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EcoWellness: integrating the natural world into wilderness therapy settings with intentionality

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ABSTRACT

Wilderness Therapy (WT) programming has been criticized for underutilizing nature as an active co-facilitator in treatment. Although some concept models in the field take into account nature's contributions in WT, an abundance of multidisciplinary research suggests that nature contact and connection could be of greater emphasis. The purpose of this article is to introduce the EcoWellness model as one empirically based approach for facilitating intentional nature connection in WT. The state of WT research and supporting theory are reported. The EcoWellness framework is over-viewed and embedded within the multidisciplinary literature. A case example is presented and implications for integrating EcoWellness into WT practice, training, and research are discussed.

KEYWORDS

EcoWellness; nature connection; outdoor behavioural healthcare; wellness; wilderness therapy

Nature-based therapies have been utilized internationally since the mid-20th century (Rutko & Gillespie, 2013). Kurt Hahn pioneered the Outward-Bound model in the 1960s and 1970s as a rehabilitation alternative to incarceration for adolescents (Bacon, 1983; Russell, 2001), and the movement has since evolved into a variety of residential programmes with varying titles and degrees of nature-immersion. These wilderness programmes include adventure therapy (Gass, 1993; Gass, Gillis, & Russell, 2012; Gillis & Ringer, 1999; Greenway, 1995; Harper, Peeters, & Carpenter, 2015; Williams, 2000), wilderness therapy (Cronon, 1996; Lutz, Simpson-Housley, & Deman, 1999; Russell, 2001), and outdoor behavioural healthcare (OBH; Roberts, Stroud, Hoag, & Massey, 2017; Russell, 2005). For the purposes of this article, the term 'wilderness therapy' (WT) is used to describe residential therapeutic programmes involving remote wilderness experiences including a licensed clinician who oversees the clinical assessment, treatment planning, and service delivery of such programmes (Hill, 2007). Nature, as a construct, has been defined in numerous ways within and beyond the WT literature. We define it here as a 'spectrum from wilderness to cultural landscapes' (Beringer, 2004, p. 55), inclusive of technological nature (e.g. viewing nature on a screen or listening to nature sounds), urban nature (e.g. a park), and remote nature (e.g. a wilderness setting).

The multidisciplinary research dedicated to exploring the human-nature connection is overwhelmingly clear: nature contact promotes a variety of indicators related to human health and wellness (see Frumkin et al., 2017). Despite immersion in nature, WT programming has been critiqued for using natural settings as a backdrop rather than an intentionally utilized co-facilitator in the treatment process (e.g. Beringer, 2004). Some therapeutic frameworks do take into account nature's potential benefits in WT (e.g. Fernee, Gabrielsen, Andersen, & Mesel, 2017;

Russell & Farnum, 2004), though subsequent research specifically investigating the effects of nature on WT outcomes has been minimal to date. WT programming and evaluation might benefit from a more explicit focus on assessing the effects of nature contact as a means to promote positive client outcomes. In particular, programme short- and long-term effectiveness might be enhanced through fostering intentional and contextualized nature connection in an effort to foster nature connection that extends beyond the WT experience. The purpose of this article is to introduce the EcoWellness framework (Reese & Myers, 2012) as one possible tool for aiding WT programmes in maximizing nature connection as a resource in wilderness environments. The state of WT empirical literature is reported. The EcoWellness model is overviewed and the multidisciplinary wellness literature is embedded within its seven empirically derived factors. A case example is provided and possible strategies for integrating EcoWellness into assessment, treatment and post-treatment are explored. Training and research implications are discussed.

WT research and therapeutic factors

Depending on the population being studied and length of stay, WT programmes have been shown to facilitate positive client outcomes (e.g. Bettmann, 2007; Bettmann, Gillis, Speelman, Parry, & Case, 2016; Cason & Gillis, 1994; Hattie, Marsh, Neill, & Richards, 1997; Roberts et al., 2017; Russell, 2000, 2005; Wilson & Lipsey, 2000). Examples of positive outcomes include the development of a positive therapeutic alliance (Harper, 2009); increased self-evaluation and positive sense of self (Cook, 2008); lasting self-reported positive impact on a client's life (Davis-Berman & Berman, 2012); reduced symptom distress and improved perceptions of social role and interpersonal performance (Roberts et al., 2017); and overall positive outcomes related to client wellness, both during adolescent and young adult stages of development (e.g. Harper, Russell, Cooley, & Cupples, 2007; Russell, 2005).

Length of stay has been shown to impact outcomes. Wilson and Lipsey (2000) found greater effectiveness in WT treatment for those who stayed under 6 weeks when studying a sample of adjudicated youth. In their meta-analysis, which included outcomes of 36 WT studies, Bettmann et al. (2016) noted that some treatment effects are amplified with shorter stays (i.e. behaviour observation) while other outcomes are bolstered with longer stays (i.e. personal effectiveness). Some researchers have found that the therapeutic gains made in WT continue through follow-up intervals up to 18 months (e.g. Roberts et al., 2017) while others have found a decline in some therapeutic gains over time (e.g. Harper et al., 2007; Leichtman & Leichtman, 2001). Harper (2010) argued that the research in WT is replete with unexplained variance and a lack of statistically significant findings with regards to treatment outcomes. Fernee et al. (2017) expanded this assertion by stating that WT has a 'black box problem': although WT has been shown to be effective, empirically derived therapeutic factors contributing to positive outcomes remain largely unknown.

A variety of psychological, social, and spiritual components have been described as influencing WT treatment outcomes (e.g. Baldwin, Persing, & Magnuson, 2004; Bocarro & Richards, 1998; Gass, 1993; Harper, 2010; Rossi, Lipsey, & Freeman, 2004). Key therapeutic elements of WT purportedly include experiential learning, group treks (i.e. travel in the form of hiking), social engagement, overcoming challenges distinctly inherent to group outdoor living, natural consequences, and connection to nature (e.g. Russell, 2006; Russell & Farnum, 2004; Rutko & Gillespie, 2013). Hoyer (2012) argued that a foundation to WT treatment includes nature as a primary driver of change, though relatively few conceptual models explicitly include nature connection in WT. Russell and Farnum (2004) offered a concurrent model of WT treatment that includes nature as one of three therapeutic factors facilitating change in the experience of WT. The model includes Wilderness, the Physical Self, and the Social Self. The authors suggested that 'the wilderness environment, acting alone, can be seen as a restorative environment' (p. 41) and is a significant therapeutic factor throughout the course of treatment. Russell and Gillis (2017) further operationalized this model with the development of the 20-item Adventure Therapy Experience Scale. Through exploratory

and confirmatory factor analysis, the researchers identified four factors, which included Group Adventure, Reflection, Challenge, and Nature. Items assessing the Nature factor include a sense of getting away, attention restoration, valuing time in nature, and appreciating nature's beauty. Moreover, Fernee et al. (2017) proposed an expanded clinical model of Russell and Farnum (2004) framework based on a meta-analysis of research studies that had included descriptions of programme contexts, mechanisms of change, and client outcomes. They retained the Wilderness factor of the model and further expanded its benefits to include opportunities for self-reflection, increased personal awareness and insight, using nature metaphor in treatment, and solo exercises in wilderness. However, relatively little conceptual or empirical guidance presently exists in the WT literature to inform specific nature-based interventions as a means to promote short and long-term treatment outcomes.

EcoWellness: a framework for guiding nature contact in wilderness therapy

An expansive literature base exists outside WT emphasizing the importance of nature contact and connection on human development. Because the research spans so many disciplines (i.e. psychology, public health, environmental psychology, landscape and design, architecture, medicine, environmental education, etc.), it can be difficult to integrate the breadth of studies into clinical practice. The first author, a counsellor educator and researcher, developed the construct of EcoWellness as a means to make useable the human-nature-wellness research in outpatient counselling settings (Reese & Myers, 2012). He defined EcoWellness as one's appreciation, respect for, and awe of nature that contributes to greater connection with one's self and nature and resulting in holistic wellness. The model utilizes the nature-wellness research and associated nature theory as a means to categorize empirical findings into seven empirically derived dimensions. The purpose of the model is to help practitioners and educators identify specific aspects of nature connection that might be bolstered as part of a client's overall treatment plan to promote positive client outcomes. The EcoWellness Inventory (see Reese, Myers, Lewis, & Willse, 2015), a 61-item assessment answered on a Likert scale, operationalized the EcoWellness model and was used to validate the seven underlying factors using confirmatory factor analysis. The framework demonstrated strong internal consistency (Reese et al.) and construct validity through robust associations with a measure of wellness developed in the counselling-based profession (Reese & Lewis, *in press*) called the Indivisible Self Model of Wellness (IS-Wel; Myers & Sweeney, 2008). The seven EcoWellness dimensions are described, including the relevant nature research and associated theory.

Physical and sensory access

Nature contact positively impacts a variety of indicators related to health and wellness (e.g. Frumkin et al., 2017; Van Den Berg et al., 2015). The *Physical Access* factor of EcoWellness is defined as having direct nature proximity in one's life, whether that includes the potential to engage with nearby nature (i.e. at school, at home, or in one's recreational activities) or having access to wilderness settings. For example, some research suggests that the presence of green settings or going on a forest walk can improve focus and concentration (e.g. Berman, Jonides, & Kaplan, 2008). Additional research has demonstrated an association between nature contact and reductions in ADHD symptomology in children (e.g. Faber Taylor & Kuo, 2011). Kaplan and Kaplan (1989) argued that nature restores focus through effortless mental 'soft' fascination following experiences in which a person's mental processes are taxed (e.g. in the case of staring at a computer screen all day). Research in K-12 schools has corroborated this theory, showing that contact with green landscapes in academic settings can contribute to school engagement (e.g. Kuo, Browning, & Penner, 2018; Truong, Gray, & Ward, 2016) as well as academic performance (Camasso & Jagannathan, 2018; Ruiz-Gallardo, Verde, & Valdes, 2013). Additional research suggests that physical access to nature improves cognitive functioning in children (Wells, 2000), increases creativity

(Kochanowski & Carr, 2014), protects against the development of depression (e.g. Bezold et al., 2018), reduces sedentary behaviours in children (e.g. Petraviciene, Grazuleviciene, Andrusaityte, Dedele, & Nieuwenhuijsen, 2018), decreases the risk of cardiovascular disease in adults (Gascon et al., 2016), among improving other physical health outcomes (e.g. Markevych et al., 2014).

Sensory Access includes indirect access to nature through one's senses even if direct contact is not possible. For example, technological nature has been shown to positively impact perceptions of stress recovery (Kahn et al., 2008) and views of nature from one's hospital room have been shown to reduce the length of time needed to recover from surgery (e.g. Ulrich, 1984). One well-tested nature theory supporting these findings includes evolutionary stress reduction theory (Ulrich, 1983). Through exposure to nature, one might experience a pleasant affective response, which is theorized as leading to activation of the parasympathetic nervous system (i.e. activating physiological calming in the body) and deactivation of the sympathetic nervous system (i.e. decreasing the stress response). A variety of studies demonstrate that nature sounds (e.g. Alvarsson, Wiens, & Nilsson, 2010), aromas (e.g. Conrad & Adams, 2012), and virtual reality environments (Annerstedt et al., 2013) including nature can reduce stress and promote relaxation.

Connection

Aside from direct or indirect access to nature, *Connection* may be the most vital factor of EcoWellness. Presumably, the more one feels connected with nature, that is, holds nature as a part of their identity, the more they will seek opportunities to be in or with nature. People connected with nature tend to be happier (Capaldi, Dopko, & Zelenski, 2014; Nisbet, Zelenski, & Murphy, 2011; Zelenski & Nisbet, 2014) and possess greater wellness (e.g. Reese & Lewis, *in press*; Reese, Lewis, Myers, Wahesh, & Iversen, 2014). Some research suggests that exposure to nature during childhood (often combined with the presence of important others) predicts greater connection with nature throughout the lifespan (e.g. Chawla, 2007). Additionally, place attachment theory and its supporting research suggests that people experience greater affiliation with nature spaces over built environments (e.g. Korpela, Ylén, Tyrväinen, & Silvennoinen, 2009). Vital to place attachment includes emotional connection, developing an identity pertaining to place (i.e. the place is described as part of who the person is), viewing the function of place as being relevant to a person's needs or interests, and social bonding, especially with important adults (Ramkissoon, Weiler, & Smith, 2012). Presumably, the more people feel connected with nature, the more they might access natural living systems as a means to promote individual wellness.

Protection

Protection, or nature self-efficacy, includes a sense of confidence or felt sense of effectiveness when engaging nature. This might occur through learning a particular activity (e.g. building a shelter in WT) or through acquiring the knowledge of plants and animals that can aid or impede one's survival. Wilson (1984) introduced the biophilia hypothesis, suggesting that people have a genetically predisposed connection with nature. Literature demonstrating phobias of specific species (e.g. Kendler, Neale, Kessler, Heath, & Eaves, 1992; Ulrich, 1993) as well as cross-cultural preferences for certain natural landscapes (e.g. Falk & Balling, 2010; Lohr & Pearson-Mims, 2006) have been cited in support of biophilia. WT programmes demonstrate positive findings relative to helping participants expand their ability to learn survival skills as well as how to effectively work with others in the social milieu (e.g. Bettmann et al., 2016; White, 2012). Nature-based programming outside wilderness settings (i.e. K-12 environmental education programming) has also been shown to increase self-efficacy in study participants (e.g. Barnett, Vaughn, Strauss, & Cotter, 2011; Margalit & Ben-Ari, 2014).

Preservation

Preservation, or environmental agency, includes the perception of one having the ability to positively impact or care for elements of the natural world. This might include broader global initiatives (e.g. efforts to save a specific endangered species) or local efforts in one's immediate lived context to care for nature or advocate for the environmental needs of their community. Constructs such as nature relatedness (Nisbet, Zelenski, & Murphy, 2009) and connectedness to nature (Mayer & Frantz, 2004) have been positively associated with environmental values and stewardship behaviours which, in turn, have been associated with greater perceptions of wellness. The more people care for nature, the more they tend to report higher indicators of wellness (e.g. Binder & Blankenberg, 2017; Kasser, 2009; Schmitt, Akinin, Axsen, & Shwom, 2018).

Spirituality and community connectedness

Some research suggests that people transcend themselves in the presence of nature and have a greater ability to connect with others and one's sense of spirituality (Schein, 2014). *Spirituality* through an EcoWellness lens includes experiencing positive connection with one's higher power, life-guiding values, or with nature itself. Roszak (1992), a pioneer in the ecopsychology movement, argued that people possess an ecological unconscious. He posited that people have an inherent, spiritual kinship with nature and mental health challenges emerge on account of the growing divide between people and non-human nature in our expanding technological world. While research has not been conducted to empirically investigate the ecological unconscious, research does suggest that nature connection contributes positively to child and adult spirituality (e.g. Harris, 2016; Unruh & Hutchinson, 2011) and the more that people identify as being part of nature, the happier and more well they report being (e.g. Capaldi et al., 2014). *Community Connectedness* is the experience of social cohesion or felt sense of community with others in nature. One quasi-experimental study demonstrated that when in the presence of indoor nature (i.e. a plant), participants were more caring for others than when compared to a lack of indoor nature (Weinstein, Przybylski, & Ryan, 2009). Additional research suggests that nature exposure curbs aggression in youth (e.g. Younan et al., 2016) and increases social cohesion (e.g. Baklien, Ytterhus, & Bongaardt, 2016; Jirasek, Roberson, & Jiraskova, 2017).

EcoWellness summary

The utility of EcoWellness rests in its ability to frame intentional nature connection through one's individual lived context by taking into consideration the empirically based correlates of nature and wellness. Depending on a WT participant's level of EcoWellness, there may be implications for the appropriateness of WT as a treatment modality, how nature is integrated into treatment planning and subsequent treatment, and the ways in which nature contact and connection are infused post-treatment to sustain the therapeutic outcomes achieved in WT. The following case, an integration of clients the second author has treated through her experiences working as a therapist in WT, illustrates how nature contact is applied in many WT contexts.

The case of Jane

Jane is a 15-year-old Caucasian cisgender female coming from an upper middle socioeconomic status (SES) family residing in an urban area of the United States. Prior to enrolment in WT, the programme gathered a history of Jane's presenting concerns (behavioural, emotional and psychosocial), substance abuse history, treatment history, use of social media and electronic games, outdoor use, and current state of being (e.g. drug and alcohol consumption, knowledge of and/or willingness to participate in treatment). In this case, assessment information was gathered from

both Jane and her parents. Prior treatment included one hospital stay lasting four days after a self-harm gesture and ongoing intermittent outpatient therapy over the past year. Jane's primary presenting concerns upon admission are described as depression (self-harm, isolating, decreased interest in activities she once enjoyed), social anxiety, substance use and concerning amounts of time and attachment to social media use specifically regarding transmission of multiple pornographic images of herself via a social media application. Outdoor use via recreation is described as being minimal.

Jane's treatment planning is based on her clinical assessment, including goals that target symptoms of depression and anxiety. The plan integrates interaction with wilderness elements for the purposes of supporting Jane's in developing new skill(s) to work through her presenting symptomatology. Jane's treatment goals include demonstrating an increased ability to cope with the challenges of living in the wilderness; demonstrate consistent care of physical self and personal gear; and be able to meet challenges of primitive fire making, shelter building, food preparation, and daily chores.

Jane's first few days are spent on the initial phase of her programme where she is expected to be off to the side of the main group by approximately 50 ft. She is not supposed to speak with any of the other girls with the exception of an assigned peer mentor and the staff. The intention is to give Jane an opportunity to observe the group without jumping directly into the milieu, to connect with her new outdoor environment, and to work on an initial assignment in which she will write about her life story and share with the group. After Jane shares her life story with the main group, there is a ceremony that her group members and staff organize to symbolize her advancement to the second phase of her programme.

The first few weeks she meets with her therapist and maintains a narrative of not understanding how living outside in primitive conditions can help her, stating that this is 'not the right place for me'. Her therapist provides context for how relating and practicing skills with her peers often models relational interactions she has with her family or friends, thereby offering opportunities for growth. She is encouraged to expand her distress tolerance by learning to focus on what is within her control and what is outside her control. Nature metaphor is integrated by calling attention to possible perceptions of powerlessness (conditions of the wilderness such as weather) and empowerment (learning and using skills to take care of herself) during her time in WT. Around the 3-week mark, Jane has a particularly powerful emotional experience related to the physical challenge of a hike combined with a change in the weather. This experience is a powerful example of how nature metaphor is highlighted throughout the course of treatment in WT.

The group has just finished a three-mile hike to a new campsite. Staff provides the group instructions about taking off their backpacks and making a plan to set up their shelters, stressing the importance of timeliness, as there appears to be a storm coming. One of the staff, Erin, notices that Jane is sitting on top of her pack rather than circling up with the other girls making plans for what needs to get done and how long they think it will take to set up individual and group shelters. The mood is a combination of relief and tense urgency.

Erin walks over to Jane and asks, 'What's up?'

Jane responds with a vacant stare off into the darkening forest, 'Nothing'.

Erin maintains a detached yet compassionate and curious tone, 'Okay. Well, I can't force you to talk to me. What I can do is let you know that we are here to support you, and you can keep sitting here; the likelihood that you will get soaked in the rain grows with each minute that passes'.

'This is stupid!'

'What is stupid?'

'All of this! The fact that we just got done hiking and now we have to do all this stuff to set-up shelters and it's just stupid and not fair!'

'So, is it safe to say that you are physically tired and emotionally frustrated?'

'Oh my goodness! Yes, okay, duh! I'm not good at this stuff, and I shouldn't have to be here!'

Erin sits on the pack beside Jane and stares off into the forest where Jane's eyes have been fixated. The rest of the group continues with staff support to set up shelters. Erin takes a calming audible breath before stating, 'I think it makes sense that you want some time to rest. It was a long hike. I also think that you are a lot stronger than you are letting yourself believe. There have been many times where we have observed you taking on a lot of the workload for your peers and today was no exception. What if you let the group know what you are feeling in a minute after you have had a chance to rest?'

Jane begins to soften her posture, resting her chin onto the back of her partially closed hand that's propped up her knee. She lets the tears she's been holding back well up in her big brown eyes. She moves her gaze closer to the ground near Erin as the tears fall down her dusty cheeks, leaving dirt-tear streaks down her face. 'I hate that we can't just chill right now. I mean why does a storm have to come right now? It's so stupid'.

'Yeah, it's certainly a bummer that the weather is outside of our control. Something that helps me feel better in situations like this is to focus on what is in my control. Like, I can't make the storm come any slower, but I can set up a shelter so that I can stay dry when the rain starts to pour from the sky. Just like at home when your dad comes home in a really bad mood and snaps at you. You can't control his mood but you can choose how you respond'.

Jane sighs an audible sigh of irritation and then it starts to rain. The rain comes fast and heavy. Jane starts to laugh out loud. Erin continues to sit in the rain beside her and smiles. 'What's so funny?' Erin asks.

'I don't know...the rain almost feels good right now. It's crazy how hard it's coming down! It's just funny. Like it couldn't just sprinkle! I mean, come on! It's actually perfect because it's... I don't know!...'

Erin has to yell a bit to be heard over the rain, 'Is it maybe funny because it's like your tears, pent up and bursting out?'

'Ha!', Jane says out loud. 'Yeah, it's like the rain is a parallel to this moment but it's also like...just funny because we are sitting here wishing something would change and now it's raining and we are still sitting here!'

'Well it's up to you. You want to get up and try to go set up a shelter?'

Jane laughs again as the rain continues to soak them. 'Yeah, okay'. Jane stands up and with Erin's prompting gets her rain gear out of her pack and puts it on over her wet clothes. They then make their way to join the group.

This moment epitomizes one of several for Jane throughout her WT process. Personal insights were born from her being exposed to and overcoming the elements of nature. For the remainder of her treatment, Jane begins to 'buy in' and believe in her capacity to grow in the programme. This includes a deeper appreciation for nature, including a new practice of outdoor meditation and identifying a spiritual connection to the wilderness. By the end of treatment, Jane begins developing an internal locus of control, self-confidence, and hope for the future. Near graduation, her therapist works with her to create a relapse prevention plan (detailing triggers of past behaviours and/or substance use and what she identifies as new coping skills and alternatives). The plan loosely incorporates some aspects of her newfound connection to nature such as outdoor meditation exercises and hiking. Some additional preparation for Jane's departure includes the wilderness therapist having a detailed conversation with the therapist that will be taking over the primary care for Jane (whether at home or at another less restrictive out-of-home option like a therapeutic boarding school). Treatment

overview and progress are discussed as well as discharge recommendations. The follow up after Jane discharges WT consists of weekly or monthly check-ins with her new therapist.

Applying EcoWellness in wilderness therapy

Despite Jane's transformative WT experience, she may (understandably) encounter challenges when applying her newly developed wilderness skills at home. Many of the survival skills gained in WT may lack relevance to her city life, as well as the ability to practice them in her immediate environment. Her developed spiritual kinship with wilderness may be remembered, but she may not have direct access to those things she held close to her healing process in the wilderness. Jane's outlook of nature might also be limited to that of remote wilderness, thus impeding her ability to view nearby nature at home as being restorative.

As a way to deepen and sustain Jane's nature connection during and after treatment, EcoWellness assessment and treatment planning might be utilized to further contextualize Jane's connection with nature as a primary change agent in WT. EcoWellness psychoeducation might teach Jane and her family about the possible benefits of nature contact post-treatment and develop ideas for connecting with nature as a family. Additionally, an EcoWellness 're-entry' plan might help Jane continue nature connection in her home environment to reinforce the changes made in WT.

EcoWellness assessment and treatment planning

As part of the assessment process, Jane was asked about her outdoor access at home, but the overall assessment lacked detail to contextualize Jane's prior experience and connection with nature. Assessing the seven dimensions of EcoWellness can help frame nature contact in the treatment planning process and allow Jane's supports in WT to be aware of additional nature triggers and fears. The treatment team might also develop a cultural understanding of what nature connection means within Jane's family and broader community. In the second author's experience, it can be common for individuals entering WT programmes (particularly adolescents) to experience significant stress and anxiety upon intake. Thus, the timing of EcoWellness assessment may depend on the client. For some, EcoWellness assessment might occur at the onset of treatment, for others, after several weeks of habituating to the new environment.

Physical and sensory access

Inviting Jane to consider her contextualized nature access in the home environment may help her identify specific elements of nature for which she might already find affiliation in WT. If none are reported, she could be encouraged to consider one or two aspects of nature she might be interested in learning more about during treatment. Self-advocacy skills could be built during her time in wilderness and then used as a means for increased nature access upon re-entry into her home environment. Additionally, Jane could be introduced to the concept of Sensory Access as a means to improve sleep or improve focus when engaging in school or work. If she initially dismisses the idea, she could be invited to expand her definition of nature throughout treatment to include environments and objects beyond wilderness.

Connection and spirituality

Next, and relatedly, the therapist can identify ways in which Jane feels connection with nature. Jane's therapist can get a sense for key persons or places in her life that help foster connection, or whether nature connection might be strained on account of her relationships with others. Because natural elements are often viewed as something to be overcome in WT, participants might be prone to developing an adversarial connection with nature over the course of treatment, thus potentially missing out on a vitally important restorative resource. Jane seemed to view nature as both something to overcome as well as something to connect with through her sense of

spirituality. As a next step, Jane can be invited to explore how she might sustain this spiritual nature connection beyond treatment by identifying important natural spaces and symbols she might access to further her connection.

Protection, preservation, and community connectedness

Jane might additionally be encouraged in WT to consider how her developing self-efficacy with nature might be applied in the home environment. She could identify hobbies or local outlets that provide her with opportunities to continue engaging her nature skills. Furthermore, Jane could be asked to consider her impact on the natural environment and be encouraged to apply ways of minimizing her environmental impact. During treatment, environmental agency could be emphasized to include the immediate setting (i.e. doing one kind thing for nature each day) as well as developing awareness in the home environment about environmental issues impacting Jane's community. Lastly, the social milieu is conceptualized as a critical aspect of facilitating change in wilderness programmes and WT models (e.g. Russell & Farnum, 2004). A place attachment lens might additionally suggest that the social elements of WT are imperative to nurturing a lasting nature connection. Jane's wilderness experience might be deepened through inviting programme participants during group processing to contemplate their individual and collective EcoWellness, both at home and in the wilderness environment. Jane and her peers could learn from one another various ways to build upon EcoWellness as one avenue for making positive change and examine how Community Connectedness in nature might continue beyond wilderness. Helping Jane build a sense of community in WT and identify important relationships in her home environment (or strategizing ways of building relationships) that can be experienced in nature may be pivotal in maintaining outcomes upon re-entry in the home environment.

EcoWellness psychoeducation

EcoWellness psychoeducation during treatment could educate Jane on the possible ways that nature can benefit her wellness and how she might enhance her experience in the wilderness through this contact. Jane's family could also be introduced to the EcoWellness model and encouraged to think about how the broader family might infuse nature connection in their lives to strengthen family cohesion upon re-entry. Jane's family might also be briefed on her spiritual connection with nature as well as her nature walks or learn additional strategies for nature connection through the programme. Sharing local and national resources through organizations such as Children and Nature Network (2018) might provide families with practical strategies for nature connection.

Creating an EcoWellness 're-entry' plan

There may be some challenges in translating the WT experience post-treatment. The primary author maintains a private practice and often works with youth exiting WT programmes. Rarely does he interface with WT programmes, and clients often report feeling lost with how to continue connection with wilderness in their day-to-day lives following treatment. Jane and her therapist might have developed an EcoWellness transition strategy towards that latter phases of her treatment as part of her relapse prevention plan to help her continue a contextualized nature connection beyond the wilderness experience. For example, Jane may not have the ability to build shelters when returning to her urban environment or have ready access to wilderness, but she might have access to local urban trails or parks to build upon her spiritual connection. Jane might also be invited to consider additional dimensions of EcoWellness she might like to expand at home and identify resources that can help her grow in those specific areas in her continued growth and healing process.

Training and research implications

While Jane's experience in WT was transformative, contextualization of her nature connection may have deepened the effectiveness of nature exposure during WT and assisted her in sustaining nature connection as an essential resource post-treatment. EcoWellness might also serve as a possible training tool with field staff in promoting intentional and culturally-responsive wilderness practices. The construct can additionally expand possibilities to exploring the role of nature connection in WT in programme evaluation and research.

Field staff training

Because field staff often interface with WT programme participants more frequently than clinicians, the EcoWellness framework might be especially useful in field staff training and supervision. Prior to a shift, a wilderness therapist often identifies and shares with field staff the therapeutic directives individual clients may be addressing that week. The therapist could conceptualize and provide suggestions for how field staff might address nature-based directives through application of the EcoWellness model. Following a shift, the therapist can engage field staff in supervision that invites staff members to conceptualize client progress and challenges through the structure of the framework.

Furthermore, Reese (2016) discussed the ethical implications of engaging clients in nature-based counselling work in outpatient settings. One such implication includes the vitalness of maintaining awareness of one's nature worldview. Nature worldview includes the possible ways that a practitioner's personal experience, emotion, opinion (e.g. political), and culture influences intervention selection when integrating nature connection into professional helping. The topic of climate change, for example, can be highly charged and politicized, and programme participants and field staff may carry with them a variety of perspectives. Having a specific sense for the EcoWellness dimensions may offer a schema for staff to integrate interventions that target specific areas of the human-nature connection based in an individual client's treatment plan. Field staff, including therapists and field instructors, might also benefit from self-awareness reflection around their own nature connection and training with the EcoWellness model, as well as ongoing supervision.

Additionally, some research suggests that white, middle-class conceptions of nature include solitude-based experiences (see Byrne, 2012), similar to those experienced in WT. These dominant nature perspectives can (inadvertently) minimize voices of populations on the margins (e.g. ethnic minorities and economically disadvantaged youth), including populations who may value community-based connections with nature (Byrne). Clients from economically impoverished urban areas might have limited access to nature in home environments and either have limited nature exposure or connection (e.g. Boyd, White, Bell, & Burt, 2018). Certainly, the therapeutic milieu is a significant component of WT, and the Community Connectedness domain of EcoWellness may serve as a bridge for clients representing collectivistic orientations. However, cultural bridging may be necessary in order for some clients to benefit fully from the solitude-based wilderness experiences often used in WT (e.g. Fernee et al., 2017).

Future research

The EcoWellness framework invites new avenues for research and programme evaluation in WT. First, empirical work is needed to determine whether EcoWellness can be useful as a training and supervision tool for field staff. Within-subjects designs might be utilized in assessing clinicians and field instructors on factors such as perceived competence in facilitating nature connection pre and post training. Triangulated client ratings might also be collected to determine their level of connection with the staff and the ways in which they view therapy catering to their individual needs pre- and post-trainings. Second, research is needed to determine whether assessing for

client EcoWellness pre-treatment adds above-and-beyond value to WT programmes in the treatment planning process compared to treatment as usual. Causal comparative designs might be utilized to explore client outcomes and clinician ratings pre and post-treatment. Added variables to this research might include client/family EcoWellness psychoeducation training as well as whether the presence or absence of a post-treatment EcoWellness re-entry plan can bolster longitudinal outcomes in WT.

Conclusion

WT has demonstrated effectiveness in addressing the diverse mental health needs of participants, though the modality has demonstrated mixed longitudinal success. The EcoWellness model serves as one possible means to promote empirically based nature connection during and beyond WT to deepen and sustain positive client outcomes. Training field staff to intentionally contextualize client nature connection as part of programme assessment and treatment, as well as inviting staff to consider their own nature worldviews may be possible strategies for integrating EcoWellness into clinical practice. Programme evaluation and research are needed to explore whether applications of EcoWellness can bolster short- and long-term client outcomes in WT.

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Disclosure statement

Ryan Reese is the founder and owner of EcoWellness Counseling and Consulting LLC, a company that integrates the natural environment into counseling and therapy.

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References

- Alvarsson, J. J., Wiens, S., & Nilsson, M. E. (2010). Stress recovery during exposure to nature sound and environmental noise. *International Journal of Environmental Research and Public Health*, 7(3), 1036–1046.
- Annerstedt, M., Jönsson, P., Wallergård, M., Johansson, G., Karlson, B., Grahn, P., ... Währborg, P. (2013). Inducing physiological stress recovery with sounds of nature in a virtual reality forest—Results from a pilot study. *Physiology & Behavior*, 118, 240–250.
- Bacon, S. B. (1983). *The conscious use of metaphor in outward bound*. Denver, Colorado: Colorado Outward Bound School.
- Baklien, B., Ytterhus, B., & Bongaardt, R. (2016). When everyday life becomes a storm on the horizon: Families' experiences of good mental health while hiking in nature. *Anthropology & Medicine*, 23, 42–53.
- Baldwin, C., Persing, J., & Magnuson, D. (2004). The role of theory, research, and evaluation in adventure education. *Journal of Experiential Education*, 26(3), 167–183.

- Barnett, M., Vaughn, M., Strauss, E., & Cotter, L. (2011). Urban environmental education: Leveraging technology and ecology to engage students in studying the environment. *International Research in Geographical and Environmental Education*, 20(3), 199–214.
- Beringer, A. (2004). Toward an ecological paradigm in adventure programming. *Journal of Experiential Education*, 27, 51–66.
- Berman, M. G., Jonides, J., & Kaplan, S. (2008). The cognitive benefits of interacting with nature. *Psychological Science*, 19(12), 1207–1212.
- Bettmann, J. (2007). Changes in adolescent attachment relationships as a response to wilderness treatment. *Journal of the American Psychoanalytic Association*, 55, 259–265.
- Bettmann, J., Gillis, E., Speelman, H., Parry, L., & Case, E. (2016). A meta-analysis of wilderness therapy outcomes for private pay clients. *Journal of Child and Family Studies*, 25(9), 2659–2673.
- Bezold, C. P., Banay, R. F., Coull, B. A., Hart, J. E., James, P., Kubzansky, L. D., ... Laden, F. (2018). The association between natural environments and depressive symptoms in adolescents living in the United States. *Journal of Adolescent Health*, 62(4), 488–495.
- Binder, M., & Blankenberg, A. K. (2017). Green lifestyles and subjective well-being: More about self-image than actual behavior? *Journal of Economic Behavior & Organization*, 137, 304–323.
- Bocarro, J., & Richards, A. (1998). Experiential research at-risk: The challenge of shifting traditional research paradigms. *Journal of Experiential Education*, 21(2), 102–107.
- Boyd, F., White, M. P., Bell, S. L., & Burt, J. (2018). Who doesn't visit natural environments for recreation and why: A population representative analysis of spatial, individual and temporal factors among adults in England. *Landscape and Urban Planning*, 175, 102–113.
- Byrne, J. (2012). When green is white: The cultural politics of race, nature and social exclusion in a Los Angeles urban national park. *Geoforum*, 43, 595–611.
- Camasso, M. J., & Jagannathan, R. (2018). Nurture thru nature: Creating natural science identities in populations of disadvantaged children through community education partnership. *Journal of Environmental Education*, 49, 30–42.
- Capaldi, C., Dopko, R., & Zelenski, J. (2014). The relationship between nature connectedness and happiness: A meta-analysis. *Frontiers in Psychology*, 5, 976.
- Cason, D., & Gillis, H. L. (1994). A meta-analysis of outdoor adventure programming with adolescents. *Journal of Experiential Education*, 17, 40–47.
- Chawla, L. (2007). Childhood experiences associated with care for the natural world: A theoretical framework for empirical results. *Children, Youth and Environments*, 17(4), 144–170.
- Children and Nature Network (2018). *Natural families*. Retrieved from <https://www.childrenandnature.org/initiatives/families/>
- Conrad, P., & Adams, C. (2012). The effects of clinical aromatherapy for anxiety and depression in the high risk postpartum woman—A pilot study. *Complementary Therapies in Clinical Practice*, 18, 164–168.
- Cook, E. (2008). Residential wilderness programs: The role of social support in influencing self-evaluations of male adolescents. *Adolescence*, 43(172), 751–774. Retrieved from proquest.com
- Cronon, W. (1996). The trouble with wilderness; or, getting back to the wrong nature. *Environmental History*, 1, 7–28.
- Davis-Berman, J., & Berman, D. (2012). Reflections on a trip: Two decades later. *Journal of Experiential Education*, 35(3), 326.
- Faber Taylor, A., & Kuo, F. E. M. (2011). Could exposure to everyday green spaces help treat ADHD? Evidence from children's play settings. *Applied Psychology: Health and Well-Being*, 3(3), 281–303.
- Falk, J. H., & Balling, J. D. (2010). Evolutionary influence on human landscape preference. *Environment and Behavior*, 42, 479–493.
- Ferneer, C. R., Gabrielsen, L. E., Andersen, A. J., & Mesel, T. (2017). Unpacking the black box of wilderness therapy: A realist synthesis. *Qualitative Health Research*, 27, 114–129.
- Frumkin, H., Bratman, G. N., Breslow, S. J., Cochran, B., Kahn, P. H., Jr, Lawler, J. J., ... Wood, S. A. (2017). Nature contact and human health: A research agenda. *Environmental Health Perspectives*, 125(7). doi:10.1289/EHP1663
- Gascon, M., Triguero-Mas, M., Martinez, D., Dadvand, P., Rojas-Rueda, D., Plasencia, A., & Nieuwenhuijsen, M. J. (2016). Residential green spaces and mortality: A systematic review. *Environment International*, 86, 60–67.
- Gass, M. A. (1993). *Adventure therapy: Therapeutic applications of adventure programming*. Dubuque, Iowa: Kendall/Hunt.
- Gass, M. A., Gillis, H. L., & Russell, K. C. (2012). *Adventure therapy: Theory, research, and practice*. New York, New York: Routledge.
- Gillis, H. L., & Ringer, T. M. (1999). Adventure as therapy. *Adventure Programming*, 29–37.
- Greenway, R. (1995). The wilderness effect and ecopsychology. In T. Roszak, M. E. Gomes, & A. D. Kanner (Eds.), *Ecopsychology: Restoring the earth, healing the mind*. Berkeley, California: Sierra Club.
- Harper, N. J. (2009). The relationship of therapeutic alliance to outcome in wilderness treatment. *Journal of Adventure Education & Outdoor Learning*, 9, 45–59.
- Harper, N. J. (2010). Future paradigm or false idol: A cautionary tale of evidence-based practice for adventure education and therapy. *Journal of Experiential Education*, 33, 38–55.

- Harper, N. J., Peeters, L., & Carpenter, C. (2015). Adventure therapy. In R. Black & K. S. Bricker (Eds.), *Adventure programming and travel in the 21st century* (pp. 221–236). State College, Pennsylvania: Venture Publishing.
- Harper, N. J., Russell, J., Cooley, K., & Cupples, C. (2007). Catherine freer wilderness therapy expeditions: An exploratory case study of adolescent wilderness therapy, family functioning, and the maintenance of change. *Child and Youth Care Forum*, 36(2), 111–129.
- Harris, K. I. (2016). Let's play at the park! Family pathways promoting spiritual resources to inspire nature, pretend play, storytelling, intergenerational play and celebrations. *International Journal of Children's Spirituality*, 21(2), 90–103.
- Hattie, J., Marsh, H. W., Neill, J. T., & Richards, G. E. (1997). Adventure education and outward bound: Out-of-class experiences that make a lasting difference. *Review of Educational Research*, 67, 43–87.
- Hill, N. R. (2007). Wilderness therapy as a treatment modality for at-risk youth: A primer for mental health counselors. *Journal of Mental Health Counseling*, 29, 338–349.
- Hoyer, S. (2012). Nature's role in adventure therapy. In M. A. Gass, H. L. Lee Gillis, & K. C. Russel (Eds.), *Adventure therapy: Theory, research, and practice* (pp. 95–110). New York, New York: Routledge.
- Jirasek, I., Roberson, D. N., & Jiraskova, M. (2017). The impact of families camping together: Opportunities for personal and social development. *Leisure Sciences*, 39, 79–93.
- Kahn, P. H., Jr., Friedman, B., Gill, B., Hagman, J., Severson, R. L., Freier, N. G., ... Stolyar, A. (2008). A plasma display window?—The shifting baseline problem in a technologically mediated natural world. *Journal of Environmental Psychology*, 28(2), 192–199.
- Kaplan, R., & Kaplan, S. (1989). *The experience of nature: A psychological perspective*. New York, New York: Cambridge University Press.
- Kasser, T. (2009). Psychological need satisfaction, personal well-being, and ecological sustainability. *Ecopsychology*, 1(4), 175–180.
- Kendler, K. S., Neale, M. C., Kessler, R. C., Heath, A. C., & Eaves, L. J. (1992). The genetic epidemiology of phobias in women: The interrelationship of agoraphobia, social phobia, situational phobia, and simple phobia. *Archives of General Psychiatry*, 49, 273–281. Retrieved from <http://archpsyc.jamanetwork.com/journal.aspx>
- Kochanowski, L., & Carr, V. (2014). Nature playscapes as contexts for fostering self-determination. *Children, Youth and Environments*, 24(2), 146–167.
- Korpela, K. M., Ylén, M., Tyrväinen, L., & Silvennoinen, H. (2009). Stability of self-reported favourite places and place attachment over a 10-month period. *Journal of Environmental Psychology*, 29, 95–100.
- Kuo, M., Browning, M. H. E. M., & Penner, M. L. (2018). Do lessons in nature boost subsequent classroom engagement: Refueling students in flight. *Frontiers in Psychology*, 8, 2253.
- Leichtman, M., & Leichtman, M. L. (2001). Facilitating the transition from residential treatment into the community: I. The problem. *Residential Treatment for Children & Youth*, 19, 21–27.
- Lohr, V. I., & Pearson-Mims, C. H. (2006). Responses to scenes with spreading, rounded, and conical tree forms. *Environment and Behavior*, 38, 667–688.
- Lutz, A. R., Simpson-Housley, P., & Deman, A. F. (1999). Wilderness: Rural and urban attitudes and perceptions. *Environment & Behavior*, 31(2), 259–266.
- Margalit, D., & Ben-Ari, A. (2014). The effect of wilderness therapy on adolescents' cognitive autonomy and self-efficacy: Results of a non-randomized trial. *Child Youth Care Forum*, 43(2), 181–194.
- Markevych, I., Thiering, E., Fuertes, E., Sugiri, D., Berdel, D., Koletzko, S., ... Heinrich, J. (2014). A cross-sectional analysis of the effects of residential greenness on blood pressure in 10-year old children: Results from the GINIplus and LISAPlus studies. *BioMed Central Public Health*, 14, 477.
- Mayer, F. S., & Frantz, C. M. (2004). The connectedness to nature scale: A measure of individuals' feeling in community with nature. *Journal of Environmental Psychology*, 24, 503–515.
- Myers, J. E., & Sweeney, T. J. (2008). Wellness counseling: The evidence base for practice. *Journal of Counseling & Development*, 86, 482–493.
- Nisbet, E. K., Zelenski, J. M., & Murphy, S. A. (2009). The nature relatedness scale: Linking individuals' connection with nature to environmental concern and behavior. *Environment and Behavior*, 41(5), 715–740.
- Nisbet, E. K., Zelenski, J. M., & Murphy, S. A. (2011). Happiness is in our nature: Exploring nature relatedness as a contributor to subjective well-being. *Journal of Happiness Studies*, 12(2), 303–322.
- Petraviciene, I., Grazuleviciene, R., Andrusaityte, S., Dedele, A., & Nieuwenhuijsen, M. J. (2018). Impact of the social and natural environment on preschool-age children weight. *International Journal of Environmental Research and Public Health*, 15. doi:10.3390/ijerph15030449
- Ramkissoon, H., Weiler, B., & Smith, L. D. G. (2012). Place attachment and pro-environmental behaviour in national parks: The development of a conceptual framework. *Journal of Sustainable Tourism*, 20(2), 257–276.
- Reese, R. F. (2016). EcoWellness & guiding principles for the ethical integration of nature into counseling. *International Journal for the Advancement of Counselling*, 38, 345–357.
- Reese, R. F., Lewis, T., Myers, J., Wahesh, E., & Iversen, R. (2014). Relationship between nature relatedness and holistic wellness: An exploratory study. *Journal of Humanistic Counseling*, 53, 63–79.
- Reese, R. F., & Lewis, T. F. (in press). Greening counseling: Examining multivariate relationships between ecowellness and holistic wellness. *Journal of Humanistic Counseling*.

- Reese, R. F., & Myers, J. (2012). EcoWellness: The missing factor in holistic wellness models. *Journal of Counseling & Development, 90*(4), 400–406.
- Reese, R. F., Myers, J. E., Lewis, T. F., & Willse, J. T. (2015). Construction and initial validation of the Reese EcoWellness Inventory. *International Journal for the Advancement of Counselling, 37*(2), 124–142.
- Roberts, S. D., Stroud, D., Hoag, M. J., & Massey, K. E. (2017). Outdoor behavioral health care: A longitudinal assessment of young adult outcomes. *Journal of Counseling & Development, 95*, 45–55.
- Rossi, P. H., Lipsey, M. W., & Freeman, H. E. (2004). *Evaluation: A systematic approach* (7th ed.). Thousand Oaks, California: Sage.
- Rozsak, T. (1992). *The voice of the earth: An exploration of ecopsychology*. Grand Rapids, Michigan: Phanes Press, Inc.
- Ruiz-Gallardo, J., Verde, A., & Valdes, A. (2013). Garden-based learning: An experience with “at risk” secondary education students. *The Journal of Environmental Education, 44*(4), 252–270.
- Russell, K. (2000). Exploring how the wilderness therapy process relates to outcomes. *Journal of Experiential Education, 23*(3), 170–176.
- Russell, K., & Gillis, H. L. (2017). The adventure therapy experience scale: The psychometric properties of a scale to measure the unique factors moderating an adventure therapy experience. *Journal of Experiential Education, 40*(2), 135–152.
- Russell, K. C. (2001). What is wilderness therapy? *Journal of Experiential Education, 24*(2), 70–79.
- Russell, K. C. (2005). Two years later: A qualitative assessment of youth well-being and the role of after care in outdoor behavioral healthcare treatment. *Child & Youth Care Forum, 34*(3), 209–239.
- Russell, K. C. (2006). Brat camp, boot camp, or...? Exploring wilderness therapy program theory. *Journal of Adventure Education and Outdoor Learning, 6*, 51–68.
- Russell, K. C., & Farnum, J. (2004). A concurrent model of wilderness therapy process. *Journal of Adventure Education and Outdoor Learning, 4*, 39–55.
- Rutko, E. A., & Gillespie, J. (2013). Where's the wilderness in wilderness therapy? *Journal of Experiential Education, 36*(3), 218–232.
- Schein, D. (2014). Nature's role in children's spiritual development. *Children, Youth and Environments, 24*(2), 78–101.
- Schmitt, M. T., Akin, L. B., Aksen, J., & Shwom, R. L. (2018). Unpacking the relationships between pro-environmental behavior, life satisfaction, and perceived ecological threat. *Ecological Economics, 143*, 130–140.
- Truong, S., Gray, T., & Ward, K. (2016). “Sowing and growing” life skills through garden-based learning to reengage disengaged youth. *LEARNING Landscapes, 10*, 361–385. Retrieved from <http://ojs.learnquebec.ca/index.php/learnland/article/view/738>
- Ulrich, R. S. (1983). Aesthetic and affective response to natural environments. In I. Altman & J. F. Wohlwill (Eds.), *Human behavior and environment* (Vol. 6, pp. 85–125). New York, New York: Plenum Press.
- Ulrich, R. S. (1984). View through a window may influence recovery from surgery. *Science, 224*, 420–421.
- Ulrich, R. S. (1993). Biophilia, biophobia, and natural landscapes. In S. R. Kellert & E. O. Wilson (Eds.), *The biophilia hypothesis* (pp. 73–137). Washington DC: Shearwater Books/Island Press.
- Unruh, A., & Hutchinson, S. (2011). Embedded spirituality: Gardening in daily life and stressful life experiences. *Scandinavian Journal of Caring Sciences, 25*(3), 567–574.
- van den Berg, M., Wendel-Vos, W., van Poppel, M., Kemper, H., van Mechelen, W., & Maas, J. (2015). Health benefits of green spaces in the living environment: A systematic review of epidemiological studies. *Urban Forestry & Urban Greening, 14*(4), 806–816.
- Weinstein, N., Przybylski, A. K., & Ryan, R. M. (2009). Can nature make us more caring? Effects of immersion in nature on intrinsic aspirations and generosity. *Personality and Social Psychology Bulletin, 35*(10), 1315–1329.
- Wells, N. M. (2000). At home with nature: Effects of “greenness” on children's cognitive functioning. *Environment and Behavior, 32*(6), 775–795.
- White, R. (2012). A Sociocultural investigation of the efficacy of outdoor education to improve learner engagement. *Emotional and Behavioural Difficulties, 17*, 13–23.
- Williams, B. (2000). The treatment of adolescent populations: An institutional vs. a wilderness setting. *Journal of Child and Adolescent Group Therapy, 10*, 47–56.
- Wilson, E. O. (1984). *Biophilia*. Cambridge, Massachusetts: Harvard University Press.
- Wilson, S. J., & Lipsey, M. W. (2000). Wilderness challenge programs for delinquent youth: A meta-analysis of outcome evaluations. *Evaluation and Program Planning, 23*, 1–12.
- Younan, D., Tuvblad, C., Li, L., Wu, J., Lurmann, F., Franklin, M., ... Chen, J.-C. (2016). Environmental determinants of aggression in adolescents: Role of urban neighborhood greenspace. *Journal of the American Academy of Child & Adolescent Psychiatry, 55*(7), 591–601.
- Zelenski, J. M., & Nisbet, E. K. (2014). Happiness and feeling connected: The distinct role of nature relatedness. *Environment and Behavior, 46*, 3–23.