Episodic memories of wilderness experiences foster sustainable leadership style transformation

Boy van Droffelaar
Wageningen University and Research, Wageningen, The Netherlands

Abstract

Purpose – This research evaluates (1) work situations prompting participants to recall memories of a wilderness-based leadership training program, (2) the content of such memories, and (3) the leadership attitudes and behaviors inspired by those memories.

Design/methodology/approach – A qualitative content analysis of semi-structured interviews was performed with 36 leaders who had participated in a wilderness leadership transformation program in the past (on average six years before).

Findings – The findings suggest that, at moments with emotional pressure and psychological stress, episodic memories of wilderness experiences have a positive influence on actual leadership style. Memories involved moments of solitude, a deep connection with nature, and peer-to-peer counseling. The interviewees regularly relived their emotion-laden wilderness experiences, acquiring direction and guidance. Simultaneously, episodic memories of nature immersion promoted an enduring transformation of their leadership styles.

Research limitations/implications – The findings cannot be blindly generalized as referring to all leaders. The leaders in this study are a subset of leaders who are inclined towards personal growth and leadership development. It is challenging to motivate leaders unkeen on changing to achieve better leadership.

Practical implications – This study indicates that the inclusion of emotional concepts to address the root causes of learning among leaders might be the most promising way to innovate leadership development.

Originality/value – The present study makes a novel contribution to relevant literature by examining leadership transformation through episodic remembrance of leaders' experiences in nature.

Keywords Leadership development, Authentic leadership, Episodic memory, Wilderness experiences

Paper type Research paper

Introduction

A survey encompassing 2,500 business and Human Resources leaders in 94 countries suggested that the amplification of leader development was rated as urgent by 86% of respondents (O'Leonard and Krider, 2014). Increasingly complex societies present volatile and unpredictable operating conditions for leaders. Accordingly, scholars have investigated the required capabilities for current leadership practices (Antonakis and Day, 2018; Baron and Parent, 2015; Day *et al.*, 2009; Ibarra *et al.*, 2010).

Current leaders operate in a context of globalization, digital disruption, technology mediated environments, accelerating pace of change, uncertainty and changing demands of employees (Bennett and Lemoine, 2014; Deal *et al.*, 2010; Fry, 2015). These contemporary challenges demand more than merely change in leadership competences. Rather, scholars and practitioners suggest a more fundamental shift in mindset (Cooper *et al.*, 2015; Day and Dragoni, 2015; Keller and Schaninger, 2019). At the same time, leadership development is largely based on cognition-based learning to improve competences – skills and abilities (skillset) – rather than addressing the capacities of leaders – their inner resources (mindset) in

the face of the complex leadership challenges (Day and Dragoni, 2015). Yet, changing mindsets is not easy and needs training different than competency-focused programs (Dweck, 2017; Kramer, 2016). How a change in leadership style has been perceived by leaders is central to the present study and is addressed by analyzing the impact of memories of a wilderness-based training program on leadership transformation.

Authentic leadership and wilderness

Against the backdrop of changing demands for leadership, the societal and academic focus has shifted to leaders who are optimistic, inspiring, empathetic, authentic, show integrity, take care of others and are able to reflect on themselves (Avolio and Luthans, 2006; Brown et al., 2005; George, 2003; Lorenzi, 2004). Specifically, the concept of authentic leadership has been introduced to represent this desired leadership style (Avolio and Gardner, 2005; Gardner et al., 2005; George and Sims, 2007; Luthans and and Avolio, 2003; Walumbwa et al., 2007). Authentic leaders are guided by sound moral convictions and act according to their deep-rooted beliefs, even under pressure. They are attuned to their self-image, strengths, weaknesses, and how their leadership influences peers and followers (Gardner et al., 2005; Walumbwa et al., 2007). The technical conceptualization of authentic leadership comprises four core components: self-awareness, an internalized moral perspective, balanced processing of information, and relational transparency (Avolio et al., 2009b). These leadership traits are more conducive to address contemporary challenges.

Research demonstrates that leadership interventions can have intended positive outcomes pertaining to leadership effectiveness (Avolio et al., 2009a; Collins and Holton, 2004; Day et al., 2014; Lord and Hall, 2005), Empirical studies suggest that outcomes include relevant capabilities, as well as leader self-images in the forms of self-awareness, self-efficacy, and leader-identity (Day and Dragoni, 2015; Murphy and Johnson, 2011).

While a large body of research reveals that leadership interventions have impacts, *how* these effects are actualized is important as this may clarify differences between intervention designs. Various scholars mention that interventions, such as "critical life events," – trigger events that shape people's lives – are probably a significant antecedent of authentic leadership (Cooper et al., 2005; Gardner et al., 2005; Lord and Hall, 2005; Luthans and Avolio, 2003). Trigger events can induce both dramatic and subtle changes in people's perspective and circumstances, and facilitate personal growth and development (Gardner et al., 2005, p. 347). Thus, trigger events can affect mindsets (Bennis and Thomas, 2002; Isabella, 1992; Turner and Mavin, 2008). The interaction between trigger events initiated by a leadership development program, and reflection on this and the insight gained, for example through coaching, could generate changes in leadership style (Avolio and Gardner, 2005; Illies et al., 2005). Typically, the subjective experience of trigger events can enable leaders to reflect upon self-concept, beliefs, and emotions. In addition, trigger events can define anchor points in leaders' minds, hence in their memory, from which their leadership approach is guided, and identity develops and grows (Turner and Mavin, 2007).

The present study addresses the question in the context of a wilderness-based training program. Wilderness is defined as remote and pristine areas that meet the characteristics of environments that contribute to attention restoration, as suggested by Kaplan and Kaplan (1989): To be away (distance from the world of everyday pressures and obligations); fascination - (effortless aesthetic appreciation); size (connectedness, sense of depth and continuity); and compatibility (a sense of fitting in or easy interaction with the environment). Previous research on the same program suggests that peak experiences, gained during the wilderness-based program, triggered intentions to change future leadership behaviors toward authentic leadership (Van Droffelaar and Jacobs, 2017). The study suggests that participants' peak experiences triggered intentions to be more aware of self, to live by their

inner compass, to improve careful listening, and to become more transparent. These intentions closely resonate with the core components of authentic leadership. The concept of authentic leadership emphasizes self-awareness, internalized moral perspective, balanced processing and relational transparency as key components of contemporary good leadership styles (Avolio and Gardner, 2005; Avolio *et al.*, 2009b). A follow-up study used an experimental design with longitudinal measurements to test lasting intrapersonal change toward authentic leadership. All components significantly improved (Cohen's *d* approx. 0.7) following the wilderness-based training program to such extent that further research was merited. The findings demonstrated that the training program leads to changes in leadership style lasting at least a year (Van Droffelaar and Jacobs, 2018).

As a theoretical necessity, effects of training interventions are brought about through participants' memories. If training programs do not leave traces in the brains of participants, effects cannot occur. Building on this premise, the present study examines (1) the types of work situations that prompt participants to recall memories of a wilderness-based leadership training program, (2) what the content of those memories is, and (3) which leadership attitudes and behaviors are inspired by those memories.

Literature review
Memory
The process of remembrance implies information retention or other mental dispositions, such as feelings (Bear *et al.*, 2016). Various types of memories have been distinguished in memory theory and research, such as explicit (or declarative) memory and implicit (or non-declarative) memory (Kandel, 2006). Explicit memory describes the intentional recollection of facts and events (Schacter and Wagner, 2013), whereas implicit memory utilizes past experiences to remember occurrences unconsciously, influencing thoughts and behaviors (Bear *et al.*, 2016; Schacter, 1987).

Explicit memory is subdivided into semantic and episodic memories (Ryan *et al.*, 2008; Tulving, 2002). Semantic memory consists of knowledge and beliefs and is independent of contextual information, such as where the concept is learned (Clark, 2018). Conversely, episodic memory incorporates the specific context of personally experienced events, including concepts regarding time and spatial representations (Hunsaker *et al.*, 2008). An example of semantic memory is the knowledge that an elephant is a mammal. In contrast, episodic memory incorporates the specific context of personally experienced events. Episodic memories typically include concepts regarding time and spatial representations (e.g. the personal encounter with an elephant in the Umfelozi river early that particular morning) (Hunsaker *et al.*, 2008). In day-to-day language, "knowing something" reflects semantic memory and "remembering something" reflects episodic memory.

Experiences are usually immediately forgotten; only some experiences and aspects of those experiences become part of people's memories (Reisberg and Heuer, 2004). Episodic memory involves recalling the spatial-temporal context of an original, most often first-time experience (Conway, 2005; Tulving, 2002). It is personal, emotional, imbued with detail, and involves "players" and specific places (Ryan *et al.*, 2008). Specifically, emotion-laden experiences constitute episodic memories (Clark, 2018; Hermans *et al.*, 2014; McGaugh, 2002) that inform self-identity, purpose, and the direction of decisions (McLelland *et al.*, 2015; Pillemer, 2003).

Central life events are usually infused with emotion, both at the time of experience and while reminiscing (LeDoux, 1992; Phelps, 2004; Reisberg and Heuer, 2004). The remembrance of an emotional event (i.e., episodic memory) often involves rich representations of the original experience (McLelland *et al.*, 2015; Tulving, 2002).

Also, frequent retrieval (i.e., rehearsal) of episodic memories enhances accessibility patterns, increasing the emotional and cognitive content of the events (Conway, 2009).

A striking feature of the biology of emotion-laden episodic memory is a dependence on the amygdala, a critical structure in emotional perception (Dolan, 2002). The role of the amygdala in episodic memory extends beyond coding processes, as evidenced by the fact that this structure is also involved in retrieving emotional items and contexts (Dolan, 2002; McLelland *et al.*, 2015; Phelps, 2004). Hence, the directive force of episodic memory is often potent when individuals are confronted with new situations that are structurally similar to the original episode recorded in memory (Kuwabara and Pillemer, 2010; Pillemer, 2003).

Wilderness experiences and episodic memory
Wilderness-based experiences may have the potential to produce episodic memories. Research indicates that wilderness experiences are conducive to heightened sensory awareness, peak and flow experiences, and deep interpersonal interactions (D'Amato and Krasny, 2011; Frederickson and Anderson, 1999; Heintzman, 2009; Hinds, 2011; Van Droffelaar and Jacobs, 2017; Zelenski and Nesbit, 2012). Wilderness immersion can create impactful emotional experiences, constituting episodic memories that act as significant life events. (Boniface, 2000; Csikszentmihalyi, 1990; Maslow, 1964; McDonald *et al.*, 2009). Still, conceptual and experimental explorations of conditions and design features that provide appropriate intervention settings for a shift in mindsets are rare. The present study bridges this gap by scrutinizing the impact of leaders' episodic memories of a wilderness-based training program on leadership transformation.

This study targets episodic memories to examine the consequences of participation in a wilderness-based leadership training program, addressing the following research questions:

(1) Which work situation characteristics evoke leaders' memories of wilderness experiences?

(2) What was the nature of the leaders' episodic memories?

(3) What changes did leaders perceive in their leadership style due to their episodic memories of wilderness events?

Methods
Semi-structured interviews were conducted with participants of a nature-based training program. Qualitative data are feasible for studying meanings in real-world settings (Miles *et al.*, 2014; Patton, 2002).

Context
Individuals participating in the Wilderness Leadership Transformation Program of the Foundation for Natural Leadership (FNL), based in the Netherlands, were interviewed. The program comprises a four-to-six-day nature-based training session wherein participants are fully immersed in the wilderness. Altogether, five to seven participants accompanied by one or two local guides and a certified FNL facilitator constituted training session groups. The training program aimed to develop participants' "natural leadership" behavior through hikes in remote places without human-made facilities, taking only a backpack containing a sleeping bag and food. Trails are organized in remote areas of Europe (Switzerland, Spain, and Ireland) and Africa (South Africa and Botswana). Participants experience extended periods of solitude, which facilitates self-reflection, sharing life stories and experiences, and one-to-one conversations. After the exercise, each participant and facilitator evaluated the event as well as the commitments and intentions that emerged. After two months, the participants met to share how their commitments and intentions were put into practice. Furthermore, ongoing

group meetings, peer-to-peer counseling, and personal coaching were continued thereafter. During such sessions, memories are revived, and the effects of the training are discussed. The time format is built on the notion that effective leadership development demands long-term trajectories (Cooper *et al.*, 2005; Eich, 2008; Kets de Vries and Korotov, 2007).

Sample
In total, 36 participants were sampled from among 435 participants of FNL wilderness programs arranged between 2006 and 2014. Purposive sampling was used to ensure diversity in terms of occupation and time since participation (Sharma, 2017). In the first stage, participants were assembled according to the number of years since their last participation. In the second stage, people with a variety of occupations were selected from each group, including Chief Executive Officers (CEOs) (13), business/departmental directors (14), entrepreneurs (4), and consultants (5). A majority attended programs in Africa (i.e., South Africa and Botswana; 32 participants) and some visited Europe (the Alps and Ireland; 4 participants). The sample broadly reflects the distribution of the total sample of participants. All selected participants were approached via email, requesting their participation in a study on the impact of wilderness experiences. None of the respondents refused to be interviewed. The sample consisted of 8 women and 28 men.

Data collection
The interviews lasted between 40 and 60 minutes and were conducted at a place chosen by the respondent to provide a comfortable setting. Many participants (34) preferred their premises, and two participants were interviewed over the phone as they lived abroad. The protocol consisted of an introduction stating the purpose and course of the interview, basic interview questions (Table 1, a list of subsequent questions designed to encourage the interviewees to speak openly without introducing a new subject (e.g. "Could you elaborate a little bit on this?" or "What do you mean when you say. . . ?"), and the conclusion. The interviewees did not report difficulties in understanding the questions. Interviews were recorded and transcribed verbatim.

Analysis
Qualitative data analysis implies minimizing the complexity of raw data through descriptive summaries on an abstract level (Patton, 2002). The process involves formulating concepts that represent the content of texts (Hsieh and Shannon, 2005), and subsequently assigning codes (representing these concepts) to quotes (distinctive sentences in the text). The analysis

Component	Interview question
Work situations	In which work situations do you recall your wilderness experiences?
	How do you characterize these situations?
	What triggers you to recall your key wilderness experiences in work situations?
	How often do you reflect on your key wilderness experiences?
Episodic memories	What do you remember of your key wilderness experiences?
	How do you characterize such experiences?
	How important are these memories?
	To what extent are your memories laden with emotion?
Leadership style change	What has been the impact of your memories on your leadership style?
	How enduring is the change in your leadership style?
	What was the feedback from your environment?

Table 1.
Interview questions

consisted of six steps. In the first step, each transcript was read and reread to comprehend the raw interview material. The second step identified 674 distinctive phrases or excerpts expressing a discrete thought or idea. In the third step, each phrase was labeled with an initial open code, indicating the meaning of the phrase in terms of a summarizing abstract expression. As such, a first codebook was developed based on a bottom-up, data-driven interpretation (i.e., semantic and substantial coding). *A priori*, the coding outcomes were segmented into three concepts: work situations, memories, and perceived changes. The fourth step entailed a revision of the initial codebook through several iterations. Initial codes and underlying texts were compared and eventually merged or subdivided. Iterations stopped when the revised codebook meaningfully and efficiently reflected the variety of work situation characteristics, episodic memories, and perceived changes in leadership style. During the fifth step, each of the 674 phrases was coded using the final codebook. Inter-coder reliability test was conducted in the sixth step, where in two researchers independently coded a sample of phrases. κ was employed as the statistical estimate of the agreement between the coders and was 0.71 for work situations, 0.69 for episodic memories, and 0.72 for perceived changes in leadership style. The outcomes confirm a "good" inter-coder reliability (refer to Landis and Koch, 1977).

Results
Work situation characteristics that evoke memories
Notably, one-on-one contact with peers and followers was a situation that evoked the most memories (i.e., approximately 50%; see Table 2). Specifically, a personal contact imbued with emotions recalled the most memories. For instance, in situations where a deadline had to be fulfilled, one interviewee responded:

> I automatically think about the trail when more difficult situations arise at work in terms of relationships with my people or when anxiety arises to reach a specific milestone and complaints about unrest and work pressure emerge. (CEO, IT company)

Nearly 30% of the participants stated aspects of work situations, such as dealing with stressful situations, that evoked memories of peak experiences from the program. Interviewees mentioned situations during work where they dealt with opposition and negative feelings. For example, one interviewee responded, "*When I have a difficult meeting, where I have to persuade my people to accept new realities.*" *(Director, Software company).* Others mentioned situations wherein they had to cope with high pressure and gaining overview. An interviewee said, "*When under great work stress, I am actively looking to put things into perspective*" *(Entrepreneur).*

Additionally, about 20% of interviewees conveyed that their memories were triggered by certain types of challenging work situations (e.g. preparing and giving presentations for group meetings). A participant recalled the following situation:

Position	Work situations			Reliving memories			Frequency remembering	
	Aroused meetings	Tense one-on-one	Personal challenges	Solitude	Councils	Nature	Daily	Weekly
CEO	4	5	4	5	3	5	7	6
Director	4	7	3	5	–	9	5	9
Entrepeneur	2	2	–	2	1	1	1	3
Consultant	1	3	1	3	–	2	3	2
	11	17	8	15	4	17	16	20

Table 2.
Category frequency work situations and memories (absolute numbers)

A big conference was organized in America and I really wanted to do things differently. The remembrance gave me inspiration and courage. (Director, R&D)

Around 30% of the interviewees relied on memories during brainstorming sessions and when creativity was needed to explicate complex issues. An interviewee stated, "*Memories arise during team sessions while brainstorming*" *(Director).* Another responded, "*When preparing for important meetings and telling my personal story using metaphors*" *(CEO).* The characteristics of work situations that evoked memories typically included other people and stress.

Furthermore, memories of experiences from the training program were frequently recalled. Around 40% of the respondents reported that they thought about their wilderness experiences almost daily and the remaining relived it every week.

Moments concerning episodic memory
Experiencing solitude was cited as an unforgettable moment during training by approximately 30% of the interviewees. Solitude experiences included reflecting on a rock near the river or sitting alone by the fire during the night watch, while listening to all the sounds of the wilderness. A participant described an impressionable moment as follows:

I sat near the campfire and all I had was my flashlight, and I literally heard lions' roar. I did not need anything else. (Consultant)

Another interviewee recalled an old tortoise coming up next to him during 48 hours of solitude. The experience confirmed his firm decision to start a second company. In his words:

At one point, I thought, "Yes, I know what to do." I opened my eyes and next to me was an 88-year-old tortoise who was nodding his head. (Entrepreneur)

Feeling a connection with nature was another memorable moment mentioned by almost 50% of the interviewed leaders. An interviewee reminisced, "*an overwhelming sunrise during night-watch, with a rhino just ten meters away, all-in harmony*" *(Consultant).* The interviewees experienced sharpened senses and were one with nature. Another interviewee responded in the following manner:

I was getting more and more . . . Becoming one with nature, or at least I became open to it. My senses picked up more things. That is very beautiful.

When I was in that nature, I experienced how, on the one hand, I am incredibly small and invalid. But also how strong, in one way or another. Because I really felt I was part of nature *(CEO, Energy company)*

Yet, another interviewee recalled quietly waking up in a peaceful landscape. He reported seeing the animals approaching and realized that when one is quiet, also people tend to open up. Another interviewee described two mountains that looked more or less like a gate, and how this image came to symbolize a gateway to something new:

I see myself walking there, not so much sitting down, but I see myself struggling up the mountains. I see many images. I see us walking and witnessing two mountains that resembled a gate. A painting depicting this scene hangs above my desk at home, signifying an entrance to something new and vast. (CEO, Technical Trade company)

Peer-to-peer counseling, mentioned by approximately 20% of the interviewees), refers to moments of sitting together in a circle and sharing experiences. In particularly, the emotional moments shared through life stories left indelible impressions and interviewees suddenly realized that everybody is equal. These moments enhanced mutual trust among the participants. When asked what he remembered best, an interviewee responded:

Also, the narratives of other people deeply moved me, and have some kind of relativizing effect on your situation. I found that the integrity with which we interact makes a deep impression, creating a safe space where you share your stories in a setting that is purifying. (CEO, Healthcare)

Overall, participants relied on detailed personal, important, and emotion-laden moments from the wilderness-based training.

Perceived change in leadership style
Interviewees believed that their wilderness experiences influenced their leadership style permanently. Perceived changes included a shift in consciousness, peace of mind, increased self-confidence, and open interconnectedness with peers and followers. Table 3 provides the distributions of the perceived changes in leadership.

The shift in consciousness, mentioned by more than 35% of the interviewees, entails an expanded, deeper awareness of what matters, leading to a more open and inclusive worldview. The importance of the balance between humans and nature, as well as their influence on others, was acknowledged. An interviewee expressed:

So, then I realized that human beings and nature, this is what we are raised to believe, that we are enemies. Everywhere people come, it's at the expense of nature. And there I realized, you know, it can in fact be very beautiful. The balance between man and nature [. . .]. And yet another important insight, which is again deepened, is that we have a huge task as human beings, because of course we live, as many animals live, at the expense of something else. And for my company? An even more explicit agenda for sustainability. (CEO, Civil Building company)

In addition, interviewees perceived that their egos had become less important to them.

Ever since I experienced wilderness, I have become more serviceable than I was before. This process is still evolving as the ego dissipates. Others sometimes tell me that I am now a better listener. (Consultant)

Peace of mind, mentioned by 25% of the participants, refers to being in a mental state of calmness or tranquility. Training participants have experienced this state during the wilderness experience and the memory has stayed with them since. An interviewee mentioned: "*The silence and rest in the mountains have given me inner calmness, an earthed feeling*" *(Director, Broadcasting company)*. At stressful moments, leaders that had participated could retrieve memories of peaceful trail experiences, inducing a state of calmness and overview. For example, an interviewee had learned to incorporate moments of reflection in stressful moments, using his memory:

We hurried along until we saw the buffaloes, then we had time to spare of course. Those kinds of moments I still remember, they come up just like that. [. . .] But . . . at times, I can really throw myself into things and start running things quickly, saying "hey, you're not doing things right". And it is difficult to switch off that mode. When I realize that I'm not doing thing right, then I go back to that feeling of rest, and then I come back from my pitfall. (Director), Ministry of Infrastructure.)

| Position | Perceived leadership change | | | |
	More consciously present	More peace of mind	Increased self-confidence	Better inter-connectedness
CEO	7	2	1	3
Director	2	5	5	2
Entrepeneur	2	1	1	
Consultant	2	1	2	
	13	9	9	5

Table 3.
Category frequency perceived leadership change (absolute numbers)

Another 25% of the interviewees expressed an increase in self-confidence as they had more trust in their own abilities, capacities and decisions to face day-to-day challenges and demands. They deliberately take moments to reflect, rely on their intuition, and stick to their beliefs. As one participant responded:

> In business, of course, and certainly in higher positions, you often have those dominant or narcissistic types, and then I did not dare anymore. And now, with the trail experiences in mind, I have something like: "Yes, but you know, I can also say what I think". So, then I noticed: "Ah yes". You know, it works. And that's just, yes, now I have the courage to speak up and see that other people are really interested in what I have to say. (Marketing Director, Food company)

Open interconnectedness, mentioned by almost 15% of the interviewees, refers to revealing real thoughts, feelings, and deep connections with others. Interviewees noticed that they chose to show their vulnerability more often. They also invited followers to be open and vulnerable and were more able to sense what was going on and listen without judgment. An interviewee expressed this change by saying:

> This experience had a significant impact. I talk about my feelings more often, but now I realize how important space is for people as they instantly give you the space to do your thing. I also have a much wider antenna now, with a huge spectrum for signals. (CEO, Design company)

Another leader indicated that he now regularly meets with his management team, sitting in a circle, without an agenda. Instead of giving directions, he asks only two questions: "*What is going on here? What is your advice for me?*" *(CEO, Energy company).* Another interviewee invited his employees to a walk when facing a real problem. Before the trail event, he always chose the route. Now, he perceives himself as more of a "shepherd behind the flock" *(CEO, Service company).*

Over 70% of interviewees reported receiving positive feedback from their peers and employees on their perceived change in leadership style. As one interviewee expressed: "*Yes, from the moment I got back from the trail, people said that I radiated a certain calmness and that I take moments to reflect*" *(CEO, Food Company).*

Conclusion and discussion

This study examined work situations evoking leaders' memories of a wilderness-based training program and changes in leadership style. Altogether, 36 leaders were interviewed.

The results specify that work situations evoking memories of wilderness experiences can be characterized as involving tense personal contacts, stressful occurrences, and challenging moments. Amid tense work situations, episodic memories are daily or at least weekly relived in great detail. This study indicates that leaders' episodic memories of wilderness-based training involve moments of solitude, a deep connection with nature, and peer-to-peer counseling. Thus, episodic memories of wilderness experiences can adequately deal with challenging work situations involving peers and followers.

The present study indicates that not only direct nature experiences, but also episodic memories of nature experiences can be meaningful to individuals. Hence, the present study makes a novel contribution to the literature demonstrating that under emotional pressure and psychological stress, such episodic memories can have a positive influence on actual leadership behavior.

Furthermore, the findings suggest that participants considered these episodic memories as impactful on their attitude towards leadership and leadership behavior and led to an enduring transformation to a more authentic leadership style. Notably, the interviewed leaders participated in a wilderness-based training program an average of six years before the interview and still frequently recalled their memories. As repeated retrieval (rehearsal) of episodic memories enhances patterns of accessibility (Conway, 2009), it seems that not only

an emotion-laden character but also the rehearsal of wilderness memories may contribute to an enduring leadership transformation process.

The present study expands current insights into leadership development. Previous research has predominantly addressed specific outcomes of interventions, such as task performance, job satisfaction, or persuasiveness (see Aviolo *et al.*, 2009a). Other research referred to "critical life events" (i.e., transformative experiences that shape people's lives) as antecedents for leadership development (Bennis and Thomas, 2002; Gardner *et al.*, 2005; Lord and Hall, 2005). Generally, these studies analyzed critical work situations that facilitated leaders' leadership abilities. Contrarily, the present study makes a novel contribution to leadership literature by examining leadership transformation through leaders' remembrance of their experiences in pristine nature, in which they had been radically removed from their comfort zone. Nearly all interviewed leaders perceived their wilderness experience as a critical life event that changed their attitudes and behaviors. Especially during moments requiring effective leadership capabilities, interviewees indicated that retrieving episodic memories of meaningful wilderness experiences provided direction and guidance. Further, the findings of this study provide novel environmental psychological knowledge about the impact of nature immersion, such as stress reduction (Bratman *et al.*, 2012; Kaplan, 1995; Ulrich *et al.*, 1991) and restored attention (Berman *et al.*, 2008; Cole and Hall, 2010).

Limitations
The findings suggest avenues for future research. First, this type of qualitative research should be conducted with a wider population of leaders known to have profound wilderness experiences. The sample in this study only incorporated leaders from organizations based in the Netherlands, which has a specific organizational culture (i.e., egalitarian) (Hofstede, 2001). It would be interesting to examine the involvement of leaders from other countries with different organizational cultures. Second, the interviewed leaders were unacquainted before they participated in the wilderness-based training program. Future research should concentrate on leaders who know each other, such as whole manangemnt teams. Wilderness trails with familiarized management teams are organized, so it is possible to conduct such a study. Third, it would be compelling to explore the impact of leaders' participation in nature-based training on employees, teams, and organizational outcomes.

Another limitation of the current research is that the sample constitutes of leaders who consciously made the choice to invest in their personal growth and leadership development by participating in a wilderness-based training program; in other words, people characterized by developmental readiness (Hannah and Avolio, 2010). Hence, findings cannot be blindly generalized as referring to all leaders. On the other hand, the leaders in this study are a subset of leaders who are open to personal growth and leadership development. It is hard to imagine how leaders who do not want to change can be motivated to better leadership (Day and Thornton, 2018; George and Sims, 2007).

Moreover, it was impossible to interview participants before the leadership program to investigate longitudinal effects. Finally, the study advocates more empirical, longitudinal research on transformational management education (Kets de Vries and Korotov, 2007), which can direct management decisions concerning leadership development options and the design of leadership transformation programs. For instance, by incorporating in leadership curricula a guided stay in pristine nature with hikes, life-story sharing and moments of solitude.

Implications
Theoretical implications
Emotions flag what is important and meaningful to us. Substantial evidence indicates that emotions have a powerful influence on cognitive processing (Izard, 2009; LeDoux, 1992;

Pessoa, 2013; Phelps, 2004), such as through motivation (Izard, 2009), attention (Öhman *et al.*, 2001), perception (Dolan, 2002), learning and memory (Kandell, 2006; LaBar and Cabeza, 2006; Reisberg and Heuer, 2004), and attitude formation (Ajzen, 2005; Fishbein and Ajzen, 2010). Typically, emotions associated with a past event which, having been tagged in the mind as important, can inform present feelings, thoughts, and actions (Pillemer, 2003). Hence, emotional experiences should be acknowledged as mechanisms that provoke insights, facilitate change, enable learning, and alter intentions, mental dispositions and behaviors.

The outcomes of this paper emphasize the emotional content of experiences and memories. When participants describe their peak experiences during the trail, they often do so in terms of suggesting underlying emotions. Peak experiences are positive, emotionally and cognitively intense, prominent, and can fuel lasting changes among individuals (Maslow, 1964). This appears from participants' descriptions of states of pleasure (experiences of emotion), such as feeling reborn and alive. Participants remember being deeply moved by the significance of carefully observing and listening to nature and other participants, experiencing the pleasure of being "here-and-now" ("...*I felt cleansed, reborn, quiet and incredibly strong*..."), and fully present ("...*really giving attention to the person, the thought, what it brings forward in all its senses, like in nature*..."). During the interviews, participants relied on personal, important, and emotion-laden moments. For instance, they recalled an experience of solitude and feelings of a deep connection with nature ("...*an overwhelming sunrise during night-watch, with a rhino just ten meters away, all in harmony*...").

The findings suggest that interviewees considered emotional experiences to be particularly important in changing their leadership style, deepening their self-awareness, securing peace of mind, increasing self-confidence, and more open interconnectedness. While feeling the importance of nature, participants perceived that their ego had become less important to them ("...*you know, the ego moves to the background... Others tell me that I am a better listener now*"). They remarked that the emotional experience of calmness and tranquility had given them lasting peace of mind ("*The silence and rest in the mountains have given me an inner calmness, a grounded feeling*"). The emotional experience of candid conversations led participants to show their vulnerability more often to others in work situations ("*I talk about my feelings a lot more, and that has a huge impact*"). Collectively, empirical support not only confirms that emotional experiences change mental dispositions and behavior but also suggests that emotional experiences may have implications for a profound change in leadership style.

Practical implications

Research in other domains demonstrates the importance of emotion in learning processes and that memories evoke intentional or behavioral changes. For instance, there is an emerging body of educational research concerning children and students arguing that emotional events can initiate and catalyze learning processes (Immordino-Yang and Damasio, 2007; Immordino-Yang *et al.*, 2019). Hence, there is merit in discussing the role of emotions in leadership and leadership development in terms of research, theory, and practice.

Primarily, theoretical perspectives on leadership and its effect have focused on three themes: displays of emotions and processes (e.g. contagion, emotional labor), emotion-related abilities (e.g. emotional intelligence, positive and negative affectivity), and the effects thereof on their followers, or groups of followers (Boyatzis, 2008; Gooty *et al.*, 2010; George, 2000). Furthermore, meta-analytic reviews on leadership and emotion (Gooty *et al.*, 2010; Rajah *et al.*, 2011) have been limited to the role of emotions in workplace settings.

However, with little room for emotion, leadership development programs predominantly opt for cognition-based trajectories, and again, mostly in workplace/classroom settings (Day and Dragoni, 2015; Gurjian *et al.*, 2014; Kaiser and Curphy, 2013). A meta-analytical review of 200 empirical studies regarding the impact of leadership interventions suggested a

66% probability of achieving a positive result without providing any clues as to whether emotional experiences have an educational role in leadership interventions (Avolio *et al.*, 2009a); neither did other meta-analyses (Collins and Holton, 2004; Powell and Yalcin, 2010; Taylor *et al.*, 2009). Similarly, a more recent meta-analysis of 335 samples (Lacerenza *et al.*, 2017) provided an estimate of the effectiveness of leadership training across a wide span of years (1951–2014) and organizations. Their analysis indicated that leadership training is effective in improving affective, cognitive, and skill-based outcomes. Therefore, researchers suggested that the most effective training programs incorporate all three cognition-based delivery methods (i.e., information-, demonstration-, and practice-based methods) preferably conducted at an on-site location. Only once did they mention that "future research should investigate whether affective content can improve affective results to a greater extent" (p. 1701). Thus, the role of emotions in leadership training is seldom discussed, and there is a dearth of findings regarding the use of emotions to guide research on leadership development. Hence, how leaders may develop their leadership capacities through emotional experiences remains unanswered, suggesting that perhaps the most effective way to innovate leadership development is utilizing emotion to address the root causes of learning among leaders.

Another practical implication for human resource development (HRD) professionals and designers of leadership training programs is that the integration of emotion concepts in training programs may have a significant role in changing leadership style. An additional practical implication for HRD is the consideration of how organizational systems encourage emotional transparency through leaders. For example, HRD professionals might consider the extent to which engagement in emotional transparency is promoted among leaders within the work systems and processes of the organization, and how insights regarding emotion concepts are incorporated within organizational change initiatives.

The current discussion leads to conceptual and practical implications for understanding or improving the effectiveness of leadership development. Another implication of this study is that it depicts the potential of emotion in leader development. It not only suggests that emotion plays a significant role in leadership development but also states that through relived emotions, development itself may persist over multiple years. This work could represent a theoretical understanding that can be used to assess and develop emotion-based leadership development. Thereby, it opens new avenues for future research. One obvious direction for future research would be to examine the validity of the framework of emotion concepts for effective leadership development. Such research may help extend the research agenda associated with leadership and emotional intelligence, contagion, and emotional labor, to include leader development in relation to emotion concepts.

References

Ajzen, I. (2005), *Attitudes, Personality, and Behaviour*, McGraw-Hill Education, Maidenhead.

Antonakis, J. and Day, D.V. (2018), "Leadership: past, present, and future", Antonakis, J. and Day, D.V. (Eds), *The Nature of Leadership*, SAGE Publications, Thousand Oaks, CA, pp. 354-380.

Avolio, B.J. and Gardner, W.L. (2005), "Authentic leadership development: getting to the root of positive forms of leadership", *The Leadership Quarterly*, Vol. 16 No. 3, pp. 315-338.

Avolio, B.J. and Luthans, F. (2006), *High Impact Leader: Moments Matter in Accelerating Authentic Leadership*, McGraw-Hill, New York, NY.

Avolio, B.J., Reichard, R.J., Hannah, S.T., Walumbwa, F.O. and Chan, A. (2009a), "A meta-analytic review of leadership impact research: experimental and quasi-experimental studies", *The Leadership Quarterly*, Vol. 20 No. 5, pp. 764-784.

Avolio, B.J., Walumbwa, F.O. and Weber, T.J. (2009b), "Leadership: current theories, research, and future directions", *Annual Review of Psychology*, Vol. 60, pp. 421-449.

Baron, L. and Parent, E. (2015), "Developing authentic leadership within a training context: three phenomena supporting the individual development process", *Journal of Leadership and Organization Studies*, Vol. 22 No. 1, pp. 37-53.

Bear, M., Connors, B.W. and Paradiso, M. (2016), *Neuroscience. Exploring the Brain*, 4th ed., Wolters Kluwer, Amsterdam.

Bennett, N. and Lemoine, G.J. (2014), "What a difference a word makes: understanding threats to performance in a VUCA world", *Business Horizons*, Vol. 57 No. 3, pp. 311-317.

Bennis, W.G. and Thomas, R.J. (2002), "Crucibles of leadership", *Harvard Business Review*, Vol. 9, pp. 5-11.

Berman, M.G., Jonides, J. and Kaplan, S. (2008), "The cognitive benefits of interacting with nature", *Psychological Science*, Vol. 19 No. 12, pp. 1207-1212.

Boniface, M.R. (2000), "Towards an understanding of flow and other positive experience phenomena within outdoor and adventurous activities", *Journal of Adventure Education and Outdoor Learning*, Vol. 1 No. 1, pp. 55-68.

Boyatzis, R.E. (2008), "Leadership development from a complexity perspective", *Consulting Psychology Journal: Practice and Research*, Vol. 60 No. 4, pp. 298-313.

Bratman, G.N., Hamilton, J.P. and Daily, G.C. (2012), "The impacts of nature experience on human cognitive function and mental health", *Annals of the New York Academy of Sciences*, Vol. 1249, pp. 118-36.

Brown, M.E., Treviño, L.K. and Harrison, D.A. (2005), "Ethical leadership: a social learning perspective for construct development and testing", *Organizational Behavior and Human Decision Processes*, Vol. 97 No. 2, pp. 117-134.

Clark, R.E. (2018), "Current topics regarding the function of the medial temporal lobe memory system", in Clark, R.E. and Martin, S.J. (Eds), *Behavioral Neuroscience of Learning and Memory, Current Topics in Behavioral Sciences*, Vol. 37, pp. 13-42.

Cole, D.N. and Hall, T.E. (2010), "Experiencing the restorative components of wilderness environments: does congestion interfere and does length of exposure matter?", *Environment and Behavior*, Vol. 42 No. 6, pp. 806-823.

Collins, D.B. and Holton, E.F. (2004), "The effectiveness of managerial leadership development programs: a meta-analysis of studies from 1982 to 2001", *Human Resource Development Quarterly*, Vol. 15 No. 2, pp. 217-248.

Conway, M.A. (2005), "Memory and the self", *Journal of Memory and Language*, Vol. 53, pp. 94-628.

Conway, M.A. (2009), "Episodic memories", *Neuropsychologia*, Vol. 47 No. 11, pp. 2305-2313.

Cooper, C.D., Scandura, T.A. and Schriesheim, C.A. (2005), "Looking forward but learning from our past: potential challenges to developing authentic leadership theory and authentic leaders", *The Leadership Quarterly*, Vol. 16 No. 3, pp. 475-493.

Csikszentmihalyi, M. (1990), *Flow: The Psychology of Optimal Experience*, Harper and Row, NY.

D'Amato, L.G. and Krasny, M.E. (2011), "Outdoor adventure education: applying transformative learning theory to understanding instrumental learning and personal growth in environmental education", *The Journal of Environmental Education*, Vol. 42 No. 4, pp. 237-254.

Day, D.V. and Dragoni, L. (2015), "Leadership development: an outcome-oriented review based on time and levels of analyses", *Annual Review of Organizational Psychology and Organizational Behavior*, Vol. 2, pp. 33-156.

Day, D.V. and Thornton, M.A. (2018), "The nature of leadership development", in Antonakis, J. and Day, D.V. (Eds), *The Nature of Leadership*, SAGE Publications, Thousand Oaks, CA, pp. 354-380.

Day, D.V., Harrison, M.M. and Halpin, S.M. (2009), *An Integrative Approach to Leader Development: Connecting Adult Development, Identity, and Expertise*, Routledge, New York.

Day, D.V., Fleenor, J.W., Atwater, L.E., Sturm, R.E. and McKee, R.A. (2014), "Advances in leader and
leadership development: a review of 25 years of research and theory", *Leadership Quarterly*,
Vol. 25 No. 1, pp. 63-82.

Deal, J.J., Altman, D.G. and Rogelberg, S.G. (2010), "Millennials at work: what we know and what we
need to do (if anything)", *Journal of Business Psychology*, Vol. 25, pp. 191-199.

Dolan, R.J. (2002), "Emotion, cognition, and behavior", *Science*, Vol. 298 No. 5596, pp. 1191-1195.

Dweck, C.S. (2017), *Mindset*, Constable & Robinson, New York.

Eich, D. (2008), "A grounded theory of high-quality leadership programs", *Journal of Leadership and
Organization Studies*, Vol. 15 No. 2, pp. 176-187.

Fishbein, M. and Ajzen, I. (2010), *Predicting and Changing Behaviour: The Reasoned Action Approach*,
Psychology Press, New York, NY.

Frederickson, L.M. and Anderson, D.H. (1999), "A qualitative exploration of the wilderness experience
as a source of spiritual inspiration", *Journal of Environmental Psychology*, Vol. 19 No. 1,
pp. 21-39.

Fry, R. (2015), , "Millennials surpass Gen Xers as the largest generation in the U.S. labor force", Pew
Research Center, May 11, available at: http://www.pewresearch.org/fact-tank/2015/05/11/
millennials-surpass-gen-xers-as-the-largest-generation-in-u-s-laborforce/.

Gardner, W.L., Avolio, B.J., Luthans, F., May, D.R. and Walumbwa, F. (2005), "Can you see the real
me? A self-based model of authentic leader and follower development", *The Leadership
Quarterly*, Vol. 16 No. 3, pp. 343-372.

George, B. and Sims, P. (2007), *True North: Discover Your Authentic Leadership*, Jossey-Bass, San
Francisco, CA.

George, J.M. (2000), "Emotions and leadership: the role of emotional intelligence", *Human Relations*,
Vol. 53 No. 8, pp. 1027-1055.

George, B. (2003), *Authentic Leadership: Rediscovering the Secrets to Creating Lasting Value*, Jossey-
Bass, San Francisco, CA.

Gooty, J., Connelly, S., Griffith, J. and Gupta, A. (2010), "Leadership, affect and emotions: a state of the
science review", *Leadership Quarterly*, Vol. 21 No. 6, pp. 979-1004.

Gurjian, P., Halbeisen, T. and Lane, K. (2014), "Why leadership development programs fail", *McKinsey
Quarterly*, Vol. 1 No. 1, pp. 1-6.

Hannah, S.T. and Avolio, B.J. (2010), "Ready or not: how do we accelerate the developmental readiness
of leaders?", *Journal of Organizational Behavior*, Vol. 31 No. 8, pp. 1181-1187.

Heintzman, P. (2009), "The spiritual benefits of leisure", *Leisure/Loisir*, Vol. 33 No. 1, pp. 419-445.

Hermans, E.J., Battaglia, F.P., Atsak, P., De Voogd, L.D., Fernández, G. and Roozendaal, B. (2014),
"How the amygdala affects emotional memory by altering brain network properties",
Neurobiology of Learning and Memory, Vol. 112, pp. 2-16.

Hinds, J. (2011), "Exploring the psychological rewards of a wilderness experience: an interpretive
phenomenological analysis", *The Humanistic Psychologist*, Vol. 39 No. 3, pp. 189-205.

Hofstede, G. (2001), *Culture's Consequences: Comparing Values, Behaviors, Institutions and
Organizations across Nations*, SAGE Publications, Thousand Oaks, CA.

Hsieh, H.F. and Shannon, S.E. (2005), "Three approaches to qualitative content analysis", *Qualitative
Health Research*, Vol. 15 No. 9, pp. 1277-1288.

Hunsaker, M.R., Lee, B. and Kesner, R.P. (2008), "Evaluating the temporal context of episodic memory:
the role of CA3 and CA1", *Behavioural Brain Research*, Vol. 188 No. 2, pp. 310-315.

Ibarra, H., Snook, S. and Guillén Ramo, L. (2010), "Identity-based leader development", in Nohria, N.
and Khurana, R. (Eds), *Handbook of Leadership Theory and Practice*, Harvard Business School
Publishing Corporation, Boston.

Ilies, R., Morgeson, F.P. and Nahrgang, J.D. (2005), "Authentic leadership and eudaemonic well-being: understanding leader–follower outcomes", *The Leadership Quarterly*, Vol. 16 No. 3, pp. 373-394.

Immordino-Yang, M.H. and Damasio, A. (2007), "We feel, therefore we learn: the relevance of affective and social neuroscience to education", *Mind, Brain, and Education*, Vol. 1 No. 1, pp. 3-10.

Immordino-Yang, M.H., Darling-Hammond, L. and Krone, C.R. (2019), "Nurturing nature: how brain development is inherently social and emotional, and what this means for education", *Educational Psychologist*, Vol. 54 No. 3, pp. 1-20.

Isabella, L.A. (1992), "Managing the challenges of trigger events: the mindsets governing adaptation to change", *Business Horizons*, Vol. 35 No. 5, pp. 59-66.

Izard, C.E. (2009), "Emotion theory and research: highlights, unanswered questions, and emerging issues", *Annual Review of Psychology*, Vol. 60 No. 1, pp. 1-25.

Kaiser, R. and Curphy, G. (2013), "Leadership development: the failure of an industry and an opportunity for consulting psychologists", *Consulting Psychology Journal*, Vol. 65 No. 4, pp. 294-302.

Kandel, E.R. (2006), *In Search of Memory. The Emergence of a New Science of Mind*, Norton & Company, New York.

Kaplan, S. (1995), "The restorative benefits of nature: toward an integrative framework", *Journal of Environmental Psychology*, Vol. 15 No. 18, pp. 169-182.

Kaplan, S. and Kaplan, R. (1989), *The Experience of Nature*, Cambridge University Press, Cambridge.

Keller, S. and Schaninger, B. (2019), *Beyond Performance 2.0: A Proven Approach to Leading Large-Scale Change*, Wiley & Sons, Hoboken, NJ.

Kets de Vries, M.F.R. and Korotov, K. (2007), "Creating transformational executive education programs", *Academy of Management Learning and Education*, Vol. 6 No. 3, pp. 375-387.

Kramer, R. (2016), "From skillset to mindset: a new paradigm for leader development", *Public Administration Issues*, Vol. 5, pp. 26-45.

Kuwabara, K.J. and Pillemer, D.B. (2010), "Memories of past episodes shape current intentions and decisions", *Memory*, Vol. 18 No. 4, pp. 365-374.

LaBar, K.S. and Cabeza, R. (2006), "Cognitive neuroscience of emotional memory", *Nature Reviews Neuroscience*, Vol. 7 No. 1, pp. 54-64.

Lacerenza, C.N., Reyes, D.L., Marlow, S.L., Joseph, D.L. and Salas, E. (2017), "Leadership training design, delivery, and implementation: a meta-analysis", *Journal of Applied Psychology*, Vol. 102 No. 12, pp. 1686-1718.

Landis, J.R. and Koch, G.G. (1977), "The measurement of observer agreement for categorical data", *Biometrics*, Vol. 33 No. 1, pp. 159-174.

LeDoux, J.E. (1992), "Emotion and memory: anatomical systems underlying indelible neural trace", in Christianson, S.A. (Ed.), *The Handbook of Emotion and Memory: Research and Theory*, Lawrence Erlbaum Associates, Hillsdale, NJ, pp. 269-288.

Lord, R.G. and Hall, R.J. (2005), "Identity, deep structure and the development of leadership skill", *The Leadership Quarterly*, Vol. 16 No. 4, pp. 591-615.

Lorenzi, P. (2004), "Managing for the common good: prosocial leadership", *Organizational Dynamics*, Vol. 33 No. 3, pp. 282-291.

Luthans, F. and Avolio, B.J. (2003), "Authentic leadership development", in Cameron, K.S. Dutton, J.E. and Quinn, R.E. (Eds), *Positive Organizational Scholarship*, Berrett-Koehler, San Francisco, pp. 241-258.

Maslow, A. (1964), *Religions, Values, and Peak Experiences*, Ohio State University Press, Columbus, OH.

McDonald, M.G., Wearing, S. and Ponting, J. (2009), "The nature of peak experience in wilderness", *The Humanistic Psychologist*, Vol. 37 No. 4, pp. 370-385.

McGaugh, J.L. (2002), "Memory consolidation and the amygdala: a system perspective", *Trends in Neurosciences*, Vol. 25 No. 9, pp. 456-461.

McLelland, V.C., Schacter, D.L. and Addis, D.R. (2015), "Contributions of episodic memory to imagining the future", in Addis, R.A., Barense, M. and Duarte, A. (Eds), *The Wiley Handbook on the Cognitive Neuroscience of Memory*, Wiley-Blackwell, New York, pp. 287-308.

Miles, B.M., Huberman, A.M. and Saldaña, J. (2014), *Qualitative Data Analysis: A Methods Source Book*, SAGE Publications, Thousand Oaks, CA.

Murphy, S.E. and Johnson, S.K. (2011), "The benefits of a long-lens approach to leader development: understanding the seeds of leadership", *Leadership Quarterly*, Vol. 22 No. 3, pp. 459-470.

Öhman, A., Flykt, A. and Esteves, F. (2001), "Emotion drives attention: detecting the snake in the grass", *Journal of Experimental Psychology: General*, Vol. 130 No. 3, pp. 466-78.

O'Leonard, K. and Krider, L. (2014), *Leadership Development Factbook 2014: Benchmarks and Trends in US Leadership Development*, Bersin & Associates, Oakland, CA.

Patton, M.Q. (2002), *Qualitative Research and Evaluation Methods*, SAGE Publications, Thousand Oaks, CA.

Pessoa, I. (2013), *The Cognitive-Emotional Brain. From Interaction to Integration*, MIT Press, Cambridge, MA.

Phelps, E.A. (2004), "Human emotion and memory: interactions of the amygdala and hippocampal complex", *Current Opinion in Neurobiology*, Vol. 14 No. 2, pp. 198-202.

Pillemer, D.B. (2003), "Directive functions of autobiographical memory: the guiding power of the specific episode", *Memory*, Vol. 11 No. 2, pp. 193-202.

Powell, K.S. and Yalcin, S. (2010), "Managerial training effectiveness: a meta-analysis 1952–2002", *Personnel Review*, Vol. 39, pp. 227-241.

Rajah, R., Song, Z. and Arvey, R.D. (2011), "Emotionality and leadership: taking stock of the past decade of research", *The Leadership Quarterly*, Vol. 22 No. 6, pp. 1107-1119.

Reisberg, D. and Heuer, F. (2004), "Remembering emotional events", in Reisberg, D. and Hertel, P. (Eds), *Memory and Emotion*, Oxford University Press, New York, pp. 3-41.

Ryan, L., Hoscheidt, S. and Nadel, L. (2008), "Perspectives on episodic and semantic memory retrieval", in Dere, E., Easton, A., Nadel, L. and Huston, J.P. (Eds), *Handbook of Behavioral Neuroscience Series, Vol. 18, Handbook of Episodic Memory*, Elsevier Sciences, pp. 5-18.

Schacter, D.L. (1987), "Implicit memory: history and current status", *Journal of Experimental Psychology: Learning, Memory, and Cognition*, Vol. 13 No. 3, pp. 501-551.

Schacter, D.L. and Wagner, G.H. (2013), "Learning and memory", in Kandel, E.R., Schwartz, J.H., Jessel, T.M., Siegelbaum, S.A. and Hudspeth, A.J. (Eds), *Principles of Neuroscience*, McGraw Hill, New York, pp. 1441-59.

Sharma, G. (2017), "Pros and cons of different sampling techniques", *International Journal of Applied Research*, Vol. 3 No. 7, pp. 749-752.

Taylor, P.J., Russ-Eft, D.F. and Taylor, H. (2009), "Transfer of management training from alternative perspectives", *Journal of Applied Psychology*, Vol. 94, pp. 104-121.

Tulving, E. (2002), "Episodic memory: from mind to brain", *Annual Review of Psychology*, Vol. 53, pp. 1-25.

Turner, J. and Mavin, S. (2008), "What can we learn from senior leader narratives? The strutting and fretting of becoming a leader", *Leadership and Organization Development Journal*, Vol. 29 No. 4, pp. 376-391.

Ulrich, R.S., Simons, R.F., Losito, B.D., Fioritom, E., Miles, M.A. and Zelson, M. (1991), "Stress recovery during exposure to natural and urban environments", *Journal of Environmental Psychology*, Vol. 11 No. 3, pp. 201-230.

Van Droffelaar, B. and Jacobs, M. (2017), "The role of wilderness experiences in leaders' development toward authentic leadership", *Leadership and Organization Development Journal*, Vol. 38 No. 8, pp. 1144-1156.

Van Droffelaar, B. and Jacobs, M. (2018), "Nature-based training program fosters authentic leadership", *Journal of Leadership Studies*, Vol. 12 No. 3, pp. 7-18.

Walumbwa, F.O., Avolio, B.J., Gardner, W.L., Wernsing, T.S. and Peterson, S.J. (2007), "Authentic leadership: development and validation of a theory-based measure", *Journal of Management*, Vol. 34 No. 1, pp. 89-126.

Zelenski, J.M. and Nisbet, E.K. (2012), "Happiness and feeling connected: the distinct role of nature relatedness", *Environment and Behavior*, Vol. 46 No. 1, pp. 3-23.

About the author

Boy van Droffelaar (1949) obtained his master's degree in Chemical Technology and Business Administration at the University of Twente, the Netherlands. He is a retired Executive who has worked for multinational companies. Now he is an Executive Coach / Facilitator at the Foundation of Natural Leadership (naturalleadersip.eu). In 2020 he obtained his PhD from Wageningen University, the Netherlands. Boy van Droffelaar can be contacted at: b.vandroffelaar@wxs.nl