Linking Developmental Experiences to Leader Effectiveness and Promotability: The Mediating Role of Leadership Self-efficacy and Mentor Network

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Abstract

We developed and tested a model linking developmental experiences to leadership effectiveness and promotability through two mediating processes based on social cognitive and social capital theories. We hypothesized that a manager's exposure to three types of developmental experiences (formal development programs, developmental job challenges, and developmental supervision) would positively relate to supervisor's assessment of the manager's leadership effectiveness in the current job role and promotability within the organization through the manager's leadership self-efficacy and size and quality of the manager's mentor network. Results based on a sample of 235 retail managers showed that leadership self-efficacy and mentor network fully mediated the relationship between job challenges and promotability, while leadership self-efficacy also fully mediated the relationship between job challenges and leadership effectiveness. Developmental supervision was indirectly related to promotability through mentor network. In addition, a 3-way interaction analysis revealed

that participation in formal development activities had a positive indirect relationship with leadership effectiveness and promotability mediated by leadership self-efficacy when a manager experienced either lower levels of job challenge and developmental supervision, or higher levels of both. Our findings contribute to leadership knowledge by examining how both formal and informal developmental experiences relate to leadership effectiveness and promotability through social processes.

Keywords: Leadership effectiveness, development experiences, developmental job challenge, social capital, leadership self-efficacy

A recent survey of over 500 executives found that two-thirds identified leadership development as their number one “human capital” priority (The Conference Board and McKinsey, 2012). This concern is reflected in reports indicating that over \$13 billion is spent annually on leadership training in the U.S. alone (Loew & O’Leonard, 2012). While scholarly discussions and reviews of leadership development practice continue to proliferate (Avolio, Reichers, Hannah, Walumbwa, & Chan, 2009; Day, 2000, 2012; Day, Fleenor, Atwater, Sturm, & McKee, 2014; Galli & Muller-Stewens, 2012) most of this work reviews formal leadership training interventions or lacks empirical testing. To date, organizations lack an evidence-based understanding of the way formal development programs and informal employee work experiences work together to develop more effective leaders. This is an important oversight because informal experiences at work are likely to be a major influence on development due to being pervasive and on-going. The field also lacks a clear understanding of *how* or *why* developmental practices and experiences develop more effective and promotable leaders, limiting our ability to target developmental experiences to the individual’s developmental needs. We begin to address this issue by testing a mediated model, grounded in social cognitive and social capital theories, linking employees’ formal and informal developmental

experiences to their leadership effectiveness and promotability.

Three broad sources of developmental experience have been identified in the leadership literature (Day, 2012; McCauley, Moxley, & Van Velsor, 1998; Yukl, 2010). *Formal development programs* include off-the-job training and educational activities designed to promote leader development and effectiveness. *Developmental job challenges* reflect the extent to which leaders face new or unique issues, problems or responsibilities during the performance of their regular job duties (McCauley, Ruderman, Ohlott, & Morrow, 1994; McCauley, Van Velsor, & Ruderman, 2010). Finally, *developmental supervision* is informal coaching and role modeling provided by one's direct supervisor during the performance of one's job duties (Arnold, Arad, Rhoades, & Drasgow, 2000). Because these developmental experiences reflect three primary contextual influences found in organizations: formal organizational programs, the job itself, and supervisors (Katz & Kahn, 1978; Kozlowski & Klein, 2000), we include all three in our model.

The purpose of this study is to test a mediated model that links managers' exposure to these three types of developmental experiences, formal development programs, developmental job challenges, and developmental supervision, to their leadership effectiveness and promotability. We propose that leadership self-efficacy and the quality and size of managers' mentor networks mediate the relationship between the developmental experiences and leadership outcomes. We also examine whether job challenges and developmental supervision moderate the effects of participation in formal development programs on leadership self-efficacy, expecting formal development programs to have their strongest effect when the other two experiences are low. A test of our theoretical model contributes to the leadership development literature by addressing three limitations in the existing literature.

First, to date, the three sources of leadership development have not been examined together in a single model (Avolio, 2007; Day, 2000), which means we do not know the unique effect of each developmental practice on leadership outcomes when experienced together, as they are likely to be in

field settings (Avolio, 2007). Further, it is theoretically reasonable to expect these three sources of development to interact to supplement or inhibit each other when experienced simultaneously. For example, formal development programs may be less impactful when the individual has already faced many developmental challenges and received developmental supervision. Thus, we currently have a limited understanding of how to best configure a collection of leadership development experiences to have the strongest impact. By incorporating the three developmental experiences in a single model, we can examine the unique effect of each source after accounting for the effects of the other two in addition to theorizing and testing for the moderating effects among the three sources of development. In short, our study makes an important contribution to the literature by allowing us to examine the way these three sources of development work together to promote effective leadership.

A second limitation of the leadership development literature that we address is the lack of theoretical knowledge regarding the underlying mechanisms that explains how and why leadership development activities relate to leadership effectiveness (Day, 2012; Day & Zaccaro, 2004; Van Velsor, Moxley, & Bunker, 2004). Indeed, Day (2000) describes research on leadership development as a collection of best practices that, as a set, lack theoretical coherence. Day (2012) further suggests that the field has failed to answer the basic question, what develops in leadership development? Failure to understand the mediating mechanisms that link participation in developmental activity with effectiveness in a leadership role is thus an important theoretical shortcoming of the current literature. Based on social cognitive theory (Bandura, 2001) and social capital theory (Coleman, 1990; Burt, 1992), we propose leadership self-efficacy and the size and quality of the individual's network of mentors as the explanatory mechanisms linking developmental experiences to the leadership outcomes. These two mechanisms represent two broad sets of individual and interpersonal resources that previous theorists argue underlie the development of leadership effectiveness (e.g., Avolio, 2007; Day, 2012; Mumford, Campion & Morgeson, 2007). Understanding the mechanisms that link developmental practices to leadership effectiveness and promotability will provide a more integrated

theoretical understanding of the leadership development process and allow organizations to design and generate more potent leadership development interventions.

Finally, a third limitation of the leadership development literature is that the two informal sources of development—developmental job challenge and developmental supervision—have not been empirically linked to the leadership effectiveness of individuals in a leadership role, as we do here. Developmental job challenges have been shown to positively relate to leadership role attainment (e.g., Arvey, Zhang, Avolio, & Krueger, 2007) and supervisor ratings of subordinates' skills and competencies, such as cognitive skills, interpersonal skills, and strategic business knowledge (e.g., DeRue & Wellman, 2009; Dragoni, Tesluk, Russell, & Oh, 2009), but not to the manager's effectiveness in a leadership role. Likewise, developmental supervision and empowering leadership (a broader construct that includes developmental supervision as one dimension) has been positively related to time spent leading others (Dragoni, Park, Soltis, & Forte-Trammell, 2014) and ratings of the empowering leader by the subordinate (Amundsen & Martinsen, 2014; Hassan, Mahsud, Yukl, & Prussia, 2013), but not to the leadership effectiveness of followers who themselves hold leadership roles. This is an important gap because effectiveness in a leadership role is the ultimate criteria against which to evaluate leadership development activities (Day et al., 2014). In sum, by testing a mediated model linking the three sources of developmental experiences to leadership effectiveness and promotability through social cognitive and social capital mediators, we answer the call for more integrated approaches to leadership development (Avolio, 2007; Avolio & Gardner, 2005; Day et al., 2014).

Theoretical Model

Our theoretical model links three sources of developmental experiences to leadership capacity, which we define in terms of supervisor ratings of the subordinate manager's effectiveness as a leader and promotability to higher levels of responsibility, reflecting both current and future leadership potential (see Figure 1). Our model seeks to encompass the two

major capabilities that previous models of leader development have identified as the target of development efforts: individual leadership skills and capabilities and interpersonal resources (Day et al., 2014; Galli & Muller-Stewens, 2012; Marshall-Mies et al., 2000; Mumford et al., 2007). We ground our model in two theories, social cognitive theory (Bandura, 2001) and social capital theory (Burt, 1992; Coleman, 1990; Lin, Ensel & Vaughn, 1981), which focus on these capabilities and provide the theoretical explanation for the relationship of the developmental experiences to the leadership outcomes. These theories are captured in two mediating constructs: leadership self-efficacy and size and quality of the individual's mentor network. According to social cognitive theory, it is self-efficacy that allows one to apply what one has learned to new situations and challenges. Likewise, according to social capital theory, it is one's social network of relationships that allows one to take productive action within a social context. Together, these two constructs explain how and why developmental experiences are linked to leadership effectiveness and promotability. We next introduce the key constructs of our model in detail, before proposing the specific hypotheses to be tested.

Developmental Experiences

Formal development programs. Formal training and development programs are perhaps the most widely used leadership developmental practice in organizations (Loew & O'Leonard, 2012), yet the evidence supporting their effectiveness as a source of leadership development is modest. Burke and Day (1986) and Collins and Holton (2004) meta-analyzed previous research on leadership and managerial training and reported moderate effects for leadership development ("human relations") interventions on a range of criteria, but located very few studies that included performance or leadership effectiveness as an outcome. Instead, the studies they reviewed focused primarily on learning, expertise, or knowledge acquisition related to the content of the program itself. Avolio and colleagues (2009) meta-analyzed over 200 experimental or quasi-experimental leadership

interventions and found that training programs (a subset of the studies) have a positive, but modest effect on followers' affective, behavioral, and cognitive outcomes. The authors of all three articles note the need for further research to determine both mediating constructs that explain what is developed as a result of formal leadership development programs and moderating constructs that explain when formal training may be more or less strongly related to leadership outcomes. We therefore include participation in formal development programs as an important but as yet not fully understood developmental experience, which we expect to be related to leadership capacity through its relationship with leadership self-efficacy. We further expect the strength of the association between formal development programs and leadership self-efficacy to be moderated by the extent to which the individual engages in other developmental activities.

Developmental job challenges. We also include on-the-job experience as an informal developmental experience we expect to be linked to leadership capacity. Experience is considered one of the most potent sources of learning related to leadership (DeRue & Wellman, 2009; Dragoni et al., 2009). However, experience is not equivalent to simple time on a job; rather, it is variety in the qualitative types of challenges faced on the job that provides opportunities for new learning (Tesluk & Jacobs, 1998). Leadership researchers (e.g., DeRue & Wellman, 2009; McCall, Lombardo, & Morrison, 1988; McCauley et al., 1994) have identified five dimensions of developmental challenge: unfamiliar responsibilities, high levels of responsibility, creating change, managing boundaries, dealing with employee problems and managing diversity. Empirical studies have shown the experience of job challenge relates to a number of important outcomes among middle- to senior-level managers, including self-reported learning (McCauley et al., 1994; Ohlott, 2004), supervisors' perceptions of leadership skill development (i.e., cognitive, business, interpersonal, and strategic skills) (DeRue & Wellman, 2009), supervisors' ratings of broad managerial competencies (Dragoni et al., 2009) and subordinates ratings of leaders' transformational leadership behaviors (Courtright, Colbert, & Choi, 2014). Among junior managers, exposure to job challenges has been related to

managers' promotability (De Pater, Van Vianen, Bechtoldt, & Klehe, 2009; Dong, Seo & Bartol, 2014). However, the experience of developmental job challenge has not been empirically linked to effectiveness in the leadership role, nor have the mechanisms explaining this link been empirically examined. As our model shows, we include developmental job challenge as an important developmental experience, linking it to leadership capacity through its relationships with leadership self-efficacy and the manager's mentor network.

Developmental supervision. Another source of informal development is developmental supervision. Many scholars have argued that one's immediate supervisor is one of the most important sources of development available within an organization (Dragoni et al., 2014; Kraimer, Seibert, Wayne, Liden, & Bravo, 2011; McCauley et al., 2010). However, supervisors are likely to vary considerably in the extent to which they provide developmental support and may provide different levels of support to different followers (Frankovelgia & Riddle, 2010; Scandura & Williams, 2004). Two leader behaviors that have been identified with developmental supervision are leading by example (i.e., role modeling) and coaching (Arnold et al., 2000; Bass & Avolio, 1995; Yukl, 2010). Leading by example involves supervisor behavior that demonstrates that the supervisor sets high personal standards and is committed to the work of the team or work unit (Arnold et al., 2000). Coaching refers to behaviors designed to improve the skills and self-reliance of followers, such as identifying areas in need of improvement and providing suggestions on strategies the follower can use to improve his or her performance (Arnold et al., 2000). Although these leadership behaviors have been associated with the effectiveness of the leader using them, they have not been empirically linked with the leadership effectiveness or potential of the junior manager that is the target of development (Amundsen & Martinsen, 2014; Hassan et al., 2013). We included developmental leadership in our model because we expect it to be related to the junior manager's leadership capacity through both mediators.

Mediating Mechanisms

Leadership self-efficacy. Social cognitive theory is a learning theory based on the idea that individuals learn from the observation of others in a social context (Bandura, 1977, 1986). A central component of the theory is self-efficacy, which is one's belief in one's capability to execute the courses of action necessary to perform successfully in a particular context or situation. It is, according to social cognitive theory, the development of higher self-efficacy that allows one to learn the behavioral strategies necessary to face new challenges and achieve difficult goals. *Leadership self-efficacy* refers to leaders' beliefs about their "perceived capabilities to organize the positive psychological capabilities, motivation, means, collective resources, and courses of action required to attain effective, sustainable performance across their various leadership roles, demands, and contexts" (Hannah, Avolio, Luthans, & Harms, 2008, p. 2). Researchers have identified a number of specific activities involved in leadership, which include planning, setting overall direction, delegating, coordinating tasks, communicating, and motivating others (Chemers, Watson, & May, 2000; Ng, Ang, & Chan, 2008). Leadership self-efficacy captures the individual's beliefs about his or her own capability to perform these activities effectively and is likely to provide the drive and persistence to get better at these activities over time. We propose that leadership self-efficacy is one important mediator in our model because it captures the manager's confidence in his/her leadership abilities and is likely to be shaped by developmental experiences (e.g., Day et al., 2014; Mumford et al., 2007).

Mentor network. Scholars have argued that leadership development must involve the acquisition of not only individual skills, but also social resources because both are necessary to take effective action in a social context (Avolio, 2007; Day, 2012; Mumford et al., 2007). Social capital theory is concerned with the way the pattern of *social relationships* provides access to social resources (Burt, 1992; Coleman, 1990; Lin, Ensel & Vaughn, 1981). According to this perspective, one's network of social relationships provides timely access to information, resources, and support (Burt, 1992; Lin, 1982; Seibert, Kraimer & Liden, 2001). A growing body of research examines the ways one's social network facilitates effective leadership. For example, empirical research has shown

that one's social network is related to perceived charisma and reputation as an effective leader (Balkundi, Kilduff & Harrison, 2011; Kilduff & Krackhardt, 1994; Mehra, Dixon, Brass & Robertson, 2006), perceived power and influence (Brass & Burkhardt, 1992, 1993), and the performance of the leader's team (Balkundi et al., 2011).

One way to assess one's social capital is through the examination of that individual's *ego network*, which is the network of relationships or *ties* around a single individual (e.g., Lin, 1982; Seibert et al., 2001). In this study, we focus on the size and quality of one's mentor network within the organization. The quality of the mentor network is defined as the amount of career and psychosocial support received from the set of people who act as one's mentors (Kram, 1983; Noe, 1988). The mentor network is expected to be an important mediator in our model because it provides access to the types of social resources likely to facilitate leadership effectiveness and is likely to be shaped by developmental experiences.

Hypotheses

Mediating Role of Leadership Self-Efficacy

We expect leadership self-efficacy to mediate the relationship of formal development programs to leadership capacity. Social cognitive theory suggests that self-efficacy is the mechanism through which learning is translated into effective behavior in new and challenging situations (Bandura, 2001). According to the theory, self-efficacy plays a major role in how new and challenging tasks are approached and goals accomplished. Leadership self-efficacy will determine the extent to which new leadership behaviors acquired from formal development programs are initiated, how much effort will be expended to apply these newly acquired behaviors, and how long such efforts will be sustained in the face of leadership challenges and setbacks (Hannah et al., 2008). We expect these efforts to apply one's learning to be related to performance in the leadership role. Below we explicate the specific steps in this mediation process.

First, we expect participation in formal development programs to build one's leadership self-efficacy. According to social cognitive theory, four processes influence self-efficacy perceptions: enactive mastery, role modeling, social persuasion, and one's ability to manage emotional states during task performance (Bandura, 1986, 2001). Formal development programs may be a positive source for all four of these efficacy-enhancing processes. For example, many formal development programs include case studies, discussions and interactions with teachers/trainers, and/or coaches, which provide opportunities for participants to engage in vicarious learning about leadership from the leadership role models they read about (Conger, 2010). Some formal training programs and educational courses may provide opportunities for participants to practice leadership skills through in-class role plays and group discussions. The abstract concepts and principles taught in development programs and positive feedback from teachers or trainers should also provide participants in formal programs with greater confidence in their own abilities and decrease their anxiety about their capabilities, reflecting the social persuasion and physiological processes of self-efficacy enhancement (Conger, 2010).

Second, we expect leadership self-efficacy to be related to leadership effectiveness and promotability. Managers with higher leadership self-efficacy will accurately perceive themselves to have the skills and capabilities necessary to be effective leaders and will exert more effort in a more sustained manner to perform effectively in leadership roles based on this belief (Anderson, Krajewski, Goffin, & Jackson, 2008). Social cognitive theory suggests that self-efficacy predicts not only effort, but the willingness to approach new and more challenging situations related to the domain tapped by the self-efficacy construct (Bandura, 2001). Thus, managers higher on leadership self-efficacy are also likely to seek promotion to higher levels of leadership responsibility and to demonstrate confidence, persistence, and an ability to learn and grow as leaders. Indeed, empirical evidence demonstrates that leadership self-efficacy is related to a range of positive leader outcomes, including leader and managerial effectiveness (e.g., Anderson et al., 2008; Lester, Hannah, Harms, Vogelgesang, &

Avolio, 2011), attempts to lead or assume leadership roles (McCormick, Tanguma, & Lopex-Forment, 2002; Paglis & Green, 2002), motivation to lead, and ratings of leadership potential (Chan & Drasgow, 2001; Chemers et al., 2000). These two links taken together explain how leadership self-efficacy is the mechanism through which participation in formal development programs influences leadership effectiveness and promotability.

Hypothesis 1: Leadership self-efficacy mediates the relationships between participation in formal development programs and supervisor ratings of (a) leadership effectiveness and (b) promotability.

We also expect leadership self-efficacy to mediate the relationship of developmental job challenges to leadership capacity. According to social cognitive theory, self-efficacy is the mechanism through which the learning associated with previous experience is translated into effective behaviors in new and more challenging situations (Bandura, 2001). Below we explain the specific links in this mediated relationship.

Experience, or enactive attainment is the most important factor driving self-efficacy (Bandura, 2001). Challenging on-the-job experiences offer a potent opportunity for enactive mastery. Managers who face critical developmental challenges related to leadership have both the opportunity to experiment with different behavioral strategies and to observe the impact of their behavior on important outcomes in the actual work setting. Since they are in their workplaces and are likely to experience real-world consequences from their performance, they should also have greater motivation to engage in learning and growth in response to the novel challenges of their jobs (Kanfer & Ackerman, 1989). Facing developmental challenges in one's job will also lead to reductions in anxiety related to the future enactment of effective leadership behaviors, another source of leadership self-efficacy beliefs. Recent research has also linked developmental experiences to promotability through positive emotional states, providing further support for the link between arousal, one of the antecedents of efficacy, and advancement potential (Dong et al., 2014). Enhanced skill and confidence

should be reflected in the managers' ratings of their own leadership self-efficacy (Bandura, 1986), which, as discussed above, should in turn be related to leadership capacity.

Hypothesis 2: Leadership self-efficacy mediates the relationships between developmental job challenge and supervisor ratings of (a) leadership effectiveness and (b) promotability.

Turning to our third source of development, we expect leadership self-efficacy to mediate the relationship of developmental supervision to leadership capacity. Developmental supervisors are likely to be role models for the junior employee. According to social cognitive theory (Bandura, 2001), it is through enhanced self-efficacy that the individual has the confidence to implement in their own context the successful behaviors displayed by a high-status role model.

In particular, according to Bandura (2001), observational learning is the second most powerful source of self-efficacy beliefs. A supervisor who leads by example provides the junior manager with a visible, high status model from whom to learn effective leadership behaviors. Further, coaching is a form of social persuasion that provides feedback, advice, and verbal support the junior manager can use to enact more effective leadership. Both observational learning and social persuasion are important sources of information shaping self-efficacy beliefs (Bandura, 1986; Conger & Kanungo, 1988). Indeed, previous research shows that developmental supervision relates positively to employees' job self-efficacy beliefs (Ahearne, Mathieu, & Rapp, 2005), job knowledge (Dragoni et al., 2014), and psychological empowerment, a multidimensional construct that includes competency beliefs (e.g., Seibert, Wang, & Courtright, 2011; Zhang & Bartol, 2010). Thus, we expect developmental supervision to build greater leadership self-efficacy through which it is in turn related to leadership capacity. These two links together explain how leadership self-efficacy is the mechanism through which developmental supervision relates to leadership effectiveness and promotability.

Hypothesis 3: Leadership self-efficacy mediates the relationships between developmental supervision and supervisor ratings of (a) leadership effectiveness and (b) promotability.

We also expect an interaction effect among the three developmental experiences, such that participation in formal development programs will be more strongly related to leadership effectiveness and promotability through leadership self-efficacy when both of the informal developmental experiences, developmental job challenges and developmental supervision, are low. This interaction is due to the mediating role of leadership self-efficacy. As we have argued previously, a formal development program can provide all four sources of efficacy enhancing information. However, informal, on-the-job experiences are likely to provide more salient self-efficacy cues because they provide opportunities to learn and practice skills in one's actual performance context. Thus, when both of the informal, on-the-job developmental experiences are low, the individual will attend to the efficacy enhancing cues provided from participation in formal development activities resulting in a stronger positive indirect relationship between formal development and leadership effectiveness and promotability. However, when either or both of the informal, on-the-job sources of development are high, the individual is likely to attend to the ability cues they provide and is likely to pay less attention to the cues provided by formal development activities, undermining the influence of formal development on leadership self-efficacy. As such, formal development will have a weaker positive indirect relationship to leadership effectiveness and promotability when developmental job challenges and developmental supervision are both high.

Previous research provides support for this hypothesis. For example, the tutorial approach typical of much formal training has been shown to be less effective at building self-efficacy than more active approaches that emphasize enactive mastery and role modeling, the core mechanisms of developmental job challenge and developmental supervision, respectively (Bandura, 2001; Gist, 1989; Gist, Schwoerer, & Rosen, 1989). Formal training must also overcome the "transfer of training" problem (Aguinis & Kraiger, 2009; Baldwin & Ford, 1988) because it occurs away from the job,

unlike informal development activities. Thus, the self-efficacy enhancing cues provided by participation in formal development programs are likely to have their strongest effect when both informal sources of development are low and competing cues from other, possibly more salient sources are not present. Formal development will have weaker effects when developmental job challenges or developmental supervision, or both, are high.

Hypothesis 4: The indirect effect of formal development programs on the (a) leadership effectiveness and (b) promotability via leadership self-efficacy will be stronger when developmental job challenges and developmental supervision are both low, compared to when developmental job challenges and/or developmental supervision are high.

Mediating Role of Mentor Network

We also expect the manager's mentor network to mediate the relationship of developmental job challenges and developmental supervision with leadership capacity. Since leadership is an inherently social activity, developmental experiences must enhance the individual's social capabilities if they are to be successful (Day, 2012). Social capabilities are reflected in the individual's ability to gather and mobilize social resources in the pursuit of organizational goals. We do not expect the mentor network to mediate the effects of participation in formal development programs because formal programs take place off-the-job and leave little opportunity to make connections with others in the organization. For the other two sources of developmental experience, however, social capital theory (Burt, 1992; Lin, et al., 1982) suggests that one's social network is the mechanism through which one's human capital is effectively applied in pursuit of one's goals. The size and quality of one's mentor network represents the extent to which the social capabilities acquired from developmental experiences are translated into a social network of supportive relationships within the organization that enables higher levels of leadership effectiveness. One's support network will also allow one to communicate to others one's reputation as an effective and promotable leader. Next we detail the links in this mediated effect.

Several theoretical arguments from mentoring theory lead us to expect developmental job challenges to be related to the size and quality of one's mentor network. First, high levels of job challenge, such as higher level managerial responsibility, the need to create change, or managing across organizational boundaries, are likely to expose the junior manager to a wider range of more senior managers within the organization; exposure increases the chances of forming supportive relationships (Monge & Eisenberg, 1987; McPherson, Smith-Lovin, & Cook, 2001; Podolny & Baron, 1997). Second, Higgins, Chandler and Kram (2007) argue that developmental networks form when junior managers proactively engage in development-seeking behavior. Although the antecedents of such behavior are not well understood, higher levels of job challenge are likely to provide junior managers with the legitimate need to seek information, advice, feedback or material help and thus to initiate developmental relationships (Higgins et al., 2007; Mullen, 1994). Finally, high levels of job challenges may make junior managers more attractive as protégés because senior managers may view junior managers who face more challenging responsibilities as rising stars within the organization (Allen, Poteet & Russell, 2000; Singh, Ragins, & Tharenou, 2009).

Based on social resources theory (Lin et al., 1981), we expect the size and quality of one's mentor network to in turn be positively related to leadership effectiveness and promotability. This is because a larger network of high quality developmental relationships provides higher levels of instrumental and psychosocial support to the junior manager. Such a network is likely to provide information, career advice, material support, exposure to upper echelons in the organization, protection and other types of social resources that should help the manager be more effective in their leadership role (Bartol & Zhang, 2007; Higgins & Kram, 2001; Seibert et al., 2001). Being a recipient of such career advice and support should also help the junior manager be perceived as having a higher potential for promotion into positions of greater leadership responsibility. For example, Seibert et al. (2001) showed that individuals with more developmental contacts at higher organizational levels received more career mentoring, which in turn positively related to the number of promotions over the

individual's career. Together, these arguments suggest that the size and quality of one's mentor network partially mediates the relationship of developmental job challenges with leadership capacity.

Hypothesis 5: Mentor network mediates the relationships of developmental job challenge to supervisor ratings of (a) leadership effectiveness and (b) promotability.

We also expect developmental supervision to be related to the size and quality of a manager's network of supportive relationships. First, compared to managers who receive less developmental supervision, we expect managers who are provided with more role-modeling and coaching from their supervisors to be more likely to become incorporated into the social network of relationships maintained by their supervisor (Sparrowe & Liden, 1997, 2005). This is because followers who have close relationships with their supervisor are more likely to be seen as influential, high performing, and legitimate members of the organization (Burt, 1997; Kilduff & Krackhardt, 1994; Venkataramani, Green, & Schleicher, 2010). Junior managers incorporated into their supervisors' networks are likely to have more access to managers at higher levels and thus more support from senior colleagues (Bartol & Zhang, 2007). Second, they are also likely to receive higher levels of mentoring support from senior managers because they are more likely to be seen as competent and trustworthy, important determinants of a mentor's willingness to provide support to a protégé (Singh et al., 2009; De Janasz & Sullivan, 2004; Wang, Tomlinson, & Noe, 2010). As discussed above, we expect the mentor network to be, in turn, related to one's leadership effectiveness and promotability.

Hypothesis 6: Mentor network mediates the relationships of developmental supervision to supervisor ratings of (a) leadership effectiveness and (b) promotability.

We do not predict a three-way interaction among the developmental experiences through mentor network, as a parallel to Hypothesis 4, because we do not expect formal development programs to predict mentor network under any conditions. At the company participating in this study, formal training offered no opportunities to interact with senior managers.

Method

Sample and Procedure

We collected survey data from managers and their supervisors in a large retail organization. The company has approximately 190 stores. Each store has multiple departments, with a store management team composed of a store manager, the department managers, and assistant department managers. Although external hires are occasionally used for management positions, the company is committed to a promotion-from-within policy. They provide a variety of management development programs including formal management skills training, specialized off-site leadership training, and a high potential manager program. A typical management career path would begin as an assistant manager of a department, progress through various department manager positions, and lead eventually to store manager. The focus of our study is on the first-line managers within the retail operations (e.g., the assistant department manager positions) because these managers currently exercise leadership and are the initial source for the talent pipeline that leads to higher-level manager positions.

Through the assistance of a representative from the human resources department, we obtained a list of first-line managers and sent them a survey through the company's internal mail system. This survey included measures for the developmental experiences, leadership self-efficacy, mentor network, potential control variables, and demographics. Our contact person also provided the names of each manager's immediate supervisor so we could obtain supervisors' ratings of the managers' leadership effectiveness and promotability. The supervisor surveys were also sent through the company's internal mail system. We pre-coded all surveys to match individual manager responses to their corresponding supervisor responses. The survey packet included a letter of support from the HR

manager of the company, a postage-paid reply envelope, a letter of informed consent, and the survey itself. Completed surveys were returned directly to the researchers.

The manager survey was distributed to all 439 first-line managers. We received a total of 331 completed surveys, yielding a response rate of 75.4%. Two months later, we distributed the supervisor surveys to the immediate supervisors of those participating managers. We received 235 completed supervisor surveys for a response rate of 71%. This represented 117 unique supervisors as some managers reported to the same supervisor: 44% of the supervisors rated only one manager and on average each supervisor rated 2.01 managers. All of the returned supervisor surveys could be matched to a manager with complete data. Thus, our final sample size is 235 manager-supervisor dyads (for an overall manager response rate of 54%).

To check for supervisor non-response bias, we tested for differences in our manager-reported study variables between the group of focal managers whose supervisors responded and managers whose supervisors did not respond. A MANOVA revealed no significant mean differences ($F = .91$, $n.s.$) in formal development programs, developmental job challenges, developmental supervision, leadership self-efficacy, or mentor network. Of the 235 managers included in the final sample, 67% were male, their average age was 37 years and 83% were married or in a de facto relationship. In terms of highest level of education, 45% had a high school diploma, 19% had an associate's degree, 34% had a bachelor's degree, and 2% had a master's degree. All of these managers were full-time employees and their average job tenure was 3.02 years. The demographic breakdown of the supervisor respondents is as follows: average age was 42 years; 94% were male and 92% were married. In terms of highest-level of education, 44% had a high school diploma, 27% an associate's degree, 26% a bachelor's degree, and 3% a master's degree.

Measures

Formal development programs. We used Kraimer, Seibert, Wayne, Liden, and Bravo's (2006) 4-item measure of participation in formal training and development to assess manager's

participation in formal development programs. Respondents indicated ($1 = \text{not at all}$ to $5 = \text{to a very large extent}$) the extent to which they had participated in four types of developmental activities in the past 12 months: training courses to develop managerial skills, training courses to develop technical/functional skills, career strategy workshops, and educational courses that qualified for tuition reimbursement. The company offers all of these formal programs to their employees. Specifically, the company offers on-line training on safety, customer service, product knowledge, and personal development as well as classroom-based training on selling skills, customer service skills, and leadership behavior. It also supports participation in accredited programs that lead to advanced degrees at partner universities. The four items were averaged to form a composite ($\alpha = .74$).

Developmental job challenges. We assessed developmental job challenges with eight items created for this study based on the Job Challenge Profile (JCP) scale by McCauley, Ohlott, and Rudderman (1999). We did not use the 50-item JCP scale for several reasons: we were not interested in examining subdimensions of the scale, thus, the long length of their scale was not justified; we and our contact person at the company wanted to minimize respondent fatigue in answering an overly long survey; and McCauley et al. (1999) have copyright restrictions that require a per survey fee. To capture a range of job challenges appropriate for first-level managers, we initially developed 10 items, two items each to capture the five dimensions of the JCP scale (McCauley et al., 1999). We provide the 10 items that compose our scale, along with scale validity evidence, in the Appendix. Our developmental job challenges measure (10 item) correlates positively and significantly with the 50-item JCP ($r = .71, p < .01$) and ($r = .69, p < .01$; 8 item discussed below), providing evidence for the construct validity of our measure.

Using data from the full sample of managers who responded to the manager survey ($n = 331$), we conducted a principal axis factor analysis (promax rotation) of the 10 items to assess unidimensionality of the scale. The results revealed two factors: Factor one had an eigenvalue of 3.90 and had eight scale items loading above .44; factor two had an eigenvalue of 1.37 and had two items

loading above .60. All of the cross-loadings were below .20. The two items that significantly loaded on the second factor also had low mean scores and little variability among our respondents suggesting these items were not relevant to the first-line managers in this company. Thus, we dropped those two items from our scale. Respondents indicated the extent to which they experienced the job challenge since starting work at the company on a scale from *1 = not at all* to *5 = a great deal*. Responses to the eight items were averaged to form a composite ($\alpha = .83$).

Developmental supervision. Developmental supervision was assessed from managers with 14 items from the Empowering Leadership Questionnaire (Arnold et al., 2000). Consistent with our definition of developmental supervision, we used only the items measuring the coaching and leading-by-example dimensions. The scale items were re-worded to focus on the individual, rather than the work team. Five items asked respondents to indicate the extent to which their supervisors lead by example (e.g., “sets high standards for his/her own behavior”) and nine items referred to the supervisor’s coaching behavior (e.g., “helps me see areas in which I need more training”). Respondents were instructed to think about how often their supervisor had demonstrated these behaviors over the past 6 months (*1 = never* to *5 = always*). We averaged the 14 items to form a composite score for developmental supervision ($\alpha = .96$).

Leadership self-efficacy. Managers rated their leadership self-efficacy with Ng et al.’s (2008) 11-item scale. Respondents were asked to rate on a scale (*1 = not at all confident* to *5 = very confident*) “how confident are you in your ability to do the following types of tasks?” Two example tasks include “set the overall direction for a project team or work unit” and “motivate others to perform at their best”. Based on our conversations with senior organizational managers, we added an additional item deemed to be an important leadership task for our sample: “deal with day-to-day politics”. Adding this item to the leadership self-efficacy scale did not change the pattern of relationships found between self-efficacy and the other study variables: the six correlations between

the study variables and the original 11-item scale were virtually identical to the correlations obtained using all 12-items. Thus, responses to the 12 items were averaged to form a composite ($\alpha = .94$).

Mentor network. We asked managers to indicate (by initials) people at work with whom they socialize, discuss important work or non-work related matters, and/or who have contributed to their professional development. This broad question was designed to elicit their work-based social network. Based on previous research regarding the size of professional support networks (Marsden, 1990; Seibert et al., 2001), managers were provided with the option to list up to 12 people. For each of the network contacts listed, we then asked three questions specific to mentoring support as defined in the literature (e.g., Kram, 1983; Noe, 1988): “Does this person share personal insights with you, act as a counsellor, and provide you with friendship and support?”, “Does this person open doors for you, provide you with visibility, and help you gain access to opportunities that stretch you professionally?”, and “Do you consider this person to be a mentor for you?” These three questions capture, respectively, psychosocial mentoring support, career mentoring support, and the number of mentors within their work-based network. The first two questions were measured on a scale from 1 = *never* to 5 = *always*. For each of these two questions, we summed the responses across all network contacts to obtain a measure for amount of psychosocial mentoring received (mean was 11.16, range was 0 to 46) and amount of career mentoring received (mean was 9.55, range was 0 to 35). The third question had a “yes” or “no” response option. We added up the total number of “yes” responses to measure number of mentors (mean was 1.94, range was 0 to 9). After standardizing the three scores, we formed a composite measure for mentor network by averaging the scores ($\alpha = .93$). This composite measure thus captures the size of the manager’s mentor network as well as the amount of psychosocial and career mentoring support received from their work-based network.

Leadership effectiveness. We obtained supervisor ratings of managers’ leadership effectiveness in their current job role with the four “effectiveness” items from the Multifactor Leadership Questionnaire (Avolio & Bass, 2004). Two example items are “This manager is effective

in meeting others' job-related needs" and "This manager leads a group and/or projects that are effective". Responses to the four items ($1 = \text{not at all}$ to $5 = \text{frequently if not always}$) were averaged to form a composite ($\alpha = .85$).

Promotability. Supervisors rated the managers' promotability with three items taken from Wayne, Liden, Kraimer, and Graf's (1999) 4-item scale: we dropped one item that had the lowest factor loading in their data due to survey length restrictions by the company. An example item is: "I believe that this manager has what it takes to be promoted to a higher-level position". We averaged responses to the three items ($1 = \text{strongly disagree}$ to $5 = \text{strongly agree}$) to form a composite ($\alpha = .87$).

Control variables. To rule out individual differences in motivation or potential as a leader as alternative explanations for our observed effects, we included several relevant control variables. First, we controlled for the manager's motivation to lead in predicting leadership self-efficacy, leadership effectiveness, and promotability ratings, as research has found leadership motivation to be one of the most important individual difference factors predicting leadership advancement (Bray, 1982; Day, 2012). *Motivation to lead* was measured with Chan and Drasgow's (2001) 5 affective-identity items ($\alpha = .73$) (e.g., "I usually want to be the leader in the teams that I work in") that were validated by Bobbio and Rattazzi (2006). *Age* (self-reported in years) was included as a control predicting mentor network and promotability, because previous research has found that age negatively relates to mentoring support (Finkelstein, Allen, & Rhoton, 2003), as well as promotions and assessments of promotability (e.g., Ng., Eby, Sorensen, & Feldman, 2005; Wayne et al., 1999). Finally, to account for baseline levels of leadership potential, we controlled for whether the manager had already been selected for the company's high potential program prior to our survey administration. Managers selected for the high potential program commence one of three formally designed training programs lasting several months. Our contact person provided us with the list of managers invited to a high potential training program prior to our survey. The *high potential program participant* variable was

coded yes (1) or no (0). We included it as a control predicting mentor network and promotability ratings based on the significant correlations for these relationships. Lastly, we also considered controlling for sex, job tenure, and level of education, but correlations indicated that these three demographic variables did not significantly relate to any of our study variables (see Table 1).

Analyses and Results

Descriptive statistics and correlations for all study variables are provided in Table 1.

Confirmatory Factor Analyses

We first conducted a confirmatory factor analysis (CFA) to demonstrate discriminant validity among our five theoretical constructs collected from the managers. Given the number of scale items (41), we created parcels for any variables measured with more than four items to obtain stable estimates. We used the commonly accepted cut-off values ($CFI > .90$, $RMSEA < .08$, $SRMR < .06$) as indicative of good fit (Dulac, Coyle-Shapiro, Henderson, & Wayne, 2008; Hair, Anderson, Tatham, & Black, 1998; Kelloway, 2015). We then compared our hypothesized 5-factor model to alternative nested models using the χ^2 difference test to determine the best-fitting model (Kelloway, 2015).

The hypothesized model of five correlated latent factors fit the data well ($\chi^2 = 360.32$, $df = 109$, $p < .05$; $CFI = .93$, $RMSEA = .08$, $SRMR = .05$). We first compared our 5-factor model to a 2-factor model consisting of a developmental experiences factor (e.g., formal development programs, job challenge, and developmental supervision as one factor) and a social cognitive and social capital factor (e.g., leadership self-efficacy and mentor network as a second factor). The 5-factor model fit significantly better than the 2-factor model ($\Delta\chi^2 = +121.89$, $\Delta df = 4$, $p < .05$; $CFI = .90$, $RMSEA = .10$, $SRMR = .49$). We then compared the 5-factor model to all possible, nested, 4-factor models and the 5-factor model was superior in all cases ($\Delta\chi^2$ ranged from +51.41 to +131.69, $\Delta df = 1$, $p < .05$). Overall, these results provide evidence that our five variables measured distinct theoretical constructs.

To assess the extent to which common method variance (CMV) was a concern, we ran a second CFA specifying the five theoretical construct (e.g., trait) latent factors and a sixth CMV latent factor (e.g., Podsakoff, MacKenzie, Lee, & Podsakoff, 2003). CMV loadings were specified for items in all of the scales, but not for every item in every scale as such a model produces unidentifiable solutions (Spector & Brannick, 2009). Our measurement plus methods factor model converged with the following fit statistics ($\chi^2 = 165.49$, $df = 96$, $p < .05$; CFI = .98; RMSEA = .05; SRMR = .05). Although three of the scale items had a significant loading ($p < .05$) on the common method factor, in all cases the items loaded significantly on the theoretical trait factor and the standardized trait factor loading was at least twice the magnitude of the loading with the common method factor. Most importantly, we found that the theoretical trait factors explained 63.4% of the variance in our scale items *and the method factor explained only 3.8% of the variance*, well below the 50% cut-off that is suggested as indicating the presence of a single substantive factor (Hair et al., 1998). These results therefore suggest that CMV is not a significant source of the relationships among the theoretical variables in our model.

Lastly, we conducted a CFA of the leadership effectiveness and promotability scale items rated by the supervisors. The 2-factor model in which the seven items are loaded only on their hypothesized factor and the two factors are allowed to correlate fit the data very well ($\chi^2 = 13.22$, $df = 13$, $p < .05$; CFI = 1.00; RMSEA = .01; SRMR = .03). Importantly, the 2-factor model fit significantly better than a 1-factor model ($\Delta\chi^2 = +12.84$, $\Delta df = 1$, $p < .05$), providing support for the discriminant validity of the two leadership outcomes.

Hypothesis Testing

Because managers are nested within supervisors, we calculated ICC(1) and design effect scores to determine if there was significant variability in our dependent variables based on supervisor groupings (Bliese & Hanges, 2004; Kline, 2011). These authors have suggested that failure to model group-level effects may overestimate standard errors when testing level-1 relationships, and thus introduce Type II error. The loss of power may be substantial when ICC(1) scores are greater than .15

and/or design effects are substantially larger than 1.0 (Bliese & Hanges, 2004; Kline, 2011). In our data, $ICC(1) = .03$ and the design effect = 1.03 for leadership effectiveness ratings. For promotability ratings, $ICC(1) = .16$ and the design effect = 1.16. As the ICC for promotability exceeds the cut-off level suggesting standard errors may be overestimated due to non-independence in supervisor ratings, we tested our hypothesized model incorporating “supervisor” as a Level 2 clustering variable. We note that the results are substantively the same when testing the hypotheses with or without modeling supervisor as a Level 2 clustering variable.

We ran two separate analyses to test our six hypotheses. Hypotheses 1-3, 5 and 6 were tested simultaneously with Multilevel Structural Equation Modeling (SEM) in MPLUS. SEM is appropriate for testing models with multiple mediators and/or outcome variables, as it is a full information estimation technique that accounts for the relationships among all the variables (Kelloway, 2015). The MPLUS program allows testing structural models at the individual-level while specifying a cluster variable (i.e., supervisor) at Level 2. Because existing research provides little guidance for incorporating three-way interactions within SEM (e.g., Cortina, Chen, & Dunlap, 2001), we used the PROCESS macro for SPSS (Hayes, 2012) to test the conditional indirect effect of participation in formal development programs to the two outcomes via leadership self-efficacy as specified in Hypothesis 4.

Multilevel SEM analysis. For this analysis, we used MLR estimation, as it is more robust to violations of multivariate normality (Kelloway, 2015), and conducted a two-level analysis specifying supervisor as the clustering variable. All paths were estimated within groups (i.e., at the individual-level). So that the fit of the structural model would not be confounded with the fit of the measurement model, we used single-score indicators to measure the latent variables (Anderson & Gerbing, 1988). In doing so, the path from the latent variable to the indicator was set equal to one and appropriate adjustments for measurement error were entered (Williams & Hazer, 1986). In addition, supervisors’ ratings of leadership effectiveness and promotability were allowed to correlate. We compared the

hypothesized mediated model to a partially-mediated model, as it is theoretically plausible that relationships may be direct (unmediated) or mediated by constructs not included in the model (Kelloway, 2015). The Satorra-Bentler Scaled Chi-square difference test was used to determine the best-fitting model as the two models are nested.

Our hypothesized mediated model fit the data very well ($\chi^2 = 36.40$, $df = 19$, $p < .05$; CFI = .96; RMSEA = .06; SRMR = .04). We then compared this model to the partially-mediated model such that, in addition to our hypothesized paths, all the direct paths from the developmental experience variables to leadership effectiveness and promotability ratings were estimated. The chi-square difference test suggested that the partially-mediated model did not fit significantly better than the mediated model ($\Delta\chi^2 = -6.18$, $\Delta df = 6$, $p > .05$). We thus retained the hypothesized model as the most parsimonious best-fitting model (see Figure 1) to test Hypotheses 1-3, 5 and 6.

Hypotheses 1-3 predicted that leadership self-efficacy would mediate the relationships between the three developmental experiences and two leadership outcomes. With respect to Hypothesis 1, the indirect effect from formal development programs to leadership effectiveness ($\beta = .02$, $p > .05$) and to promotability ($\beta = .03$, $p > .05$) through leadership self-efficacy failed to reach significance. Examination of the path estimates (see Figure 1) shows that leadership self-efficacy had a statistically significant relationship with leadership effectiveness ($\beta = .22$, $p < .01$) and promotability ($\beta = .28$, $p < .01$), but the path estimate from formal development programs to leadership self-efficacy was not statistically significant ($\beta = .10$, $p > .05$). Thus, Hypothesis 1 is not supported. Hypothesis 2, however, was fully supported: the positive indirect path estimates from job challenges to (a) leadership effectiveness ($\beta = .05$, $p < .05$) and (b) promotability ($\beta = .06$, $p < .05$) via leadership self-efficacy were statistically significant. Finally, Hypothesis 3 was not supported: the indirect effects from developmental supervision to leadership effectiveness or promotability, via self-efficacy ($\beta = .01$ and $.01$, respectively, $p > .05$) failed to reach significance. Examination of Figure 1 shows the path estimate from developmental supervision to leadership-self-efficacy was not statistically significant (β

$= .03, p > .05$).

Hypotheses 5 and 6 predicted that managers' mentor network would mediate the relationships between developmental job challenges (H5) and both outcomes, and between developmental supervision (H6) and both outcomes. Although both developmental job challenges and developmental supervision are significantly related to the size and quality of the mentor network ($\beta = .23, p < .01$ and $\beta = .20, p < .05$, respectively), the parameter estimate from the mentor network to leadership effectiveness was not statistically significant ($\beta = .11, p > .05$), rendering the indirect effect for both non-significant ($\beta = .03, p > .05$ and $\beta = .02, p > .05$, respectively). Thus, Hypothesis 5a and Hypothesis 6a are not supported. With respect to H5b, developmental job challenges had a significant indirect effect on promotability via mentor network ($\beta = .04, p < .05$), supporting Hypothesis 5b. Finally, the indirect effect of developmental supervision to promotability ratings via mentor network did not quite reach statistical significance ($\beta = .03, p = .10$). Thus, Hypothesis 6b was not supported.

Finally, consistent with recommendations by Spector and Brannick (2011), we re-ran our hypothesized model without the control variable paths estimated to rule-out the possibility that our results can be attributed to the control variables. In this "no control variables" model, the significance of the indirect effects are consistent with the results when including control variables, with the one exception being that the indirect effect from developmental supervision to promotability via mentor network (H6b) was significant in this model ($\beta = .04, p < .05$). Without the control variable paths estimated, our model explains 24% of the variance in leadership self-efficacy, 11% in mentor network, 7% in ratings of leadership effectiveness, and 15% in ratings of promotability.

Test of conditional indirect effects. Hypothesis 4 predicted that the indirect effect of formal development programs on (a) leadership effectiveness and (b) promotability via leadership self-efficacy would be stronger at low levels of both developmental job challenges and developmental supervision. As noted above, leadership self-efficacy significantly related to both outcomes, suggesting mediation is possible (see Figure 1). A moderated regression analysis also found that the

3-way interaction significantly predicted leadership self-efficacy ($b = .17, p < .05$). To test the indirect effects, we used the PROCESS macro for SPSS (Hayes, 2012; Preacher & Hayes, 2008). We used 5000 resampling iterations to generate 95% bias corrected bootstrap confidence intervals around the conditional indirect effects via leadership self-efficacy, with manager's motivation to lead, age, and nomination to the high potential program included as covariates. The results of the analysis are summarized in Table 2.

Supporting Hypothesis 4a, the indirect effect of formal development programs on leadership effectiveness via leadership self-efficacy was significant when there were low levels of both developmental job challenges and developmental supervision ($B = .06, SE = .04, 95\% CI$ ranged from .0050 to .1517). Likewise, in support of Hypothesis 4b, there was a significant indirect effect of formal development programs on promotability via leadership self-efficacy when there were low levels of both developmental job challenges and supervision ($B = .13, SE = .07, 95\% CI$ ranged from .0125 to .2869). Unexpectedly, there was also a significant indirect effect of formal development on leadership effectiveness ($B = .03, SE = .02, 95\% CI$ ranged from .0036 to .0847) and promotability ($B = .06, SE = .04, 95\% CI$ ranged from .0097 to .1589), via leadership self-efficacy, at *high* levels of both developmental job challenges and developmental supervision. We revisit this finding in the Discussion.

We also probed for the nature of the 3-way interaction effect on leadership self-efficacy by plotting the simple slopes for the effects of participation in formal developmental programs on leadership self-efficacy at low (1 standard deviation below the mean) and high (1 standard deviation above the mean) levels of developmental job challenge, separately for low and high levels of developmental supervision (Aiken & West, 1991). As shown in Figure 2, participation in formal developmental programs positively related to leadership self-efficacy ($\beta = .25, p < .01$) at low levels of both developmental job challenge and developmental supervision¹. Taken together, these results support Hypotheses 4a and 4b. In addition, formal development was positively related to leadership

self-efficacy at high levels of both developmental job challenge and developmental supervision ($\beta = .13, p < .05$).

In sum, we found support for Hypotheses 2a, 2b, 4a, 4b, and 5b. Hypothesis 6b was also supported in the model when control variables were not included.

Discussion

Fifteen years ago, Day (2000) argued that a full understanding of the way managers become effective leaders would require theoretical attention to both human and social capital. To our knowledge, we offer the first empirical test of a model that integrates multiple sources of development with both individual and interpersonal mediating processes to explain how developmental experiences relate to leader effectiveness and promotability. Consistent with social cognitive and social capital theories, we found that developmental job challenges relate to leadership effectiveness and promotability indirectly through leadership self-efficacy and one's mentor network. Our findings also support the idea that leadership self-efficacy mediates the relationship between formal development programs and leadership capacity, but only when leaders experience either low levels of both developmental job challenges and developmental supervision, or high levels of both. Taken together, our results contribute to our theoretical understanding of how and why developmental experiences nurture the development of more effective and promotable leaders.

Theoretical Implications

Our study makes several important contributions to the literature on leadership development. First, our work extends existing understanding of the processes and outcomes associated with leadership development activity. As we noted earlier, the underlying theoretical mechanisms that explain how developmental practices and experiences relate to leader effectiveness and promotability are not well understood. Based on social cognitive and social capital theories, we proposed that developmental experiences supply psychological (i.e., confidence in one's leadership capabilities) and

social (a network of mentors who offer support and career advice) resources that enable leaders to be more effective in their roles. Our results demonstrate that both mediating processes are important, although the results for leadership self-efficacy were more robust.

Specifically, both developmental job challenges and the conditional effect of formal development programs (when both developmental job challenges and developmental supervision were low or both were high) were mediated through leadership self-efficacy. One previous study (Aryee & Chu, 2012) has linked challenging job experiences to job self-efficacy and task performance, but that study was with non-supervisory employees. Our study extends the social-cognitive perspective to the domain of leadership development and effectiveness. Our results suggest that challenging on-the-job experiences enhance leadership capacity partly by building leaders' belief in their ability to perform successfully in a leadership role. In addition, self-efficacy acts as a motivational mechanism, enhancing effort, persistence in the face of obstacles, and the willingness to take on new and more challenging leadership tasks and responsibilities. Leadership self-efficacy is a construct that has taken on growing importance in the literature, and our work shows that it is an important mechanism in the leadership development process linked to specific development experiences.

Our findings regarding the mentor network as a mediating mechanism were less robust than we expected. Although both developmental job challenges and developmental supervision were related to the quality of one's mentor network, only the indirect effect from job challenges through mentor network to promotability reached statistical significance. Nevertheless, these findings broaden our theoretical understanding of the interpersonal processes that underlie leadership development. Specifically, our results suggest that challenging job assignments and developmental supervisors enable leaders to develop higher quality networks of supportive mentors within the organization. A network of mentors can provide visibility and exposure that enhances the leader's potential for promotion into positions of greater leadership responsibility. Even though the size of the indirect effect was small, the cumulative effects of this network advantage can be substantively important over

time, leading to more promotions, higher salary, and greater career success (Seibert et al., 2001). At the same time, our results extend the growing literature on social networks and leadership (Kilduff & Krackhardt, 2008). Network properties have been related to a number of processes central to effective leadership, including the accumulation of power and influence (e.g., Brass & Burkhardt, 1992, 1993), a positive reputation for leadership, (Balkundi et al., 2011; Kilduff & Krackhardt, 1994; Mehra et al., 2006), and the ability to establish effective working relationships with subordinates (Sparrowe & Liden, 2005; Venkataramani et al., 2010). Much less attention has been devoted to the antecedents of social networks in organizations (Kilduff & Krackhardt, 2008). Although our results are based on cross-sectional data, they suggest that developmental experiences may shape one's social network, helping nascent leaders establish relationships beyond their immediate work group to gain support in the larger organization.

A second way we contribute to the leadership development literature is by examining the three sources of developmental experience—formal development, job challenges, and developmental supervision—together in a single model. Although each of these developmental experiences has been previously examined separately, our results suggest it is necessary to examine them together to have a correctly specified estimate of their effects. Most notably, formal development positively related to both leadership effectiveness and promotability indirectly via leadership self-efficacy when the manager experienced low levels of on-the-job development. This result is consistent with the notion that learning which takes place either within the context of one's work role or from one's immediate supervisor may nullify the effects of learning through formal methods, yet, in the absence of these informal learning experiences, participating in formal development programs can positively contribute to leadership capacity by raising one's self-efficacy beliefs.

Our unexpected finding that participation in formal development programs related positively to leadership capacity indirectly via leadership self-efficacy when leaders also experienced *high* levels of both developmental job challenges and developmental supervision suggests that a synergistic effect

may occur when high levels of all three sources of development are experienced together. That is, formal training may also be beneficial when coupled with both high job challenges and a developmental supervisor. Presumably, this is because each developmental experience provides unique types of information, feedback, or support that enhances the learning one derives from the other two sources of development. For example, formal training provides information and conceptual tools one can use to generate more varied and more effective behavioral patterns, while developmental job challenges provide the opportunity to practice these behaviors and developmental supervision provides encouragement to experiment and feedback to better reflect upon and learn from those experiences. Indeed, accurate feedback about the cause and effect relationship while dealing with challenging work assignments increases the probability of self-correction and is likely to trigger a positive efficacy-leadership effectiveness spiral (Lindsley, Brass & Thomas, 1995). Taken together, our synergistic interaction findings suggest that, although any isolated leadership development activities can be effective, the use of these three leadership development activities together simultaneously is likely to be most effective.

A third contribution to the leadership development literature is our finding that developmental job challenge has a positive indirect effect on leadership effectiveness (through leadership self-efficacy). Previous researchers have shown developmental challenge to be related to self-perceived learning (McCauley et al., 1994), supervisor-rated managerial competency or skill development (DeRue & Wellman, 2009; Dragoni et al., 2009), but these outcomes are leadership skills that are thought to relate to leadership effectiveness, not leadership effectiveness itself. We are aware of no research that links the experience of developmental job challenge to supervisor's ratings of leadership effectiveness in one's current leadership role, as we do here. Thus, our findings extend the work on developmental job challenge to arguably the most important outcomes in the leadership literature.

Practical Implications

Our results have important implications for leadership programs in organizations and individuals seeking to become leaders. In particular, the results suggest that combinations or bundles of developmental experiences can have supplemental and synergistic effects. Formal training, challenging job responsibilities and developmental supervision together will have the greatest potential consequences for developing leaders. However, if few informal development experiences are available, then formal training by itself can build new leaders' confidence and prepare them for future challenges.

On their own, informal, on-the-job development experiences are more important than formal development programs, such as training classes. Through developmental job challenges, managers may build their leadership self-efficacy and expanded their mentor network, all of which contributed to supervisors' assessments of their promotability. Job challenges include such responsibilities as executing a new strategy within one's work unit and dealing with difficult personnel problems. Organizations may thus want to incorporate such responsibilities into a promising manager's job duties and managers should seek them out even if they are not offered. Further, when organizations seek to fill leadership positions, they should consider the way a particular assignment will help to develop the leadership capacity of the individual assigned. The other informal developmental experience examined here, developmental supervision, positively related to the manager's network of supportive relationships. Thus, organizations should also train their supervisors to engage in role-modeling (e.g., setting a positive example with their own leader behavior), and in coaching behavior (e.g., challenging thinking and assumptions, driving results, and creating accountability for goals). To truly embed these activities, it may be crucial to make them part of senior managers' key performance indicators. Likewise, individuals interested in becoming leaders should seek out developmental supervision from their managers. Initiating developmental discussions with their supervisors may also help junior managers establish mentor-protégé relationships with others more senior in the organization.

Knowing key senior managers and having interpersonal sources of support can help leaders have influence and impact in the organization (Balkundi et al., 2011; Kilduff & Krackhardt, 1994; Mehra et al., 2006). It is therefore important for lower-level managers to build a network of senior managers within the organization who are willing to mentor them. Our results suggest that developmental job challenges and developmental supervisors are likely to help leaders build this type of social capital. Although the formal development programs that we examined were not associated with better mentor networks, programs that incorporate senior managers as trainers may facilitate network development in a way similar to organizational socialization tactics that incorporate this serial feature (Van Maanen & Schein, 1979). In addition, this type of social capital is likely to be ‘sticky’ in the sense that it may bind employees to the organization because it does not easily transfer to a new organization. Thus, the company is likely to benefit from this kind of human resource development investment in three ways: first, through the improved leadership potential of its employees, second through greater retention of the employees in which they have made investments, and third by creating a more effective network of senior manager and mentors throughout the organization.

Strengths, Limitations, and Future Research

A strength of our study is that we collected data from two sources, focal managers and their immediate supervisors. This helped minimize common source bias as an explanation of the relationship between the mediators and outcomes. In addition, the use of theoretically grounded constructs allowed us to better distinguish between the manager’s leadership capabilities (e.g., self-rated leadership self-efficacy) and performance in the leadership role (e.g., supervisor-rated leadership effectiveness). Collecting data from a single organization also helped us control for confounding factors that may be due to organizational or industry differences, such as differing promotion and retention rates or the organization’s talent pool. A final strength of the study is that we developed and validated a shorter, 10-item scale to measure developmental job challenges that can be used in future academic research.

However, these strengths should be considered in light of some limitations. One limitation is potential common method bias and an inability to draw strict causal conclusions. These problems arise because we collected the data to measure the developmental experiences, leadership self-efficacy, and mentor network from the same source at the same time. To minimize these concerns, we asked respondents to report the extent to which they engaged in the developmental experiences in the past, but to report their current levels of self-efficacy and their current mentor network, although we recognize the current network may have been established earlier in time. To more directly address the causality issue, we tested an SEM model switching the roles of the developmental experiences and our hypothesized mediators, such that leadership self-efficacy and mentor network predicted the three developmental experiences, which in turn predicted the two leader outcomes. This model had poor fit ($\chi^2 = 85.16$, $df = 19$, $p < .05$; CFI = .85; RMSEA = .11; SRMR = .08) and did not support the proposition that developmental experiences mediate between leadership self-efficacy (mentor network) and leadership effectiveness and promotability because none of the parameter estimates among the developmental experiences and the leadership outcomes were statistically significant. Although this does not rule out the possibility that mentor networks and leadership self-efficacy may lead to more participation in developmental experiences, the results of this reverse-causal model do support our proposition that self-efficacy and mentor network are the more proximal variables predicting leadership effectiveness and promotability. Future research may consider using a longitudinal research design to examine changes in leadership skills and changes in leader effectiveness. We also tested for the effect of common method variance and found little evidence that this should be considered a major concern for our study. Finally, we also included two control variables to test for a major alternative explanation that the initial ability or leadership motivation of the manager explained our effects, and not the development practices. We found support for our hypothesized model even after controlling for perceived potential of the manager, as indicated by his/her nomination to the high potential program and his/her motivation to take on leadership responsibilities.

A second limitation is that the focus only on first-line managers in a single retail organization may mean that our results may not generalize to other management levels or firms. Thus, future research should examine these relationships using samples from different sectors. A third limitation is that we did not measure whether, or to what extent, the formal development programs included the four self-efficacy enhancing processes—enactive mastery, role-modeling, social persuasion, and emotions management—identified by social cognitive theory. Nor did our measure focus exclusively on leadership training, but instead, captured a range of developmental programs including technical skills training and educational courses. Both of these measurement deficiencies may explain why Hypothesis 1 was not supported. We encourage future research to examine the social cognitive explanation for why formal leadership development should be related to leadership self-efficacy by focusing more specifically on leadership training and to measure the self-efficacy enhancing processes of the training program. However, it is noteworthy that, in combination with the two other development experiences, formal development programs positively related to leadership self-efficacy, and indirectly to leadership effectiveness and promotability.

Finally, although not examined here, there may be moderating factors that condition the beneficial (or even create detrimental) effects of job challenges on outcomes (e.g., Courtright et al., 2014; Dong et al., 2014). For example, it is possible that successfully meeting (or not meeting) developmental challenges is one moderator that will determine whether exposure to job challenges nurtures or hinders the development of leadership self-efficacy. Indeed, leaders who do not successfully navigate the developmental challenges they are exposed to may feel less confident in their ability to deal with leadership challenges. Thus, exploring the moderating role of successful handling of job challenges would be one way for future researchers to extend our findings.

Conclusion

Our study answers calls for more theoretically integrative research on the process of building managers' leadership capacity (Avolio, 2007). Our model helps to establish a stronger evidence-based

understanding of the types of developmental experiences that relate to leadership effectiveness and promotability and uncovers two mediating mechanisms—leadership self-efficacy and the size and quality of one's mentor network—to explain these relationships. We hope to forge stronger links between the leadership development, social cognitive, and social capital literatures, and provide human resource practitioners with direction on ways to cultivate leadership talent in their organizations.

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Footnote

¹ In order to examine the relative strength of each developmental experience on the outcome variables, we calculated the conditional indirect effect for each developmental experience when the other two developmental experiences are low, the condition in which each source of development has its strongest effect. Our results show that developmental job challenges has

the strongest conditional indirect effect, followed by formal development programs. Full results are available from the first author.

Appendix

Job Challenge Scale Validity Study

We collected data through an Australian commercial national panel of survey volunteers to assess the validity of our developmental job challenges scale. Past studies have used similar firms to recruit participants (e.g., Long, Bendersky, & Morrill, 2011; Montes & Zweig, 2009). The firm sent solicitations calling for panelists who were 18 years of age or over and currently employed in supervisory positions. Two hundred and twenty-seven panelists clicked into the survey. We screened out 25 respondents who left the survey without completing any items. We removed an additional 35 respondents with a clear pattern of insufficient effort responding (e.g., selected 5 for all items), leaving a useable sample of 167 (73% response rate). Sixty-five percent of respondents were male and average age was 36.6 years ($SD = 10.96$ years). Our survey included the job challenge profile (McCauley et al., 1999), and other study constructs (leadership self-efficacy, formal development programs, developmental supervision, and motivation to lead). Table A1 lists the items and Table A2 shows the results from this validity study. Both the 10-item and 8-item versions of the job challenge scale developed for this study are strongly correlated with McCauley et al.'s (1999) job challenge profile scale ($r = .71, p < .01$ and $r = .69, p < .01$, respectively). In addition, all three scales show a similar pattern of correlation with the other variables in the study.

Table A1**Developmental Job Challenges Scale Items**

Item
1. I have been required to work with a product, market, or technology I have not worked with before.
2. I have been required to use technical or functional skills, for which I lacked previous training or experience.
3. I was made responsible for executing a significant change, such as a new strategy, a re-organization, or a turn-around, in an organizational unit
4. I have been made responsible for instituting new policies, procedures, systems or technology in an organizational unit.
5. I have had to handle significant managerial problems with my team members for the first time.
6. I have had to deal with significant performance problems among key members of my staff.
7. I have been given significant managerial responsibility.
8. I have been given direct responsibility for an entire project, product, service, function, or other identifiable unit of this magnitude.
9. I have had to exert influence over peers or superiors over whom I have no direct authority in order to achieve my work objectives.
10. I have had to manage relations with external constituencies, such as clients, customers, suppliers, or government agencies.
<i>Note.</i> Items in boldface were dropped from the scale used in this study.

Table A2**Means, Standard Deviations, Correlations, and Reliabilities for Validity Study Variables**

	M	SD	1	2	3	4	5	6	7
1. Developmental job challenges (10-	3.30	.69	(.87)						

	item)								
2.	Developmental job challenges (8-item)	3.29	.69	.98**		(.83)			
3.	McCauley et al.'s (1999) job challenge profile	3.11	.80	.71**	.69**	(.98)			
4.	Leadership self-efficacy	3.67	.70	.32**	.31**	.35**	(.91)		
5.	Developmental supervision	3.57	.74	.19*	.17*	.22**	.45**	(.93)	
6.	Formal development programs	3.18	1.01	.44**	.46**	.60**	.24**	.50**	(.90)
7.	Motivation to lead	3.53	.63	.44**	.44**	.37**	.42**	.54**	.51**(.64)

Note. $n = 167$. Alpha reliabilities are given in parentheses. $**p < .01$

Table 1

Descriptive Statistics and Correlations

	M	SD	1	2	3	4	5	6	7	8	9	10	11
1. Leadership Effectiveness ratings	3.78	.67	(.85)										
2. Promotability ratings	3.88	1.03	.68*	(.87)									
3. Leadership self-efficacy	4.21	.56	.20*	.27*	(.94)								
4. Mentor network	.00	.94	.12	.20*	.07	(.93)							
5. Formal development programs	2.99	.79	-.04	.05	.19*	.16*	(.74)						
6. Developmental job	3.55	.67	.04	.09	.39**	.24**	.14*	(.83)					

	challenges													
7.	Developmental supervision	3.78	.79	.01	.03	.14*	.19**	.25*	.03	(.96)				
8.	Motivation to lead	3.85	.55	.14*	.19**	.41**	.16*	.11	.36**	.17*	(.74)			
9.	Age	37.07	8.15	-.07	-.23**	.08	-.09	-.16*	-.14*	.02	.07	-		
10.	High potential program participant											-		
		.19	.39	.10	.14*	.04	.16*	.13*	.15*	-.01	.11	.01	-	
11.	Sex	.67	.47	-.04	-.01	-.10	-.09	-.04	-.04	-.02	.08	.01	.00	-
12.	Job tenure	2.88	3.02	-.03	-.06	.06	.01	.00	-.02	-.09	.04	.04	.08	.10

Note. $n = 235$. Alpha reliabilities are given in parentheses. Sex (0 = female; 1 = male). Supervisors provided ratings of leadership effectiveness and promotability.

* $p < .05$; ** $p < .01$.

Table 2

Conditional Indirect Effects of Formal Development Programs on Leadership Effectiveness and Promotability through Leadership Self-Efficacy

	Dependent Variable

Moderator Level		<i>IE (B)</i>	<i>SE</i>	<i>CI</i>	<i>IE (B)</i>	<i>SE</i>	<i>CI</i>
Developmental Job Challenges	Developmental Supervision	Leadership Effectiveness			Promotability		
Low	Low	.06	.04	.0050 to .1517	.13	.07	.0125 to .2869
Low	High	.01	.02	-.0346 to .0627	.02	.05	-.0765 to .1140
High	Low	-.00	.02	-.0638 to .0325	-.01	.05	-.1263 to .0619
High	High	.03	.02	.0036 to .0847	.06	.04	.0097 to .1589

Note: IE = indirect effect (unstandardized); SE = standard error; CI = confidence interval.

Figure 1

Results for Hypothesized Model^a

^a Completely standardized path estimates are shown from the model including “supervisor” as a Level 2 variable. For the sake of clarity, only the significant paths for the control variables are shown; N=235.

* $p < .05$;

** $p < .01$.

Figure 2

Three-Way Interaction Among Formal Development Programs, Developmental Job Challenges, and Developmental Supervision Predicting Leadership Self-Efficacy

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