supervisor, and social networks) that aid in leader self-development. The group norms around self-development (learning, responsibility, and openness) are indirectly influenced by organizational strategy (via HR processes). The group level processes of group norms and organizational resources moderate the mediated relationship between leader characteristics (KSAs) and leader self-development (mediated via motivation to develop leadership).

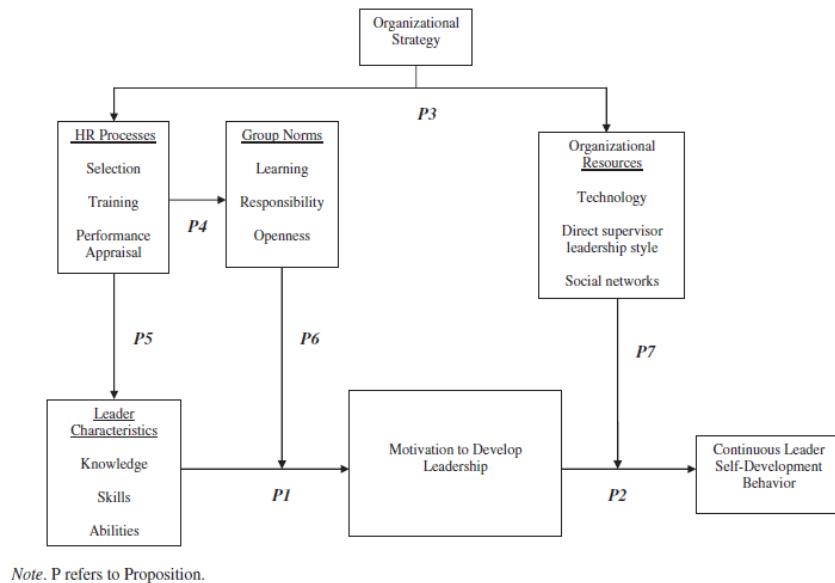


Figure 13

Multilevel model of leader self-development

Note. Figure 13 is from “Leader self-development as organizational strategy” by R. J. Reichard and S. K. Johnson, 2011, *The Leadership Quarterly*, 22, p. 34. Copyright by the Elsevier Inc; P refers to proposition.

Annotator’s Comment: This paper offers an alternative strategy for organizations to adopt in their efforts to develop their leaders. However, it is unclear why leader self-development strategy is preferable to other strategies. In other words, the boundary conditions that may dictate why an organization should adopt this strategy over a more traditional organizational approach are unclear beyond a brief introduction that traditional approaches “may not adequately prepare leaders” (p. 33). In spite of this, the authors do propose a sound model with accompanying propositions for how multiple levels within an organization are likely to influence the motivation of leaders and the ability of leaders to engage in self-development. There is no doubt that much of leader development occurs outside the bounds of formal onboarding, training, etc. However, it remains an open question as to how employees will respond to organizations shifting the onus on leaders to develop themselves.

47. Johnson, R.E., Venus, M., Lanaj, K., Mao, C., & Chang, C.H. (2012). Leader identity as an antecedent of the frequency and consistency of transformational, consideration, and abusive leadership behaviors. *Journal of Applied Psychology*, 97, 1262-1272.

This study examined the effect of different levels of leader identity (collective, relational, and individual) on daily behaviors as a leader (transformational, consideration, and abusive supervision). Additionally, the study proposed that the average frequency (mean of leader behaviors) and behavioral consistency (standard deviation of leader behaviors) would mediate the relationship between different identity levels and subordinate perceptions of leader effectiveness.

The sample was comprised of 53 managers enrolled in an MBA program. They completed scales of collective (self-definition based on group membership), relational (dyadic connection with specific person), and individual (self-definitions in relation to separateness from others) levels of identity. Over the course of three weeks, each manager also completed a daily survey of the three types of leadership behavior at work. Finally, subordinates rated their leaders' overall effectiveness (between one and three raters per leader).

Leader collective and relational identities were positively related to average transformational and average collective identities. Leader collective identity was negatively related to variance in transformational behavior, and leader relational identity was negatively related to variance in consideration behavior. Leader individual identity was positively related with abusive behavior and negatively related to variance in this behavior. Additionally, it was found that individual identity had stronger relations with abusive behavior when collective identity was weak compared to when it was strong. Transformational behavior (frequency and consistency) and abusive behavior (frequency) were the notable predictors in a regression with leader effectiveness as the criterion. The relationship between collective identity and leader effectiveness was mediated by transformational behavior. The relationship between individual identity and leader effectiveness was mediated by abusive behaviors.

Annotator's Comment: This study demonstrates the importance of leader identity in influencing behavior and subordinate perceptions of that leader's effectiveness. Additionally, the study highlights how the levels of identity are important and how those levels may interact. The demonstration of how behavioral frequency and consistency of leader behaviors predict and mediate relationships was also unique and shows how behavioral consistency can add in the prediction of leader effectiveness. There was a notable degree of within-person variance for the leader behaviors over the three-week period (37% for transformational, 47% for consideration, and 61% for abusive behavior). Training of leaders is important, particularly as the leaders transition. However, training of leaders should not just focus on increasing behaviors, but increasing and making behaviors more consistent.

48. Dragoni, L., Park, H., Soltis, J., & Forte-Trammell, S. (2014b). Show and tell: How supervisors facilitate leader development among transitioning leaders. *Journal of Applied Psychology*, 99, 66 - 86.

This study advances the understanding of how leaders develop via work experience in relation to supervisor behavior, in the context of transitioning leaders, and with a longitudinal design. Two forms of supervisor support are examined: role modeling of effective leadership

behavior and the provision of job information. Additionally, two indicators of leader development are examined: acquisition of role knowledge and time allocated to leading others.

The sample consisted of 110 first-line leaders in a global technology company. Data were collected over four time points during a 10-month period and surveys were administered via online questionnaire.

The rate of change in self-perceived role knowledge was linear and positive. Supervisor role modelling behavior was positively related with leaders' self-perceived role knowledge. This effect interacted with provision of job information and time, such that there was an accelerated rate of growth when more information was provided by the supervisor. Leaders' growth trajectory was positive when their supervisor provided high levels of role modeling and provision of job information. Those transitioning leaders who had not previously worked with an exceptional leader exhibited the greatest improvement under high quality supervision. Lastly, it was found that transitioning leaders who had greater self-perceived role knowledge allocated more time leading others and supplemental analysis demonstrated that transitioning leaders were spending an appropriate amount of their time leading others in relation to what the upper-level management expected of them.

Annotator's Comment: This study demonstrates the value of having active supervisors to help support transitioning leaders as they learn to navigate their new roles. The longitudinal nature of the data collection strengthens the conclusions made in the paper, although stronger causal conclusions can only be made with an experimental or quasi-experimental design.

49. Junker, N.M., & van Dick, R. (2014). Implicit theories in organizational settings: A systematic review and research agenda of implicit leadership and followership theories. *The Leadership Quarterly*, 25, 1154-1173.

This article is a review of the implicit leadership and followership theories literature that organizes the existing research and outlines an agenda for future research. Individuals hold their own personal prototype of what constitutes a good or bad leader/follower. The authors categorize these prototypes based on the prototype norm (typical vs. ideal leaders/followers) and prototype valence (positive vs. negative vs. neutral). Typical prototypes capture the average of a category (follower or leader) and are referred to as central tendency-based prototypes. Ideal prototypes, or goal directed-based prototypes, represent expectations of what an individual would like group members to be or not be. Positive prototypes are desired attributes (ideal in relation to goal or prototypical in relation to central tendency). Negative prototypes are undesirable attributes (counter-ideal in relation to goal or antiprototypical of average member). Neutral prototypes are irrelevant attributes.

Two commonly used implicit leadership theory (ILT) measures (Offermann et al., 1994; House et al, 1999) differ in the prototype norm (typical vs. ideal) that is being measured, which can lead to different findings. For example, consistent positive effects have been found for a leader's fit with a positive prototype, however, there have been inconsistent findings on the relevance of fitting negative prototypes. The authors attributed this effect to different operationalizations of negative prototypes in different measures (e.g., laissez-faire leadership

used as negative prototype when it really is an absence of leadership). Additionally, there is evidence of an interaction of prototype valence and prototype norm such that an attribute may represent a typical leader but may not be desirable for an ideal leader or vice versa.

Sex, culture, and age were found to be important contextual factors that influence the implicit theories. Men tend to have an advantage with respect to leadership prototypes relative to women. Whereas some attributes are universally desired of leaders (e.g., plan ahead, communicative), others are culturally influenced (e.g., Chinese leaders should be in the mold of public servants and U.S. leaders should be encouraging and individualistic). Lastly, younger employees tend to have more of an advantage over older employees through implicit processes.

Annotator's Comments: This article serves as a comprehensive review of the relevant literature, although it becomes obvious that implicit followership theories (IFTs) are given less focus. One issue that is noted by the authors is that no empirical research was found that examined impact of ILT and IFT in the same study. Additionally, there was virtually no incorporation of objective measures (i.e., performance and turnover) in relation to ILT and IFT literature. This review serves as a good resource for considerations that researchers should keep in mind in relation to ILF and IFT.

50. Zaccaro, S.J., Connelly, S., Repchick, K.M., Daza, A.I., Young, M.C., Kilcullen, R.N., Gilrane, V.L., Robbins, J.M., & Bartholomew, L.N. (2015). The influence of higher order cognitive capacities on leader organizational continuance and retention: The mediating role of developmental experiences. *The Leadership Quarterly*, 26, 342-358.

The purpose of this paper was to try and resolve the mixed findings relating mental ability to turnover, or in this case with a military sample, continuance. Past literature has examined general mental ability, given its well-established relationship with job performance. However, the authors propose that more specific cognitive skills (complex problem solving and divergent thinking) should be more strongly related to continuance given that those skills are more needed at higher levels (particularly within closed personnel systems). They hypothesized that this relationship would be mediated by developmentally-oriented career experiences.

The hypotheses were tested using an archival dataset collected in the early 1990s (1992/1993). They matched that database with continuance scores collected in 2008, to get a sample of 640 officers in the U.S. Army. Continuance was measured up to 2008 as the total number of years a participant served (or continued to serve).

Using multiple regression analysis, complex problem solving and divergent thinking were significant predictors of continuance in the Army, while verbal reasoning and writing skills were also accounted for (and not significant). It is also important to note that these capacities predicted continuance after controlling for demographic, personality, and skill variables, although this was only presented in the appendices. Complex problem solving and divergent thinking were also significantly related to development experiences for the entire sample, whereas when the sample was split to examine majors and lieutenant colonels, only divergent thinking was a significant predictor of developmental experiences. Developmental experiences

was a significant predictor of continuance, and exhibited a more considerable effect size for lieutenant colonels.

For the total sample, complex problem solving and divergent thinking did have significant indirect effects on continuance via developmental experiences. For majors and lieutenant colonels, only divergent thinking had a significant indirect effect on continuance via developmental experiences.

Annotator's Comment: This study finds that contrary to the argument that it would be harder to retain personnel of greater cognitive ability in the military, personnel with greater complex problem solving and divergent thinking abilities actually had greater continuance. The results of this study may not be generalizable as the sample was operating within a closed personnel system. The authors of this study were not able to assess whether participants perceived external opportunities. The fact that only divergent thinking skills had a significant indirect effect on continuance for majors and lieutenants suggests that different skills may be required at that level.

51. Chrobot-Mason, D., Gerbasi, A., & Cullen-Lester, K.L. (2016). Predicting leadership relationships: The importance of collective identity. *The Leadership Quarterly*, 27, 298-311.

The purpose of this study was to investigate leadership relationship in a network of employees. The authors aimed to better understand how a person's collective identity, defined as an individual's level of identification with their team, related to whether the individual saw others and was seen by others as a source of leadership (operationalized as being a source of direction, alignment, and commitment).

Participants were 41 members of a research and development division within a pharmaceutical company. The participants belonged to nine teams and were distributed across three locations with the possibility to interact on a daily basis. Data were collected at two time points, five months apart, with demographic, attitudinal, and performance data collected at time one, and the social network analysis conducted at time two. The roster method was used in which the names of participants' coworkers were listed and participants indicated which people they knew. Among the coworkers that participants knew, participants also indicated whom they consulted for information and the extent to which participants viewed those other individuals as sources of leadership.

The authors' initial sets of findings related to things they controlled for in hypothesis testing. Notably, leadership ties tended to be reciprocated. Individuals who were receiving information were more likely to view the conveyer of information as a leader, and individuals who were high performers were less likely to see others as leaders. Individuals in formal roles were less likely to see others as leaders and were more likely to be viewed as leaders.

Related to the hypotheses, individuals were more likely to be seen as leaders when they had strong organizational identification (a result not found for strong team identification).

Individuals who identified strongly with the organization and/or team were more likely to see others as sources of leadership.

Annotator's Comment: Leader development literature has strongly suggested and provided preliminary evidence for the importance of individual identity in leader development. This study shows that it is not just a sense of individual identity, but also a sense of collective identity that can influence whether one is perceived as a leader or not. Future studies that examine an individual's leader identity in relation to development should pay additional attention to collective identity as well.

52. Epitropaki, O., Kark, R., Mainemelis, C., & Lord, R.G. (2017). Leadership and followership identity processes: A multilevel review. *The Leadership Quarterly*, 28, 104-129.

This article consolidates and organizes the leadership and followership identity literatures based on the level of self (intrapersonal, relational, and collective) and the level of analysis (intrapersonal, interpersonal, and group). Leadership identity is defined in the paper as, "a sub-component of one's working self-concept that includes leadership schemas, leadership experiences, and future representations of oneself as a leader" (p. 107). Follower identity is defined as, "a sub-component of one's working self-concept that includes followership schemas, followership experiences, and future representations of oneself as a follower" (p. 107). Many other relevant terms to the identity research are defined (e.g., self-concept, self-schema, identity work, situated identity). Research and theories of leader and follower identity are summarized for each level of self and level of analysis.

The two most common forms of measurement used in the literature involve self-report scales (e.g., Tennessee Self Concept Scale, Self-Description Questionnaire) and indirect measures (e.g., Implicit Association Test). Follower identity is not given as much attention and there are fewer scales and attempts to measure it indirectly.

The areas for future research to address are broken down by intrapersonal, interpersonal, and group level. The main areas for intrapersonal research to address involve motivation, social cognition, personality, emotion, and diversity. The areas for interpersonal research to address involve attachment style and identity threat. Lastly, research at the group level can more adequately address organizational characteristics and authentic leadership.

Annotator's Comment: This article does a good job synthesizing and organizing the leader and follower identity literatures in a way that makes sense to readers. The article defines key concepts that are central to the area of research. It is important to note that while the article summarizes plenty of empirical studies in the leader and follower identity literature, a majority of the papers in the field are conceptual in nature, particularly with respect to the intrapersonal and interpersonal levels of identity.

53. Heslin, P. A., & Keating, L. A. (2017). In learning mode? The role of mindsets in derailing and enabling experiential leadership development. *The Leadership Quarterly*, 28, 367-384.

This article outlines an agenda for leader development research in the context of mindful experiential learning process (Ashford and DeRue, 2012). The experiential learning process is comprised of three phases: (1) approach, (2) action, and (3) reflection. The research agenda put forth incorporates research involving growth and fixed mindsets.

Fixed versus growth mindsets differ in that a fixed mindset is the assumption that personal attributes are stable and unchanging, whereas a growth mindset reflects the assumption that personal attributes can change as a result of practice. These mindsets are proposed to guide the way people think, feel, and act in achievement situations, particularly in instances where setbacks are encountered. In the current paper, these mindsets are thought to influence the motives leaders have when navigating developmental experiences (i.e., self-enhance vs. self-improve).

The authors outline a set of research propositions that examine the organizational factors that influence employee mindsets and how leader mindsets influence their respective development.

Table 9

Foci of self-enhancement and self-improvement motives during each phase of the experiential learning process

Phase and elements	Self-enhancement motive	Self-improvement motive
<i>Approach: commit to a learning mindset</i>		
→ Embrace a learning orientation	Focus on affirming existing leadership strengths Avoid challenging, risky development opportunities	Focus on understanding and developing areas most in need of improvement Seek challenging, risky development opportunities
→ Set learning goals	Set such vague, readily attainable learning goals that outcomes are unlikely to be threatening	Set such specific, challenging learning goals that positive outcomes are not assured
<i>Action: create and capitalize on learning opportunities</i>		
→ Plan and engage in experiments	Establish vague indicators of experiment outcomes Engaging in ad hoc experimentation	Establish specific indicators of experiment outcomes Systematically experiment with alternative approaches
→ Engage in feedback seeking	Seek mostly positive, validating feedback Distort and discount feedback, discredit source of feedback and/or avoid risky challenges	Seek feedback about strengths and areas that could be improved Take responsibility for one's performance and strive to understand what feedback suggests about how to improve
→ Regulate disruptive emotions	Be anxious and worry when setbacks are encountered Become distracted when disappointed	Maintain relative equanimity when setbacks are encountered Stay focused when disappointed
<i>Reflection: capture the lessons of experience</i>		
→ Diagnose cause-and-effect	Take credit for successes and attribute shortcomings to uncontrollable, external factors	Explore the role played by oneself, others, as well as external factors in the outcomes attained
→ Consider counterfactuals	Consider how things could have gone worse Feel diminished by other leaders' achievements	Consider how things could have gone better Feel inspired by other leaders' achievements
→ Distill lessons learned	Document successes and "safe" areas for improvement	Document successes and areas where improvements could make the biggest positive difference to future performance

Note. Table 9 is from “In learning mode? The role of mindsets in derailing and enabling experiential leadership development” by P. A. Heslin and L. A. Keating, 2017, *The Leadership Quarterly*, 28, p. 374. Copyright 2017 by the Elsevier Inc.

Annotator’s Comment: This article brings together three different literature areas to help inform future research on leader development (i.e., mindset research, performance feedback, and leadership development). Contrary to past research in leader identity (Day & Dragoni, 2015; Day & Sin, 2011), the authors propose that a strong leader identity could potentially undermine

leader development, particularly in contexts where projecting confidence is valued over a learning culture. This article puts forth a theoretical model that is useful for future research on leader development, and diverges from other leader development theories, particularly with respect to leader identity.

54. Miscenko, D., Guenter, H., & Day, D. V. (2017). Am I a leader? Examining leader identity development over time. *The Leadership Quarterly*, 28, 605-620.

This study serves as one of the first longitudinal studies that tracks changes in leader identity over the course of a 7-week leader development program. The study defines leader identity in accordance with Day and Harrison (2007) defining it as a, “sub-component of one’s identity that relates to being a leader or how one thinks of oneself as a leader” (p. 365). The sole purpose was to examine the trajectory of leader identity with the main assumption being the trajectory would be curvilinear and self-perceived leadership skill (initiating structure and consideration behaviors) would be related to changes in leader identity.

The sample consisted of 98 postgraduates enrolled in a 7-week leadership course in a Dutch business school. Participants met in small groups of 12-15 twice a week for two hours and engaged in an interactive presentation (videos, role plays, group discussions) on leadership by participating students. Students had assigned readings prior to sessions and were required to submit reflection writings on their own leadership development. Approximately half of the students took a leader development workshop (one 2 hour session) during the first half of the course, whereas the other students completed the same workshop during the second half of the course. Participants completed questionnaires each week, with the exception of week two for a total of seven measurement points. Latent growth curve modeling was used to model the growth trajectory.

Overall, support was found for a positive and curvilinear growth curve trajectory. Extraversion was used as a control, but had a significant effect on the initial level of leader identity. Higher levels of initiating structure were positively related to subsequent changes in leader identity. However, changes in initiating structure were not related to subsequent changes in leader identity. Unexpectedly, the authors found that previous changes in consideration skills were negatively related to changes in leader identity, so participants who reported an increase in consideration skill also reported a decrease in leader identity the subsequent week. The authors proposed that this could be due to consideration behaviors not being as closely associated with implicit leadership theories as other leader attributes.

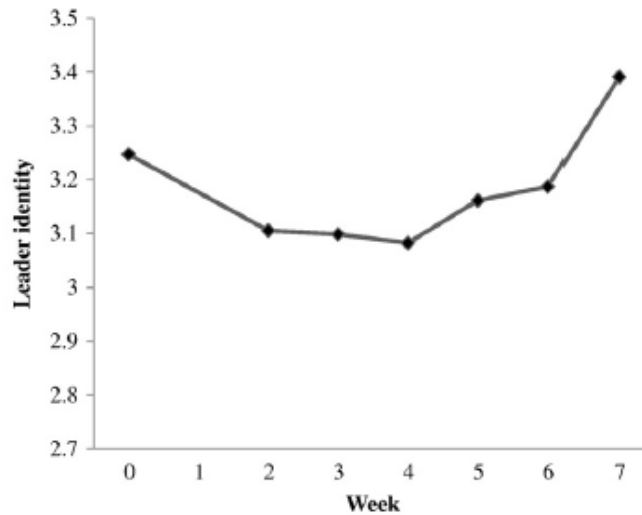


Figure 14

Leader identity developmental trajectory among study participants

Note. Figure 14 is from “Am I a leader? Examining leader identity development over time” by D. Miscenko, H. Guenter, and D. V. Day, 2017, *The Leadership Quarterly*, 28, p. 614. Copyright 2017 by the Elsevier Inc; Week 1 excluded due to public holiday.

Annotator’s Comment: This study was one of the earliest empirical studies that longitudinally examined leader identity over time. The study highlights the complexity and dynamism of leader development over time as leader identity had a curvilinear trajectory, suggesting that development is a process of gains and losses. There was one major unexpected finding: Changes in consideration skill being negatively related with subsequent changes in leader identity. There were some sample restrictions, however, as only 16% of the sample reported that they currently held a supervisory position. This study serves as an important model for future leadership development research.

55. Riggs, B. S., & Porter, C.O.L.H. (2017). Are there advantages to seeing leadership the same? A test of the mediating effects of LMX on the relationship between ILT congruence and employees' development. *The Leadership Quarterly*, 28, 285-299.

This study considered whether congruence between leader and follower with respect to implicit leadership theories (ILTs) would relate to the reported quality of the leader-follower relationship, operationalized as leader-member exchange (LMX). ILTs are the individually held beliefs and perceptions regarding the characteristics that are prototypical (e.g., dedicated) or antiprototypical (e.g., tyranny) of a leader. The study tested whether leader-follower

congruence/agreement on both prototypes and antiprototypes would be positively related to LMX.

The final sample included 74 matched employee-supervisor dyads. Employees were part-time MBA students and most of the sample (71%) were in nonmanagement roles. ILTs and engagement definitions were assessed in the first survey, and the second survey (3 weeks later) had LMX questions. Supervisors were independently contacted and provided their ratings of ILTs. Hypotheses were tested using polynomial regression with response surface analysis.

LMX was highest when employees and supervisors were similar, as opposed to when employees and supervisors were different, with respect to their ratings of prototypical leader characteristics. There was no effect of antiprototype congruence on LMX, although supervisors who rated antiprototypical as more characteristic of leaders had lower LMX as rated by their employees than supervisors who rated the traits as less characteristic of leaders. Additionally, supervisors who rated antiprototypical as more characteristic of leaders had employees who reported engaging in fewer developmental activities relative to supervisors who rated the traits as less characteristic of leaders. LMX was positively related with employee reports of engaging in developmental activities. Only limited support (after relaxing criteria of significance) was found for LMX mediating prototype congruence relationship with developmental activity.

Annotator's Comment: This study demonstrates the importance of supervisors in the development of employees, as supervisors who thought antiprototypical traits were characteristics of leaders had employees who reported they engaged in fewer developmental activities. Also, employees who reported better LMX also reported as engaging in more developmental activities. This article could have reported the results of the polynomial regression with response surface analysis. An article by Shanock, Baran, Gentry, Pattison, and Heggstad (2010) has a good outline of that procedure. This analysis can be helpful to examine how the congruence (or incongruence) between two variables (e.g., leader ILT and follower ILT) relate to outcomes.

56. Seibert, S.E., Sargent, L.D., Kraimer, M.L., & Kiazad, K. (2017). Linking developmental experiences to leader effectiveness and promotability: The mediating role of leadership self-efficacy and mentor network. *Personnel Psychology*, 70, 357-397.

Leader development is thought to be largely driven by experience. This study investigated the effect of both formal (formal development programs) and informal (developmental job challenge and developmental supervision) experiences on supervisor assessments of a leader's effectiveness and promotability. The authors propose that experience influences these outcomes via increased leadership self-efficacy and the size and quality of the leader's mentor network.

The final sample included 235 matched manager-supervisor dyads. The focal managers and their supervisors worked in a large Australian retail organization. Firstline managers were sent a survey to gather the degree to which they engaged in both formal and informal developmental experiences, their leadership self-efficacy, mentor network (number of mentor

contacts and the quality of each relationship). Matched supervisors rated each manager's leadership effectiveness and promotability two months later.

Leadership self-efficacy mediated the indirect effect of developmental job challenge to leadership effectiveness and promotability. However, leadership self-efficacy did not mediate relationship for formal development programs of developmental job challenge. Mentor network did mediate the indirect effect of developmental job challenges on promotability. None of the other mediations worked out. Both informal experiences (developmental job challenges and developmental supervision) were significantly related with mentor network size and quality. Furthermore, the authors found that formal developmental programs had significant indirect effects on leadership effectiveness and promotability (via leadership self-efficacy), in the sense that there were low informal experiences (developmental job challenge and developmental supervision). Unexpectedly, formal developmental programs also had a significant indirect effect on those outcomes when informal experiences were high.

Annotator's Comment: Given the importance placed on experience in the development of leaders, this study demonstrates that both formal and informal experiences influence the leadership self-efficacy and mentor networks of managers. Interestingly, the formal and informal job experiences did not exhibit significant zero-order correlations with supervisor ratings of leadership effectiveness or promotability. However, developmental job challenges did have an indirect effect on leadership effectiveness (via leadership self-efficacy) and on promotability (via leadership self-efficacy and mentor network). The relevance of developmental job challenges, which captures the variety of different responsibilities a leader has had in the workplace, is noteworthy as it is not just the length of experience but the qualitative and diverse nature of experience that is relevant.

57. Zaccaro, S.J., Green, J.P., Dubrow, S., & Kolze, M. (2018). Leader individual differences situational parameters and leadership outcomes: A comprehensive review and integration. *The Leadership Quarterly*, 29, 2-43.

This paper is a great resource to understand the research that has been done examining leader attributes in relation to common leader outcomes such as leader emergence and leader effectiveness. The proliferation of research examining leader attributes and outcomes has led to many different models of how individual differences and processes relate to leadership outcomes. One of the goals of the article was to integrate these various models. Another goal of this article was that, given the growth in the leader attributes literature, there are many different constructs and processes through which outcomes are affected. Subsequently, there is a need to understand the nature of relationships between these attributes and processes. Finally, the authors integrate into their model the role of leadership situation in influencing the relationships between leader attributes and leader outcomes.

The review distinguishes between two types of leader attributes: foundational traits and leadership capacities. The authors define foundational traits (e.g., personality, cognitive abilities, motives, and values) as, "individual differences that (a) predispose an individual toward broad engagement in the leader role and in more specific manifestations of that role in particular

contexts (*role predisposition*), and (b) facilitate the leader toward the growth and development of more specific skill sets (*growth facilitation*)” (p. 9). Leadership capacities (e.g., cognitive skills, social capacities, knowledge, and expertise) were defined as, “KSAs and leadership styles that predispose individuals toward particular leadership behaviors in different leadership contexts” (p. 9). The authors emphasize the importance of research that examines configurations and patterns of traits and capacities (i.e., person-centered vs. variable-centered models), as this approach allows for an examination of how combinations of leader attributes are related to leadership outcomes.

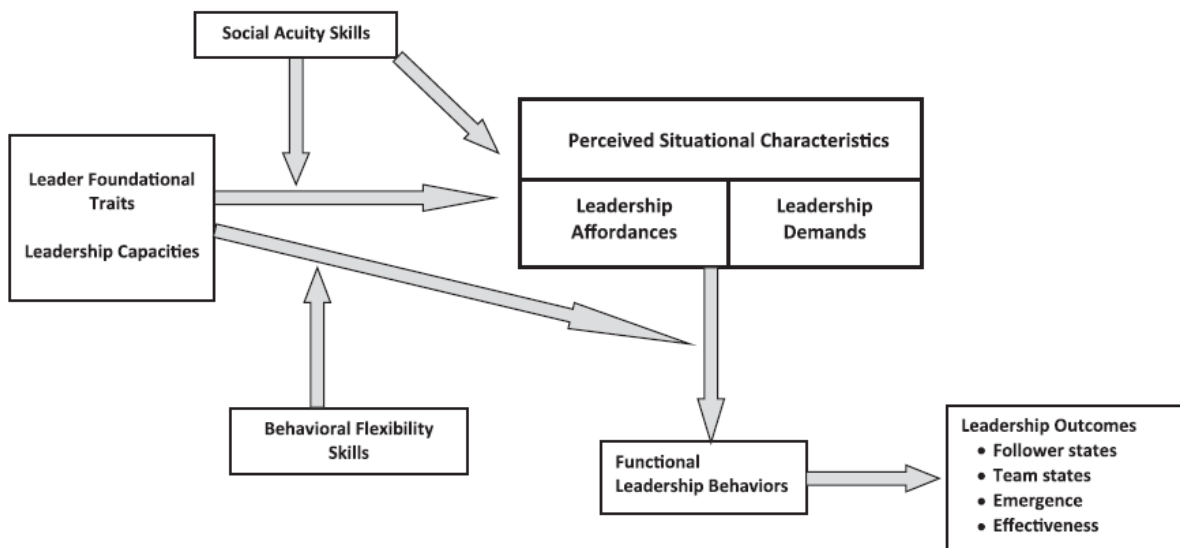


Figure 15

Relationships of leader individual differences and situational characteristics on leadership outcomes

Note. Figure 15 is from “Leader individual differences situational parameters and leadership outcomes: A comprehensive review and integration” by S. J. Zaccaro, J. P. Green, S. Dubrow, and M. Kolze, 2018, *The Leadership Quarterly*, 29, p. 6. Copyright 2018 by the Elsevier Inc.

The research summarized also includes a review of all of the process or mediator variables that have been examined to explain why leader attributes relate to outcomes. The summarization of these models highlights the complexity of relationships between traits, capacities, and skills. Multiple models find support for leader capacities being driven by foundational traits and for leadership capacities serving as mediators for other capacities. The authors call for more longitudinal research to improve tests of mediation.

The authors argue that the most unique contribution of their review and model was the incorporation of the leadership situation. The authors identify key considerations for the leader’s situation as an influence on their behavior. Some of the considerations include whether the

situation is defined objectively or subjectively, the degree of agency a leader has over a situation, and the task and social complexity of the environments within which a leader operates.

Annotator's Comment: This paper tackles the large field of leadership research and highlights the growth of the field and subsequent proliferation of different leader attributes and processes studied. Much clarity is needed both conceptually (e.g., complexity of process models and which constructs are better suited as mediators) and methodologically (e.g., more longitudinal tests of mediation as well as person-centered models) in the field to better understand leader attributes and their relation to leader outcomes. This paper presents a unique model that incorporates the leader's situation in an attempt to place leader attributes in context, while keeping in mind important considerations in person-situation perspectives (e.g., how situation is operationalized and how much influence does the leader have on the situation).

58. Moghimi, D., Scheibe, S., & Freund, A. (2019). The model of selection, optimization, and compensation. In B. B. Baltes, C. W. Rudolph, & H. Zacher (Eds.), *Work across the lifespan* (pp. 81-110). Academic Press, Elsevier.

The selection-optimization-compensation (SOC) model proposes that specific goal setting strategies are critical to the growth and maintenance of abilities and well-being throughout an individual's lifespan. The use of these strategies is tied to conservation of resource theory (Hobfoll, 1989). The use of the strategies is given more importance when individuals face a discrepancy between goals, resources, and demands. The model outlines processes (i.e., selection, optimization, and compensation) that are expected to aid people in setting, pursuing, and maintaining goals in relation to internal preferences, external demands, and resource availability. This chapter outlines the SOC model and reviews the theoretical implications and empirical research regarding the overall model.

Selection simply refers to narrowing a list of goals to be more focused in developmental or maintenance efforts. Selection may be elective, which refers to the development of a hierarchy of goals that may be based on importance or preference, or they may be loss-based, in which an existing goal hierarchy must be reprioritized or amended to respond to new circumstances. *Optimization* refers to a process of maximizing the use of resources (e.g., time, attention) towards goals that are selected. *Compensation* involves the processes necessary to counteract any losses that threaten the attainment of goals or maintenance of goals that have already been achieved.

The SOC model makes two primary predictions: (a) that SOC processes are more beneficial and of greater use to resource-poor individuals (e.g., often older individuals as the SOC Model is related to aging) and (b) that the use of SOC processes is age related, peaking in middle adulthood. Research has demonstrated support for the notion that the use of the SOC strategies peaks in middle adulthood (ages 43-67 years), with the exception of elective selection, which exhibited a linear increase with age.

In addition, the empirical evidence of age in relation to the use of SOC strategies indicates that there are positive relationships with job satisfaction and job engagement (Schmitt, Zacher, & Frese, 2012), and a decrease in reported work-family conflict (Baltes & Heydens-

Gahir, 2003). There are somewhat mixed results with SOC strategies and job performance, though the relationships can differ based on each strategy. A meta-analysis found that SOC use was positively related with subjective and objective measures of job performance (Moghimi, Zacher, Scheibe, & Van Yperen, 2016). With regards to development, selection and optimization were related with a subjective measure of career development (i.e., career satisfaction), whereas only optimization was related to more objective measures of development, such as pay and level of responsibility (Abele & Wiese, 2008).

Table 10

Summary of SOC strategies and examples

	Elective Selection	Loss-Based Selection	Optimization	Compensation
Sample strategies	<ul style="list-style-type: none"> Choosing some goals over others Prioritizing goals Developing a goal hierarchy 	<ul style="list-style-type: none"> Adapting standards to new circumstances Reorganizing one's goal hierarchy Searching for new goals that are attainable despite the experienced loss 	<ul style="list-style-type: none"> Acquiring, refining, and using relevant means to achieve selected goals Showing persistence in goal pursuit Allocating important resources, such as time, effort, or attention to goal relevant means 	<ul style="list-style-type: none"> Using other means than before Acquiring new means Using so-far unused means or skills Using external help like technological aids or instrumental social support
Example of general SOC	Deciding to focus on the career first <i>before</i> starting a family, rather than both simultaneously	A professional football player who suffers from an injury focuses on being a football trainer instead	Taking a language course, and investing the time and effort into learning the new language well	A nurse who can no longer meet physical demands to lift patients asks a younger colleague for help
Example of daily SOC	Making a to-do list comprising daily tasks according to importance and relevance	If the to-do list entails working with a colleague on a joint project, but the colleague pulls out, scale down the project in a way that one can complete it alone	Investing time and effort into a daily work project until it is completed	Asking another colleague to join the project in order to be able to maintain its original scope

Note. Table 10 is from *Work across the lifespan*, by B. B. Baltes, C. W. Rudolph, and H. Zacher, 2019, p. 83. Academic Press, Elsevier. Copyright 2019 by the Elsevier Inc.

Annotator's Comment: This chapter clearly explains and outlines the SOC model. The empirical research presented in this chapter focuses mostly on employee well-being (e.g., job satisfaction, work-family conflict). However, this chapter presents empirical evidence of relationships regarding job performance and career development outcomes that are specific to certain strategies. Another article in this annotated bibliography that supports the use of the SOC strategies is not cited in this chapter (Day & Sin, 2011, AB #11). Day and Sin found that the use of selection was predictive of positive growth trajectories of leader effectiveness, compared to trajectories that were curvilinear.