

# Why and when leadership training predicts effectiveness: The role of leader identity and leadership experience

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# Why and when leadership training predicts effectiveness

## The role of leader identity and leadership experience

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### Abstract

**Purpose** – The purpose of this paper is to build and test an integrative model of leader identity as an important mechanism explaining why reactions to leadership training associate with leader effectiveness. It is proposed that this mediation relationship is conditional on leadership experience (i.e. time in a formal managerial role), such that it will be weaker for more experienced leaders because they already possess complex leadership-related knowledge and skills.

**Design/methodology/approach** – Hypotheses were tested using a sample of German managers ( $n = 196$ ) in formal leadership positions (i.e. with direct subordinates) across a range of industries. Data were collected using online questionnaires. The proposed first-stage mediation model was tested using the structural equation approach.

**Findings** – Leader identity was found to mediate the relationship between reactions to leadership training and leader effectiveness. This mediation was conditional upon leadership experience, such that the indirect effect only held for less, but not for more, experienced leaders.

**Research limitations/implications** – The findings should be interpreted with caution because all data are self-report and cross-sectional.

**Practical implications** – Leadership training for senior leaders should qualitatively differ (in terms of content and length) from that for novice leaders.

**Originality/value** – Leadership training can substantially improve managers' ability to lead effectively. The present study is the first to establish leader identity as a motivational mechanism that explains this relationship. This is also the first study to test for the role of leadership experience in leader development.

**Keywords** Leader effectiveness, Leader identity, Leadership training, Moderated mediation model

**Paper type** Research paper

A key question in organizational science and practice is: What does it take to foster leadership effectiveness? One answer given is that leaders can become more effective by undergoing training (Day *et al.*, 2014). Indeed, meta-analytical evidence shows that leadership interventions have an overall positive effect on behavioral and performance outcomes ( $d = 0.48$ ) (Avolio *et al.*, 2009). Leadership training also has a positive effect on leader effectiveness (conceptualized as a behavioral means to facilitate follower task performance; Day and Sin, 2011). Still, although much empirical evidence speaks to an overall positive main effect, our understanding of why and when leadership training results in greater leader effectiveness remains limited, and scholars, accordingly, have called for greater attention to mediating processes and moderating factors (Avolio *et al.*, 2009). In response, we advance the idea that leader identity serves as an important mechanism explaining the relationship between reactions to leadership training (i.e. how participants evaluate and feel about the training) and leader effectiveness. We also examine the extent to which leadership experience moderates the relationship between reactions to leadership training, leader identity, and effectiveness.

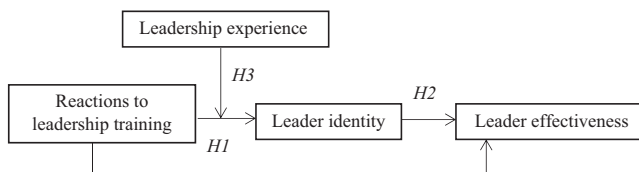


Previous studies assessed how leader identity and/or leader effectiveness change in response to leadership training (e.g. Waldman *et al.*, 2013; Rappe and Zwick, 2007). To complement these within-person studies, we assess in how far between-person differences in reactions to leadership training associate with leader effectiveness, and whether and how leader identity and leadership experience affect this relationship. This is important because within-person and between-person research may yield different and sometimes even contradictory findings (Molenaar and Campbell, 2009).

We conceptualize leader identity as an individual’s self-perception as a leader related to a particular social role (i.e. leadership role; Stryker and Burke, 2000). Social roles convey socially constructed and negotiated expectations of appropriate behavior. The greater the alignment between these role expectations and an individual’s leader identity (i.e. who I think I am as a leader), the stronger the leader identity (Hall, 2004). Along with other individual differences (such as personality traits; Hoffman *et al.*, 2011; Judge *et al.*, 2002), leader identity is an important antecedent to leader effectiveness because it motivates and facilitates leadership behavior (Day *et al.*, 2009; Day and Dragoni, 2015). Empirical evidence suggests that leader identity is positively influenced by training and is related to leader effectiveness (Day and Sin, 2011; Muir, 2014). Extending this line of research, we argue that leader identity serves as a mediator of the relationship between reactions to leadership training and leader effectiveness. Note that trainee reactions describe subjective evaluations of learners about their training experiences (Kirkpatrick, 1976) involving both affective and attitudinal reactions to training (Saks and Burke, 2012). Those reactions are multidimensional in that they capture perceived liking, utility, and learning (Brown, 2005).

Additionally, we propose leadership experience to moderate the relationship between reactions to leadership training, leader identity, and effectiveness. This is because more experienced leaders are likely to have developed a more complex identity in terms of knowledge, skills, and abilities (KSAs) required for the leadership role (Lord and Hall, 2005; Day and Harrison, 2007). Although scholars have acknowledged the importance of experience-related differences in leader development (McCall, 2004), we are not aware of any research studies into the moderating role of leadership experience. Figure 1 depicts the study model.

Our contribution to the extant literature is threefold. First, we propose and test leader identity as a motivational mechanism that explains the relationship between reactions to leadership training and leader effectiveness. In doing so, we respond to recent calls to study more proximal indicators of leadership development including self-views (Day and Dragoni, 2015). Second, we investigate the role of leadership experience as a moderator to these relationships. There is little empirical research into the contextual influence of leadership experience *vis-à-vis* leadership outcomes. Third, previous literature has investigated the relationship between leader identity and leader effectiveness predominantly using samples of students who often lack leadership experience (Day and Sin, 2011; Miscenko *et al.*, 2017). Our study investigates leader identity and effectiveness in a diverse sample of managers holding formal leadership positions (see Johnson *et al.*, 2012).



**Figure 1.**  
Study model

## Hypotheses development

### *Leader identity and effectiveness*

Leader identity is defined as “the sub-component of one’s identity that relates to being a leader or how one thinks of oneself as a leader” (Day and Harrison, 2007, p. 365). Following the identity theory (Stryker and Burke, 2000), leader identity is defined by the leadership role that an individual occupies (Gecas, 1982). The strength of one’s self-perception as a leader depends on the perceived alignment between the leadership role and one’s identity. That is, individuals assess the extent to which their leader identity aligns with the expectations associated with the leadership role – greater alignment strengthens self-perception as a leader (Zheng and Muir, 2015). In addition, leader identity is a cognitive schema that stores and organizes information (i.e. knowledge, skills, experience) attached to a leadership role (Kihlstrom *et al.*, 2003) and directs individual behavior and interactions with others in one’s role.

Theorists suggest that observable, behavioral levels of leadership competence (i.e. effectiveness) are supported by deeper-level mental structures, such as leader identity (Day *et al.*, 2009). We expect leader identity to positively associate with leader effectiveness because leader identity motivates leadership behavior (Day and Sin, 2011; Fiske, 1992). Identity guides individual behavior and, as a knowledge structure, provides information about skills and competencies underlying these behaviors. Thus, holding a stronger leader identity will relate to greater leader effectiveness. Indeed, research finds leader identity to positively associate with perceived leader effectiveness among higher-level managers (Johnson *et al.*, 2012) and other-rated leader effectiveness among university students (Day and Sin, 2011). Finally, the motivational effects of leader identity might also spill-over to followers, in that leader identity shapes followers’ behaviors (Hewapathirana, 2012). For example, leader identity motivates leaders to form high-quality relationships with their followers (Jackson and Johnson, 2012; Chang and Johnson, 2010), which were linked to leader effectiveness (Dulebohn *et al.*, 2012).

### *Reaction to leadership training and identity*

Participation in leadership training may strengthen one’s leader identity because training helps to clarify role expectations and prompts individuals to reflect on their identity. Leadership trainings often include examples of leadership behaviors, meant to highlight leader role expectations. As participants reflect and compare their identity against these role expectations, training may well promote greater alignment between a role and identity, leading to stronger leader identity. Indeed, research findings support the relationship between leadership training and identity, both in student samples (e.g. Waldman *et al.*, 2013; Miscenko *et al.*, 2017) and among professionals (Rappe and Zwick, 2007; Andersson, 2012).

Extending this line of research, we propose that reaction to leadership training will be positively related to the strength of leader identity. Affect research suggests that participants experiencing higher positive affect are more engaged in training (Ainley *et al.*, 2002), which is why we expect that positive reactions to leadership training will facilitate trainee’s engagement with self-reflection and role-identity alignment, which will strengthen their leader identity[1]. Thus, we suggest the following hypothesis:

*H1.* Reactions to leadership training are positively related to leader identity.

### *The mediating role of leader identity*

Affect research suggests that positive affect leads to higher motivation (Brown, 2005). People are motivated to sustain a positive affective state, thus they strive to continue thinking about or engaging in what they believe created the state (Isen, 1984). Since leader

identity encourages individuals to engage with their leadership role, it indeed is a form of motivation. Thus, we argue that positive reactions to leadership training will strengthen one's leader identity. Identity, in turn, will motivate participants to engage with leadership, which will render them more effective. Indeed, Warhurst (2011) proposed that managerial identity facilitates the transfer of acquired knowledge and skills from formal interventions to workplace performance. In addition, meta-analytical evidence suggests that both affective training reactions (e.g. whether one enjoys the training) and utility reactions (e.g. whether the training is perceived to be useful) positively associate with the reported use of learned skills and behaviors on the job (Blume *et al.*, 2010) and job performance (Alliger *et al.*, 1997). Thus, we propose the following hypothesis:

- H2.* Leader identity mediates the relationship between reactions to leadership training and leader effectiveness.

#### *The moderating role of leadership experience*

So far, we have argued that the relationship between reactions to leadership training and effectiveness is mediated by leader identity. We complicate this model further by arguing that the strength of this indirect effect will depend on leadership experience. We propose that leader identity will only mediate the stated relationship when leaders are less experienced. With more leadership experience, leaders accumulate role specific KSAs (McCall, 2010; McCall, 2004), which allows them to become more effective in their leadership role (e.g. Avery *et al.*, 2003). Similarly, the job performance literature suggests that the gap between typical and maximum individual performance decreases with experience (Sackett *et al.*, 1988). More experienced leaders operate closer to their potential maximum performance levels (i.e. leader effectiveness); this implies that the potential (effectiveness) gains to be reaped from leadership training are much larger for less experienced leaders.

We propose that leader identity partially explains why more experienced leaders have less to gain (in terms of effectiveness) from leadership training. Experienced leaders likely possess a more complex leader identity that encompasses qualitatively different sets of KSAs (Lord and Hall, 2005). For example, Mumford *et al.* (2007) found that leaders possess different and more complex skills at higher organizational levels. Experienced leaders already have a solidified understanding of their leadership role (i.e. strong alignment of the leadership role and leader identity). Thus, while experienced leaders may react positively to training and may be well engaged in training, we expect them to experience less changes in their leader identity than their less experienced counterparts. Furthermore, experienced leaders are experts in leadership (i.e. their leadership KSAs are more complex and developed), thus they are less likely to gain from leadership trainings (see also Hirst *et al.*, 2004). Thus, we propose the following hypothesis:

- H3.* Leadership experience will moderate the strength of the mediated relationship between reactions to leadership training and leader effectiveness via leader identity, such that the mediated relationship will be weaker when leadership experience is high than low.

## **Method**

### *Participants and procedure*

Authors asked five graduate university students to recruit participants for this study. The students approached managers from several German organizations using personal contact or cold-calling letters. Participants were encouraged to invite their network to participate in the survey (snowball sampling). Questionnaires were administered online and

all measures were self-reported. Study scales were translated into German using the collaborative and iterative translation approach (Douglas and Craig, 2007).

We only retained participants who indicated that they had followed a leadership or management training in the previous six months ( $n = 196$ ). Participants reported having spent an average of 54 hours ( $SD = 83$ ) in leadership training in the past half year. The reported types of training were lectures and discussions (56 percent), experiential learning (51 percent), feedback (39 percent), role-playing (37 percent), coaching and mentoring (32 percent), among others. The number of subordinates ranged from 1 to 3,500 ( $M = 90$ ,  $SD = 399$ ); thus, all study participants occupied a formal leadership position in their respective organizations. In total, 17 percent were female and the average age was 46.5 years. Participants worked in a wide range of German industries: electronics (63.8 percent), tourism (6.6 percent), banking and financial services (4.6 percent), consulting (4.1 percent), and other industries (20.9 percent).

### *Measures*

All items in the study were rated on a seven-point scale (e.g. 1 = strongly disagree, 7 = strongly agree), unless indicated otherwise. Reactions to leadership training were measured using an adopted multidimensional measure of trainee reactions (Wexley and Baldwin, 1986), in line with suggestions (Brown, 2005; Morgan and Casper, 2000). The scale consisted of five items, capturing perceived learning (i.e. "I learned a lot"), utility ("I would recommend this program to colleagues"), and intent ("I think I will use the skills I have learned").

Leader identity was measured using four items from the leader self-identity scale (Hiller, 2005). Previous research supports the validity and reliability of this scale (Day and Sin, 2011). Participants rated how descriptive each statement was of them. Sample items are "I am a leader" and "I prefer being seen by others as a leader."

Leader effectiveness was measured using a five-item scale developed by Day and Sin (2011). We modified the items to refer to a broader work setting, as original items referred to team setting. Items reflected leadership behaviors for the successful completion of project (work) goals (e.g. supporting, setting direction, encouraging learning). To reduce potential self-report bias, the referent for the scale was changed so that the respondents were asked how their subordinates would presumably evaluate their leader effectiveness (e.g. Schat and Frone, 2011). Previous research suggests that asking respondents to change their perspective, socially desirable responding tendencies are reduced, yielding more accurate ratings of one's performance (Schoorman and Mayer, 2008). A sample item is "This person helps to set the direction in meeting project goals."

Leadership experience was measured using a one-item scale devised specially for this study. Respondents were asked to indicate how many years they had been in a formal leadership role. We chose to focus on formal leadership positions as an indication of leadership experience because such information is easier to recall for participants. Although leadership experience may be acquired informally, formal workplace experiences are most beneficial for leadership development (McCall, 2010).

Control variables. We controlled for gender, as men and women may differ in their leader self-perception (Day and Sin, 2011). For example, females rated themselves lower on a range of leadership competencies (Mayo *et al.*, 2012). We controlled for the number of subordinates participants had. A larger number of subordinates may increase leader's role complexity (e.g. coordination becomes more difficult), and thus may decrease effectiveness. Finally, we controlled for the number of hours participants reported spending in training because longer interventions may have larger impact on leader identity and effectiveness (Avolio *et al.*, 2009).

We conducted a confirmatory factor analysis using covariance matrix and maximum likelihood estimation to examine the distinctiveness of the study variables. Results of the

proposed three-factor structure (reactions to leadership training, leader identity, and leader effectiveness) demonstrated a reasonable fit with the data:  $\chi^2(74) = 206.23, p < 0.01$ , RMSEA = 0.09, SRMR = 0.07, CFI = 0.91. To test for discriminant validity of study constructs, we compared the three-factor model with a one-factor model and a two-factor model that combined leader effectiveness and leader identity. The three-factor model was superior to alternative models, as both one-factor model ( $\Delta\chi^2(3) = 1,307.45, p < 0.00$ ) and two-factor model ( $\Delta\chi^2(2) = 214.93, p < 0.01$ ) showed a significantly worse fit. All scales demonstrated an acceptable reliability ( $\alpha$ : reactions = 0.92, identity = 0.79, effectiveness = 0.82).

**Results**

Descriptive statistics and intercorrelations, for all study variables are presented in Table I. Hypotheses were tested using hierarchical linear regression (H1) and structural equation modeling (SEM, H2 and H3). SEM provides important advantages over other testing approaches (e.g. OLS regression), as it allows to incorporate measurement error (Sardeshmukh and Vandenberg, 2017). Analyses were performed using SPSS and Mplus (version 7.1; Muthén and Muthén, 1998-2012). Independent, mediation, and moderation variables were centered to reduce the non-essential collinearity between these variables and their product terms (Aiken and West, 1991; Edwards and Lambert, 2007). We obtained standard errors, indirect effects, and 95% confidence intervals using bootstrapping procedures ( $n = 5,000$ ) (Preacher *et al.*, 2007), when testing for mediation and moderation. The use of bootstrapped confidence intervals avoids the power problems of asymmetry and non-normal sampling distributions of an indirect effect (MacKinnon *et al.*, 2004).

H1 proposed that reactions to leadership training would be positively related to leader identity. Indeed, we find this to be the case while controlling for gender, number of subordinates, and number of training hours ( $\beta = 0.186, p < 0.01$ ). H1 is thus supported.

H2 proposed that leader identity mediates the relationship between reactions to leadership training and leader effectiveness. To test the proposed mediation, we used path analytic techniques in order to model several related regression relationships simultaneously (Muthén and Muthén, 1998-2012). Reactions to leadership training were positively related to leader effectiveness ( $\beta = 0.18, p < 0.01$ , see Table II) and leader identity ( $\beta = 0.20, p < 0.01$ ). Leader identity was positively related to leader effectiveness ( $\beta = 0.18, p < 0.01$ ). The proposed indirect effect was also significant ( $\beta = 0.04, SE = 0.02, p < 0.05$ , bootstrapped 95% CI: 0.02, 0.07). H2 is thus supported.

H3 proposed that leadership experience would moderate the indirect effect of leader identity for the reactions to training to leader effectiveness relationship, such that the mediated relationship will be weaker when leadership experience is high. To assess this moderated mediation effect (Preacher *et al.*, 2007), we examined different conditional indirect

Variable	Mean	SD	1	2	3	4	5	6
1. Gender	0.17	0.38						
2. Number of subordinates	90.6	399.3	-0.072					
3. Number of training hours	54.0	83.0	-0.175*	0.170*				
4. Reactions to leadership training	5.28	0.96	0.005	0.045	0.245**			
5. Leader identity	5.26	0.95	-0.019	-0.026	0.095	0.188*		
6. Leadership experience	12.55	9.28	-0.184*	0.084	0.036	-0.077	0.115	
7. Leader effectiveness	5.86	0.53	-0.15	0.118	0.116	0.370***	0.308***	0.166*

**Notes:**  $n$  ranged from 188 to 193. \* $p < 0.05$ ; \*\* $p < 0.01$ ; \*\*\* $p < 0.001$

**Table I.**  
Means, standard  
deviations, and  
correlations of  
study variables

Variable	$\beta$	SE	$t$	$p$	
<i>Dependent variable: leader effectiveness</i>					
Gender	0.048	0.079	0.581	0.561	
Number of subordinates	0.000	0.000	1.294	0.196	
Number of training hours	0.000	0.001	0.123	0.902	
Reactions to leadership training	0.178	0.038	4.703	0.000	
Leader identity	0.177	0.042	4.262	0.000	
<i>Dependent variable: leader identity</i>					
Reactions to leadership training	0.202	0.074	2.727	0.006	
	$\beta$	SE	LL 95% CI	UL 95% CI	$p$
Bootstrap results for indirect effect	0.036	0.016	0.015	0.068	0.023

**Notes:** LL, lower limit; CI, confidence interval; UP, upper limit. Bootstrap sample size = 5,000. All predictor variables were mean-centered

**Table II.**  
Path analysis results for testing mediation in *H2*

effects of reactions to leadership training on leader effectiveness, via leader identity, across low and high levels of the leadership experience. Moderated mediation is demonstrated when this conditional indirect effect differs in strength across low and high levels of the moderator (Preacher *et al.*, 2007). We operationalized high and low levels of leadership experience as 1 standard deviation above and below the mean.

We find an overall significant positive interaction effect of the reactions to leadership training and leadership experience on leader identity (mean  $\beta = 0.04$ ,  $p < 0.05$ , see Table III). Further, results show that the conditional indirect effects of reactions to leadership training were positive and significant in the low leadership experience condition ( $\beta = 0.06$ , SE = 0.02,  $p < 0.05$ , bootstrapped 95% CI: 0.02, 0.10), but not in the high leadership experience condition ( $\beta = 0.02$ , SE = 0.02, ns, bootstrapped 95% CI: 0.02, 0.06). Thus, *H3* is supported.

### Discussion

The present study adds to the existing leadership development literature by examining when and why reactions to leadership training manifest in greater leader effectiveness. Although these relationships have been established in the literature (Waldman *et al.*, 2013; Miscenko *et al.*, 2017), prior research has rarely addressed the mechanisms and boundary conditions. We adopt a between-person approach and find that leader identity mediates the relationship between affective and attitudinal reactions to leadership training and effectiveness. Furthermore, we find that leadership experience moderates these relationships, such that the mediating effect of leader identity only holds for less experienced leaders. Although the cross-sectional nature of our data prevents us from drawing strong causal inferences, we find that data are consistent with our theoretical model.

**Table III.**  
Moderated mediation results for leader identity across levels of leadership experience (*H3*)

Level of the moderator	Conditional indirect effects	SE	$t$	$p$	LL 95% CI	UL 95% CI
Low	0.055	0.023	2.407	0.016	0.023	0.100
Mean	0.035	0.016	2.202	0.028	0.014	0.068
High	0.019	0.023	0.835	0.404	-0.019	0.056

**Notes:** LL, lower limit; CI, confidence interval; UP, upper limit. Low and high level of the moderator estimated at  $\pm 1$  SD (9.276). Bootstrap sample size = 5,000. All predictor variables were mean-centered. Control variables gender and number of subordinates are included



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### *Theoretical implications*

The present study adds to a growing body of leadership studies focused on leader identity, which suggest that leader identity plays an integral role in facilitating the effective development of leadership skills and cognitions (Day *et al.*, 2009; Lord and Hall, 2005). While limited, research suggests that leader identity is malleable and changes during training interventions (Miscenko *et al.*, 2017). Leader identity has been shown to positively relate to leader effectiveness (Day and Sin, 2011). Our study advances this research by developing and testing an integrative model of reactions to leadership training, leader identity, and leader effectiveness. Leadership training provides leaders with an opportunity to align their leadership role and identity by clarifying and reflecting upon role expectations. Consistent with our model, we find that leader identity serves as a motivational mechanism that carries forward the effect from reactions to training to leader effectiveness. This is in line with affect research which links positive affect and motivation (Brown, 2005).

Whereas several recent studies investigated leader identity among students not yet occupying a formal leadership role (Day and Sin, 2011; Waldman *et al.*, 2013), our study supports the importance of studying leader identity among formal leaders. Our findings suggest that leader identity is influenced by training and it predicts leader effectiveness among formal leaders. Although much leadership research has focused on formally appointed leaders (DeRue, 2011), leadership development research has often relied on student samples. We address this imbalance in the literature by focusing on formal leaders.

More generally, our study has implications for the broader literature on work identity – with leader identity being one type of work identity. First, our findings suggest that workplace training can have profound effects on employees' work identity and subsequent role performance. The changes in work identity have been extensively studied (Miscenko and Day, 2016); however, only a handful of studies investigated the effects of training on identity. We show that training can affect not only knowledge and skills, but also work identity. Future research should constructively replicate our findings for other work identities (e.g. professional identity, creative identity). Second, a recent review of the individual work identity literature indicates that the number of qualitative studies in the field clearly outnumbers its quantitative counterparts (Miscenko and Day, 2016). Our study aimed to quantify the effects of leader identity in the context of leader development and training (e.g. Andersson, 2012). Our findings may encourage others to use quantitative means to study work identities.

Leadership experience has been extensively investigated as a predictor of leader effectiveness (e.g. Atwater *et al.*, 1999; Avery *et al.*, 2003). However, our study is the first to empirically test the extent to which leadership experience moderates the relationship between leadership training and effectiveness. We find that the mediating effect of leader identity from reactions to leadership training to leader effectiveness holds only for less experienced leaders.

Finally, our study contributes to the literature on trainee reactions. In the meta-analysis of antecedents and outcomes of trainee reactions, only a few studies were related to leadership or managerial training (Sitzmann *et al.*, 2008). However, as our findings suggest, reactions to training can have profound cognitive and performance implications for leadership. By capturing trainees' affective and attitudinal reactions, research could potentially explain some of the variance in outcomes of leadership interventions. Put differently, the way that participants feel about the training will determine how much they learn about leadership and to what extent they use new skills and behaviors in the workplace.

### *Limitations and future research*

The study has several limitations. First, we employed a cross-sectional design to collect data, which prevents us from drawing any causal inferences and does not allow ruling out

reverse causality issues completely. For example, it is also conceivable that leader effectiveness strengthens leader identity, different from what we hypothesized. Although theoretical considerations speak to direction of influence assumed in our model, we call for cross-lagged analyses to rule out alternative models and increase confidence in the direction of influence.

Second, we exclusively relied on self-reports of employees which raise common-method concerns (Podsakoff *et al.*, 2003). Still, we believe that these concerns are somewhat lessened for various reasons. One is that previous research suggests that the potential for common source bias is minimized when the effectiveness measure is tightly focused on a specific indicator of effectiveness (Meier and O'Toole, 2012). In the present study, we used a leader effectiveness measure that focused on specific aspect of leadership performance, that is, leadership behaviors for the successful completion of project (work) goals. Another reason is that we modified the referent for the leader effectiveness scale in order to reduce potential self-report biases (e.g. Schat and Frone, 2011), as discussed in the methods section. Lastly, it is known that moderation effects are rather unlikely to be influenced by common-method bias (Evans, 1985). Nevertheless, we encourage scholars to investigate the effect of leader identity on more objective ratings of leader effectiveness and to use multi-source data to substantiate our findings.

Third, we did not assess the rationale for why individuals took part in the leadership trainings. This, however, would be important to rule out alternative explanations for our findings. Consider, for example, the possibility that an employee is encouraged by a senior executive to take a leadership training, given his or her "great leadership potential." Such praise from seniors may be enough to inflate the person's leader identity and may do so in ways largely independent of the training. Although we do not have any strong reason to believe that such unmeasured factors might have colored our findings, it still seems imperative for future research to control for the reasons why participants took the training.

Finally, we note the small size of the effects, especially the indirect effects, obtained in our analyses. Following recommendations from the literature, we included bootstrapped confidence interval estimates in the reporting of our results (Shrout and Bolger, 2002). Even though the indirect effect on leadership effectiveness was small, it was consistent with the theoretical propositions, and we hope this will stimulate future research into this issue.

#### *Practical implications*

Our results suggest that experienced and inexperienced leaders may have different training needs (Day *et al.*, 2009). As experienced leaders operate close to their maximum performance levels, as compared to their less experienced colleagues, they may be better served with challenging, long-term training interventions covering more complex knowledge domains (Hirst *et al.*, 2004; Sackett *et al.*, 1988). In other words, senior leaders may benefit more from leadership development rather than leadership training (Day, 2012). Leadership development is more long term and focuses on enhancing an individual's capacity to deal with unknown issues (Day and Harrison, 2007; Fitzgerald, 1992). Leadership training, in contrast, focuses on providing solutions to relatively known day-to-day business problems and thus caters more to the needs of novice leaders.

Similarly, leader development offered to experienced leaders should last considerably longer than training offered to novice leaders. However, this is typically not the case. Our data suggest that leadership experience was not associated with more training hours (i.e. non-significant correlation). A meta-analysis of leadership interventions research reports a median intervention length of just three to six hours (Avolio *et al.*, 2009). Such short training is not likely to induce any changes in skills, behaviors, or effectiveness in more experienced leaders, as they already possess the "easy-to-learn" skills (Lord and Hall, 2005). This proposition is supported by the present study, as our results show that shorter leadership training did not affect leader effectiveness (via leader identity) in more experienced leaders.

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**Note**

1. A related possibility is that stronger leader identity leads to more positive reactions to leadership training because individuals with stronger leader identity are motivated to seek leadership opportunities and would potentially view those more favorably. However, in the present study, we investigated how past reactions to leadership training (i.e. training undergone in the previous six months) are related to leader identity.

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