

NATURE-BASED TRAINING PROGRAM FOSTERS AUTHENTIC LEADERSHIP

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Authentic leadership is frequently promoted as a leadership style that responds to the contemporary challenges that leaders face. The current experimental study ($n=66$) tested intrapersonal change toward authentic leadership after participation in a nature-based training program that included a stay in remote wilderness without any facilities. Authentic leadership was measured before, immediately after, and 1 year after the training program. All components of authentic leadership increased, namely self-awareness, internalized moral behavior, balanced processing, and relational transparency, with medium to large effect sizes ($d \approx .7$). Changes in general personality traits were of a lower magnitude, suggesting that change was specific to authentic leadership, rather than extending into general psychological characteristics. The findings demonstrate that a nature-based training program can increase authentic leadership. Immersion in wilderness is possibly conducive to change in leadership style, and could be considered as a strategy for fostering leadership change.

Introduction

Over the last three decades, the role of contemporary leaders has expanded from one that focuses on traditional organizational values (e.g., product and service quality, financial performance) to one with a broader orientation that includes social responsibility and environmental stewardship (Crooke, Csikszentmihalyi, & Bikel, 2015). In addition, leaders in Western societies have been confronted with public distrust (Burke, 2006; Williams, Campbell, McCartney, & Gooding, 2013). In response to the challenges of increasing complexity and decreasing trust, scholars and organizations have started to reflect on leadership styles and characteristics (Avolio & Gardner, 2005), to promote “posttraditional” forms of

leadership (Avolio & Luthans, 2006; Cooper, Scandura, & Schriesheim, 2005). Various concepts reflect post-traditional leadership styles, such as transformational (Bass & Bass, 2008; Bass & Steidlmeier, 1999), charismatic (Conger & Kanungo, 1998), servant (Greenleaf & Spears, 1998; Van Dierendonck, 2010), ethical (Brown, Treviño, & Harrison, 2005), spiritual (Crossman, 2011; Fry, 2003), and authentic leadership (Avolio, Gardner, Walumbwa, Luthans, & May, 2004; Avolio & Luthans, 2006; George & Sims, 2007; Hofman, 2005; Lorenzi, 2004). Authentic leadership is the most comprehensive leadership style concept, as it includes leadership attributes articulated in the other concepts (Avolio & Gardner, 2005; Gardner, Avolio, Luthans, May, & Walumbwa,

2005; George & Sims, 2007; Luthans & Avolio, 2003; Walumbwa, Avolio, Gardner, Wernsing, & Peterson, 2007). Authentic leadership is defined as “[a] pattern of leader behavior that draws upon and promotes both positive psychological capacities and a positive ethical climate, to foster greater self-awareness, an internalized moral perspective, balanced processing of information, and relational transparency on the part of leaders working with followers, fostering positive self-development” (Walumbwa et al., 2007, p. 94). As such, commitment to authentic leadership would increase the capacity of leaders to respond to current challenges (Hannah, Avolio, & Walumbwa, 2014; May, Chan, Hodges, & Avolio, 2003). Greater ethical responsibility and transparency from the leaders could foster increased social responsibility and environmental stewardship, as well as contribute to building public trust.

Change toward authentic leadership may occur intergenerationally. For instance younger leaders, as a result of changes in curricula over the years, might already have more authentic leadership attributes than leaders from previous generations. If younger leaders then succeed older leaders when they retire, an aggregate level shift in leadership style might occur. However, such hypothetical intergenerational change is likely to be slow. Intrapersonal change toward authentic leadership would be faster and hence more effective when it comes to addressing contemporary leadership challenges. The present paper describes a study examining the effect of a nature-based training program on intrapersonal change toward authentic leadership. A positive effect could provide managers with an additional tool for leadership development, and influence the change toward authentic leadership.

Literature Review

AUTHENTIC LEADERSHIP: CHARACTERIZATION, CRITICISM, AND COMPONENTS

Authentic leaders gain credibility and the trust of their followers through behavior that is in accordance with their values (Avolio et al., 2004), and genuinely desire to serve others through their leadership (George, 2003). Authentic leaders are characterized as leaders who are deeply aware of their values and beliefs, are self-confident, genuine, reliable, and trustworthy, take care of the

development of their followers, enlarge their scope of interest, and establish an engaging, positive organizational climate (Avolio & Gardner, 2005; Gardner et al., 2005). In the leadership literature, authentic leadership is considered to be a “root concept” that underlies all forms of positive leadership and its development (Ilies, Morgeson, & Nahrgang, 2005). For instance, Luthans and Avolio (2003) contended that authentic leaders have positive psychological capabilities (confidence, hope, optimism, resilience), are morally grounded, future-oriented, and focus on developing other leaders. Authentic leaders stay close to themselves. Kernis (2003) argued that authenticity entails the unimpeded operation of one’s true self in everyday life. Shamir and Eilam (2005) described authentic leaders as people whose role is a central component of their self-concept, who have a clear concept of self, and subsequently have self-concordant goals and show self-expressive behavior.

Leadership scholars have criticized the literature on authentic leadership, questioning whether a “true self” or “authentic self” exists, and whether acting according to one’s true self would lead to morally good behavior (Collinson, 2011; Spoelstra, Butler, & Delaney, 2016). Whether the criticism is justified or not, an appraisal of relevant criticism is important to avoid blind adoption of the authentic leadership concept.

The question of whether a true self exists has a long-standing history in philosophy.

For example, Aristotle’s notion of “*eudaimonia*” refers to a life that is lived in truth with one’s true being (Pojman, 2006). Others have argued that being authentic is not possible, because an individual has no fixed inner essence to be “true” to (Golomb, 1995). Existential philosophers, such as Sartre, Kierkegaard, Heidegger, and Buber, addressed the importance of the true self when individuals try to give meaning to their lives and live authentically (Macquarrie, 1972). The existential philosophers did not claim a fixed true self, but rather stressed that individuals are always situated in historical and social contexts (Gardiner, 2015). Seeking authenticity is a process in which the self continuously transforms through compromises regarding social norms and standards (Heidegger, 1962; Sartre, 1996). In concordance, the transformation processes of true selves in relation to their social contexts are important perspectives that are represented in the leadership literature

as well (Ford & Harding, 2011; Shaw, 2010). Some literature on authentic leadership suggests people do have a fixed authentic self that needs to be found and emphasized in one's leadership orientation (Avolio & Gardner, 2005; Bass & Steidlmeier, 1999). Yet, others have conceptualized authenticity as an ongoing process that requires a connection with the organizational collective, conjointly enhancing meaningful work and ethical behavior (Algera & Lips-Wiersma, 2012; Nyberg & Sveningsson, 2014).

Similarly, literature on authentic leadership suggests that the concept builds on the implicit premise that acting in accordance with an essential true self is morally good (Avolio et al., 2004; Ilies et al., 2005; Ladkin & Taylor, 2010; Luthans & Avolio, 2003; Walumbwa et al., 2007, 2010). Yet, an implicit suggestion does not imply that the same authors believe the premise is true. There is no a priori reason to assume that emphasizing one's authenticity (whether fixed or perpetually constructed) leads to good behavior (Algera & Lips-Wiersma, 2012; Ford & Harding, 2011; Nyberg & Sveningsson, 2014). In addition, the notion of good behavior is in itself problematic, as behavior in complex settings is rarely purely right or wrong (Lawler & Ashman, 2012) and what is right or wrong depends on the observer's perspective.

In short, the existence of a fixed authentic self and the idea of good moral behavior as an automatic outcome of being authentic cannot be assumed. In the present study, both assumptions are not necessary, because the measures reflect the four core components of authentic leadership (Avolio, Griffith, Wernsing, & Walumbwa, 2013; Avolio, Walumbwa, & Weber, 2009). These four components are: (a) self-awareness, which refers to understanding one's strengths and weaknesses; (b) internalized moral perspective, which is a self-regularity process guided by moral standards and values; (c) balanced processing, which implies objectively analyzing all relevant information before making a decision; and (d) relational transparency, which denotes openness and honesty in presenting oneself to others. The four-component model was operationalized as a survey instrument and successfully employed and validated in a variety of studies (e.g., Gardner, Coglisier, Davis, & Dickens, 2011; Neider & Schriesheim, 2011; Walumbwa et al., 2007). It is probable that

people have, for instance, strengths and weaknesses, internal moral standards, and core beliefs, regardless of the question of whether a pre-existing authentic self exists. In the present study, the instrument was applied longitudinally within an experimental design to assess authentic leadership development. It is likely that increased internalized moral perspective and relational transparency are conducive to meet the challenge of public distrust in leaders, and that self-awareness and balanced processing help address the challenge of increased complexity.

INVESTIGATING LEADERSHIP CHANGE

Leadership scholars have contended that intrapersonal leadership development practices are a loose collection of assumption-driven actions, rather than evidence-based programs (Day, 2000; Day & Halpin, 2012; Luthans & Avolio, 2003). Nevertheless, reviews suggest that leadership interventions can have the intended positive effects (Avolio, Reichard, Hannah, Walumbwa, & Chan, 2009; Collins & Holton, 2004; Day, Fleenor, Atwater, Sturm, & McKee, 2014). The most comprehensive review, a systematic meta-analysis of 200 empirical studies, suggested a 66% probability of achieving a positive outcome after leadership interventions (Avolio, Reichard, et al., 2009). On average, the effects sizes were moderate, yet the effectiveness largely varied across studies.

Experimental studies have investigated specific outcomes of training or other interventions, such as task performance, job satisfaction, or persuasiveness (for specific examples, see Avolio, Reichard, et al., 2009, table 2). Experimental studies have not yet addressed the effect of interventions on general authentic leadership style, rather than specific behaviors or mental dispositions. Thus, the present study makes an original contribution to the literature by investigating general authentic leadership change.

Only a few studies on leadership intervention effects included a thorough evaluation and measurement of leadership development outcomes (Gurjian, Halbeisen, & Lane, 2014; Kaiser & Curphy, 2013). Studies with longitudinal measurements, which allow systematic comparison of leadership attributes before and after intervention, are relatively rare (Day et al., 2014). A qualitative study by Baron and Parent (2015) suggested

that participants in a training program introspectively noticed development in three dimensions of authentic leadership (self-awareness, relational transparency, and balanced treatment of information). Another study used classroom trigger events and an exercise, and concluded that these interventions stimulated a learning orientation toward authentic leadership based on a content analysis of students' narratives (Roche, 2010). While these findings suggest that authentic leadership development is achievable, there is still a need for quantitative research, which allows statistical testing (Cooper et al., 2005; Day et al., 2014; Luthans & Avolio, 2003; Roche, 2010). The present study applied an experimental design with quantitative measures to investigate change toward authentic leadership.

Most of the studies on leadership interventions are laboratory studies or focus on leadership development programs that use traditional settings such as conference venues (Day, 2011). However, other spatial contexts might be conducive to leadership development as well. "Critical life events", that is, trigger events that shape people's lives, are an important antecedent of authentic leadership (Cooper et al., 2005; Gardner et al., 2005; Lord & Hall, 2005; Luthans & Avolio, 2003; Lynn, 1992). Especially spending time in nature could act as a trigger event that could foster authentic leadership (Shamir & Eilam, 2005; Sparrowe, 2005). Evidence from environmental psychological research indeed confirmed that being in nature has various psychological effects, some of which resonate closely with the components of authentic leadership. These effects include stress reduction (Bratman, Hamilton, & Daily, 2012; Kaplan, 1995; Ulrich et al., 1991); attention restoration (Berman, Jonides, & Kaplan, 2008; Cole & Hall, 2010); emotional well-being (Hinds, 2011; Hinds & Sparks, 2008; Zelenski & Nisbet, 2012); personal development and increased self-awareness (D'Amato & Krasny, 2011; Friese, Pittman, & Hendee, 1995; Heintzman, 2009; Talbot & Kaplan, 1986); an increase in creativity, inspiration and spirituality, greater authenticity, and connectedness (Frederickson & Anderson, 1999; Howell, Dopko, Passmore, & Buro, 2011; Kaye, 2006); and potential for contributing to sustainability (Koskela & Goldman Schuyler, 2016). Thus, immersion in wilderness could induce high-impact experiences, which might act as trigger events fostering

intrapersonal change (Boniface, 2000; Maslow, 1964; McDonald, Wearing, & Ponting, 2009). The present study makes a novel contribution to the literature by investigating the effect of participation in a 14-week nature-based leadership training program on intrapersonal change toward authentic leadership. The core of the program consists of immersion in remote wilderness for 4–6 days, preceded by introductory and preparation meetings, and followed by reinforcement and evaluation meetings. While the literature assumes authentic leadership development to be a lifelong learning process (Day & Halpin, 2012; Lord & Hall, 2005), long-term change is by necessity implemented through a series of short-term changes. Also, the trigger event effect of immersion in wilderness could catalyze change. Therefore, the following hypothesis was tested: Participation in a nature-based training leadership transformation program increases authentic leadership.

To investigate whether the effects of the program are specific to authentic leadership, or whether these effects extend beyond the domain of leadership, the study examined personality traits as well. Personality traits are the most basic psychological characteristics of individuals (Goldberg, 1992). It is likely that a leadership training program has a larger effect on leadership attributes than on personality traits. Including personality traits in the measurement generates insight into the specificity of the training program and therefore increases the understanding of potential effects. Hence, the following hypothesis was tested: Changes in personality traits as a result of the program are of a lesser magnitude than changes in authentic leadership.

Methods

DESIGN

The present study adopted a natural experimental design, which is typically useful for studying relationships between phenomena that cannot be studied in laboratory settings (Bakker & Jacobs, 2016). The study applied a within-participants design and used longitudinal measures (i.e., the same survey to assess authentic leadership components before and after the intervention). The control condition was the level of authentic leadership before the training program, and the experimental condition was the equivalent level after

the program, and hence, the effect was the within-participants change in authentic leadership. Assuming that other factors do not systematically covary between the conditions, cause–effect relationships can be inferred. Lack of control of potential covariates can be a possible weakness of natural experiments and can affect internal validity. On the other hand, external validity is a strength of natural experiments, as the problem of whether laboratory findings can extend to the complex real world does not exist.

CONTEXT

Data were collected during 2015 among participants of the Wilderness Leadership Transformation Program of the Foundation for Natural Leadership (FNL), based in the Netherlands. The program consisted of a 4–6-day wilderness trail with a group of five to seven participants, accompanied by one or two local guides and a certified FNL facilitator. The training program aimed to develop participants’ “natural leadership” behavior and their regard for it, whereby the FNL description of “natural leadership” mirrors the construct of authentic leadership. The design of the trail provided the necessary conditions for full immersion in nature. Participants hiked in remote natural places without human-made facilities, carrying only backpacks with a sleeping bag and food. Trails were organized in remote wilderness areas in Europe (Switzerland, Spain, and Ireland) and Africa (South Africa and Botswana). Participants camped, walked in silence, experienced periods of solitude, and slept in the open air. In addition, the program facilitated self-reflection, the sharing of life stories and experiences, and one-to-one conversations. After the trail experience, each participant and the facilitator evaluated the event, and the commitments and intentions that had emerged. Finally, after 2 months, trail participants met to share how those commitments and intentions were put into practice.

SAMPLING PROCEDURE AND SAMPLE

In 2015, the FNL organized 17 trail programs. All 107 participants in these programs, including leaders working in business, banking, and institutional and governmental settings, were approached to participate in the study. A researcher visited the training program introduction meetings to explain the data collection procedure to the participants and to guarantee anonymous and

confidential treatment of their data. Two weeks before the wilderness experience, participants received an invitation by email to complete the web-based pre-event survey. Ten weeks after the wilderness experience and at the end of the entire training program, participants received a similar invitation to complete the postevent survey. One year later, participants were asked to fill out a delayed postevent survey. As short-term effects might fade away over time (Jacobs & Harms, 2014), the delayed survey was needed to examine persistence of effects. Participants received two email reminders for the pre-event survey, and three reminders for the postevent survey and the delayed postevent survey. Of the training program participants, 89 (83%) completed the pre-event survey and 66 (62%) completed the pre- and both postevent surveys. Of the participants included in the analyses, 33% were female, and the mean age was 45 ($SD=6.38$).

VARIABLES

All three surveys contained the same scales. The 16-item Authentic Leadership Inventory (Walumbwa et al., 2007) was used to measure participants’ leadership orientation. Specific formulations were converted to self-assessment items (e.g., “My leader is clearly aware of the impact he/she has on others” was transformed into “I, as a leader, am clearly aware of the impact I have on others”) (see Table 1 for all items). Prior research demonstrated adequate reliability of the authentic leadership measures in the 16-item inventory (Neider & Schriesheim, 2011). Personality traits were measured with the 50-item International Personality Item Pool Big-Five Factor Markers (Goldberg, 1992). The measures in the personality inventory assess the so-called “Big Five” personality traits of emotional stability, extraversion, openness to experience, agreeableness, and conscientiousness. The scales are validated and frequently used (Costa & McCrae, 1992; Judge & Bono, 2000). All variables were coded on 5-point response scales, ranging from 1 (*strongly disagree*) to 5 (*strongly agree*) with a neutral point. Additionally, both surveys included information on gender, age, trail destination, and date.

ANALYSES

Reliability analyses were used on the converted self-assessment scales to verify whether the associated items intended to measure one construct indeed

Table 1. Reliability Analyses of Authentic Leadership Components

| Authentic leadership component Item | Corrected item- total correlation | Alpha if item deleted | Cronbach's alpha |
|--|--|----------------------------------|-------------------------|
| <i>Self-awareness</i> | | | .59 |
| I, as a leader, solicit feedback for improving my dealings with others. | .31 | .57 | |
| I, as a leader, describe accurately the way that others view my abilities. | .44 | .47 | |
| I, as a leader, show that I understand my strengths and weaknesses. | .38 | .52 | |
| I, as a leader, am clearly aware of the impact have on others. | .37 | .53 | |
| <i>Internalized moral behavior</i> | | | .68 |
| I, as a leader, show consistency between my beliefs and actions. | .55 | .55 | |
| I, as a leader, use my core beliefs to make decisions. | .56 | .57 | |
| I, as a leader, resist pressures to do things contrary to my beliefs. | .39 | .68 | |
| I, as a leader, guide my actions by internal moral standards. | .40 | .65 | |
| <i>Balanced processing</i> | | | .59 |
| I, as a leader, ask for ideas that challenge my core beliefs. | .41 | .49 | |
| I, as a leader, carefully listen to alternative perspectives before reaching a conclusion. | .41 | .49 | |
| I, as a leader, objectively analyze relevant data before making a decision. | .27 | .61 | |
| I, as a leader, encourage others to voice opposing points of view. | .42 | .49 | |
| <i>Relational transparency</i> | | | .67 |
| I, as a leader, clearly state what I mean. | .63 | .46 | |
| I, as a leader, admit mistakes when they occur. | .35 | .67 | |
| I, as a leader, openly share information with others. | .31 | .69 | |
| I, as a leader, express my ideas and thoughts clearly to others. | .56 | .53 | |

had acceptable internal consistency, so that the items could be combined into composite variables representing the latent constructs. Paired sample *t* tests were used to estimate differences in authentic leadership and personality traits within participants before and after the training program, and after 1 year. To address the increased chance of a Type I error due to simultaneous testing, the Bonferroni correction (i.e., dividing the .05 alpha level by the number of simultaneous tests) was applied (Cabin & Mitchell, 2000). Cohen's *d* was used as the associated effect size statistic.

Results

RELIABILITY ANALYSES

The internal consistencies of the self-assessment scales of internalized moral behavior (.68) and relational

transparency (.67) were adequate (Table 1), based on the habitually accepted cut-off point of .65. The reliabilities of self-awareness (.59) and balanced processing (.59) were somewhat low. However, as Cronbach's alpha increases with the number of items, a value of .60 is considered acceptable for scales with only a few (e.g., four) items (Loewenthal, 2002; Schmitt, 1996). Deleting items would not substantially increase the value of alpha for any of the constructs (as indicated under the column "Alpha if item deleted" in Table 1). Therefore, composite indices were computed for each of the authentic leadership components as the means of the associated items. The composite indices were used for further analyses.

The internal consistencies for the personality traits were .85 for emotional stability, .79 for extraversion, .74 for openness to experience, .79 for agreeableness,

and .72 for conscientiousness. Composite indices were computed for each of the personality traits and used for further analyses.

CHANGES IN AUTHENTIC LEADERSHIP

The results of the pre-event survey show that, before the training program, participants were already oriented toward authentic leadership (Table 2). Still, all authentic leadership components increased after the training program. The effect sizes of all increases in authentic leadership components were in the range of .61 to .75, which can be qualified as effect sizes between medium and large (Cohen, 1988). These figures confirm the first hypothesis that participation in the program increases authentic leadership. Increases in authentic leadership persisted after the training program. Balanced processing increased during the year after with 0.31 ($t=4.51, p<.001$); all other authentic leadership components were statistically equal for the post and 1 year after measurements.

The increases in authentic leadership were not statistically different between sexes and between locations

of the training program as estimated by independent sample t tests.

CHANGES IN PERSONALITY TRAITS

The change in four of the five personality traits was statistically significant (Table 3). The effect sizes of changes in personality traits changes were considerably lower than the effect sizes of changes in authentic leadership. These findings suggest that changes in personality traits were of a lower magnitude than changes in authentic leadership style, in line with the second hypothesis.

DISCUSSION AND CONCLUSION

The study's natural experiment offered evidence that all components of authentic leadership can increase within participants, following a nature-based training program. Moreover, the change did not fade away over time, as suggested by the delayed (1 year) measurement. Changes in psychological dispositions were predominantly specific to authentic leadership. In contrast, changes in personality traits were of a considerably

Table 2. Differences in Authentic Leadership Components Before and After Training Program

| Authentic leadership component | Mean (SD)—Pretraining | Mean (SD)—Posttraining | Mean (SD) 1 year after training | Difference Pre – Post | t value | p value | Cohen's d |
|--------------------------------|-----------------------|------------------------|---------------------------------|-----------------------|-----------|-----------|-------------|
| Self-awareness | 3.84 (0.56) | 4.21 (0.48) | 4.25 (0.56) | 0.37 | 5.23 | <.001* | 0.71 |
| Internalized moral behavior | 4.26 (0.58) | 4.63 (0.39) | 4.58 (0.43) | 0.37 | 4.83 | <.001* | 0.75 |
| Balanced processing | 3.92 (0.58) | 4.27 (0.52) | 4.58 (0.43) | 0.35 | 5.81 | <.001* | 0.64 |
| Relational transparency | 4.25 (0.52) | 4.56 (0.50) | 4.56 (0.39) | 0.31 | 4.67 | <.001* | 0.61 |

*Significant at the Bonferroni corrected alpha level of .05/4=.0125.

Table 3. Differences in Personality Traits Before and After Training Program

| Personality traits | Mean (SD)—Pretraining | Mean (SD)—Posttraining | Mean difference | t value | p value | Cohen's d |
|------------------------|-----------------------|------------------------|-----------------|-----------|-----------|-------------|
| Extroversion | 3.56 (.58) | 3.53 (.58) | -0.03 | 1.23 | .225 | 0.05 |
| Agreeableness | 4.20 (.53) | 4.35 (.49) | 0.15 | 3.35 | .001* | 0.29 |
| Conscientiousness | 3.48 (.57) | 3.66 (.51) | 0.18 | 3.36 | .001* | 0.33 |
| Emotional stability | 3.78 (.68) | 4.05 (.67) | 0.27 | 4.00 | <.001* | 0.40 |
| Openness to experience | 3.96 (.43) | 4.11 (.45) | 0.15 | 3.43 | .001* | 0.34 |

*Significant at the Bonferroni corrected alpha level of .05/5=.01.

lesser magnitude. Previous qualitative studies suggested that appropriate training programs could foster authentic leadership (Baron & Parent, 2015; Evans, Hess, Abdelhamid, & Stepleman, 2016; Roche, 2010). Importantly, the present study provided more robust evidence based on longitudinal measures, as recommended for testing the effectiveness of leadership interventions (Day, 2011).

The present study did not focus on whether the measured increases lead to better behavior. Yet, it is likely that leaders with an enhanced authentic leadership style will tend to behave in ways that respond to current leadership challenges, and in that sense could be called morally better leaders. However, the issue was not empirically addressed in the present study and thus requires further research.

The study extended current insights into leadership development. Previous research predominantly addressed specific outcomes of interventions, such as task performance, job satisfaction, or persuasiveness (see Avolio, Reichard, et al., 2009, table 2). In contrast, the present study makes a new contribution to the literature by demonstrating change in general authentic leadership style. Change in authentic leadership is much broader than change in specific outcomes, as it reflects leaders' overall orientation. The effect sizes for the changes in authentic leadership components were between .61 and .75. Remarkably, these effect sizes are similar to the average effect sizes reported in a meta-analytic study (.67 after removing outliers and correcting for sampling bias and measurement error) that analyzed experiments targeting specific outcomes (Avolio, Reichard, et al., 2009). Generally, specific behaviors or dispositions are easier to change than more general ones, as the latter are more central to one's belief system or identity (Ajzen, 2005). The findings of the present study raise the question as to what aspects of the training program fostered the increase in authentic leadership. Answering the question is important because it can provide clues about how to improve training interventions (Avolio, Reichard, et al., 2009).

It is likely that the training program's participants' immersion in the wilderness influenced the change in leadership style. A lengthy stay in remote natural areas is a distinctive feature of the examined training program relative to other training programs that were

investigated by other researchers. The interpretation of the present study's findings parallels those in the existing literature, demonstrating that nature experiences can have positive effects on a variety of specific mental dispositions of individuals, such as stress-reduction, self-awareness, and connectedness (Frederickson & Anderson, 1999; Heintzman, 2009; Kaplan & Kaplan, 1989).

Additionally, the duration of the training program may partially explain the considerable increase in general authentic leadership orientation. A meta-analysis concluded that only 9% of the assessed studies exceeded 7 days in duration (Avolio, Reichard, et al., 2009). The median intervention length was 3–6 hours, while the modal intervention length was under 1 hour. The present study examined a training program of 4–6 days, with additional preparatory and evaluation meetings within a time frame of approximately 14 weeks. The majority of participants continued meeting each other once or twice a year afterward.

Furthermore, the program facilitated peer-to-peer interactions. Prior studies have demonstrated that peer learning is an effective form of learning (Clark & Dumas, 2015). Life story telling, which is a part of the investigated training program, is a technique that fosters peer learning (Shamir & Eilam, 2005; Sparrowe, 2005). Telling life stories enables leaders to reflect on their values and emotions, and provides anchor points from which leadership approaches and identities develop and grow (Turner & Mavin, 2008). As the present research context did not allow us to vary these features (i.e., immersion in nature, duration, peer-to-peer interactions) of the training program, future studies are needed to examine the merits of these explanations of the findings.

Self-report measurements have limitations that merit consideration when evaluating the findings. The information processing that was required to fill out the questionnaires might make the participants' responses susceptible to bias (Diddams & Chang, 2012; Messick & Bazerman, 2004; Tice & Wallace, 2003), such as bias pertaining to inaccurate self-assessment or social desirability. As an example of a potential source of inaccuracy, participants may find it difficult to assess the impact they have on others, or to estimate how clearly they express their ideas and thoughts to others.

Yet, findings are based on composite indices with adequate reliability and therefore less susceptible to bias in single items. Also, it is important to realize that the present study's results were based on comparing, within individuals, self-reports at three different points in time. If biases influenced the responses, it is likely that they influenced the responses similarly for all three questionnaires, and hence, the measured differences are likely to signify actual differences. Still, a potential form of social desirability bias might exist, as participants have invested in the training and might therefore be willing to present themselves as having changed. A follow-up study among employees of the participating leaders is currently being conducted in order to increase insight in bias due to investment.

The experimental design was applied to a complex, real-world situation. In addition, the sample consisted of 66 seasoned leaders working in business, banking, and institutional and governmental organizations. As the findings reflect the actual change in actual leaders after an actual training program, the present study provided evidence that a nature-based training program could foster change toward authentic leadership. As such, it could inform managers' choices of leadership development options for themselves and their followers.

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