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Adventure recreation and subjective well-being: a conceptual framework

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ABSTRACT
Despite the documented positive outcomes of adventure experiences, subjective well-being (SWB) frameworks have been largely absent from discourse and analyses in adventure studies. This conceptual paper proposes a framework for understanding how adventure recreation experiences promote eudaemonic SWB. In our framework, we propose that adventure recreation fosters eudaemonic aspects of SWB by supporting the satisfaction of basic psychological needs for autonomy, competence, relatedness and beneficence. The framework also integrates 'contact with nature' as an important mechanism through which adventure recreation fosters eudaemonic SWB. Analysis of research and practice across diverse aspects of adventure recreation (leisure, tourism, and education contexts) is used to support the proposed framework and to critically evaluate how psychological models, such as self-determination theory (SDT) and SWB, can advance theory and practice in adventure recreation. We conclude by offering a number of suggestions for future research directions and practical implications.

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Self-determination theory; basic psychological needs; eudaimonia; positive psychology; adventure tourism; adventure education

> "*We have discovered* [a]… *black box; we know* [adventure] *works, but we don't know why or how.*" (Ewert, 1983, p. 27)

Outdoor adventure experiences have been shown to facilitate a range of positive affective and cognitive outcomes, such as increased self-confidence, self-esteem, resilience, intrinsic motivation, enjoyment, competence, relatedness, and autonomy, as well as personal transformations, well-being, and the development of eco-centric perspectives (e.g., Brymer & Schweitzer, 2013; Ewert & Yoshino, 2011; Hattie, Marsh, Neill, & Richards, 1997; Scarf et al., 2018; Sheard & Golby, 2006; Sibthorp, Paisley, Gookin, & Furman, 2008; Wang, Liu, & Kahlid, 2006). Adventure recreation has historically been characterised as leisure with uncertainty and defined as physical activities utilising an interaction with the natural environment that contains elements of real or apparent risk (Ewert & Hollenhorst, 1989). Despite the range of benefits attributed to adventure experiences, the 'black box'[1] issue persists in the adventure literature (Shellman, 2011), while subjective well-being (SWB) frameworks and outcomes remain largely absent from discourse and analyses in adventure studies (Durr, 2009; see Houge Mackenzie & Brymer, 2018; Lee & Ewert, 2018 for exceptions).

Subjective well-being models describe well-being in terms of a range of feelings arising from what people do and how they think and feel (Ryan & Huta, 2009). Positive feelings arising from leisure practices such as adventure recreation include happiness, joy, contentment and excitement (i.e., hedonic SWB; Newman, Tay, & Diener, 2014; Ryan & Deci, 2001). Leisure practices can also provide a sense of

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purpose and meaningfulness (e.g., eudaemonic SWB; Ryan & Deci, 2001). In this article, we integrate knowledge about the complexities of SWB as it relates to the leisure practice of adventure recreation.

A large volume of research has established links between (i) leisure and SWB (e.g., Newman et al., 2014) and (ii) contact with nature and general well-being (e.g., Chawla, Keena, Pevec, & Stanley, 2014; Frumpkin et al. 2017; Kaplan, 1995). However, adventure recreation activities have not been examined in great depth using SWB frameworks. Thus, there is a need for theoretical development both in terms of (i) the psychological mechanisms through which adventure experiences can foster SWB, and (ii) how encountering nature in adventure recreation may foster SWB.

Based on these gaps in the adventure recreation literature, we offer a conceptual framework that synthesises recent advances in SWB literature and links these to adventure recreation processes and outcomes. In particular, we advocate for integrating a leading psychological theory of motivation, development, and well-being (self-determination theory: SDT, Ryan & Deci, 2017), to the study of adventure recreation. As self-determination theory explains the core elements of optimal functioning, psychological health, well-being and life satisfaction, we believe that SDT can provide a robust conceptual framework to help explain the adventure recreation 'black box'. Considerable research has shown strong positive relationships between SWB and SDT constructs (e.g., basic psychological need satisfaction; autonomous motivation; autonomy-supportive social environments; see Ryan & Deci, 2001, 2017 for reviews). While SDT constructs relate to both hedonic SWB (e.g., Reis, Sheldon, Gable, Roscoe, & Ryan, 2000) and eudaemonic SWB (e.g., Gagné, Ryan, & Bargmann, 2003), the major focus of this article and our conceptual framework will be on eudaemonic aspects of SWB.

Our integrated conceptual framework will focus specifically on how adventure recreation can foster eudaemonic SWB (e.g., purpose and meaning, life satisfaction) via the satisfaction of the three basic psychological needs for autonomy, competence and relatedness detailed in SDT, as well as the recently proposed fourth basic need for beneficence (Martela & Ryan, 2016; Martela, Ryan, & Steger, 2018). Autonomy is defined as having an authentic sense of self-direction and volition and being the perceived origin of one's own behaviour (Ryan & Deci, 2017). Competence refers to individuals feeling effective in their ongoing interactions with their environment and experiencing opportunities to exercise and express their capacities. Relatedness refers to feeling connected to others, caring about and being cared for by others, and having a sense of belonging both with other individuals and with one's community. Beneficence is characterised by feeling that one has a positive impact on the lives of other people and engaging in prosocial behaviour (Martela et al., 2018). When these basic psychological needs are satisfied, people experience positive psychological development and optimal psychological well-being (Ryan & Deci, 2017).

Our conceptual framework will also identify and differentiate amongst three proposed elements of eudaemonia (i.e., coherence, purpose, significance; Martela & Steger, 2016), that may be supported when adventure recreation experiences satisfy basic psychological needs. Furthermore, we will critique the absence of 'nature' in models of SWB, with a focus on adventure recreation findings that link nature with SWB. Thus, the purpose of this article is to propose a conceptual framework for understanding the process of *how* adventure recreation fosters eudaemonic aspects of SWB by integrating contact with nature alongside the satisfaction of the basic psychological needs for autonomy, competence, relatedness and beneficence.

Review of literature

Setting the scene: What is adventure recreation?

Although the term 'adventure' remains contested in academic literature and popular usage, novelty, uncertainty, physical activity, development of personal skills, pleasurable kinaesthetic awareness of bodily sensations, and voluntary seeking of physical and mental challenges (often framed as 'risk') in natural environments have been cited as key components (e.g., ATTA, 2016; Kerr & Houge Mackenzie, 2012; Swarbrooke, Beard, Leckie, & Pomfret, 2003). Ewert and Hollenhorst (1989, p. 125) defined

adventure recreation as 'a variety of self-initiated activities utilising an interaction with the natural environment, that contain elements of real or apparent danger, in which the outcome, while uncertain, can be influenced by the participant and circumstance.' Building on these parameters, we define adventure recreation as *self-initiated, nature-based physical activities that generate heightened bodily sensations and require skill development to manage unique perceived and objective risks*. In addition to being voluntary and nature-based, this definition distinguishes adventure activities from those encountered in modern urban lifestyles on the basis that they involve *unique* bodily sensations, perceived and objective risks, and skill sets, rather than necessarily involving heightened risks relative to everyday life (e.g., Beedie & Bourne, 2005). While 'extreme' activities, in which mismanaged mistakes will likely result in death (e.g., BASE jumping; Brymer & Schweitzer, 2013), occupy a small proportion of adventure recreation, our definition encompasses a wider scope of adventure pursuits. For instance, trekking/hiking, mountainbiking, and kayaking are increasingly accessible to broader populations at a range of skill levels (see Pomfret, 2006 for a catalogue of contemporary adventure). This approach also includes a broad range of adventure contexts, such as outdoor recreation, outdoor education, adventure tourism, which focus on challenges resulting from interactions with the natural environment.

While traditional perspectives of adventure have emphasised risk-seeking (e.g., Lyng, 2005), our conceptualisation reflects contemporary scholarship that questions the role of risk-seeking in adventure and highlights potentially negative outcomes that can accompany risk-focused models (e.g., Brown, 2009). Scholars have called for academics, practitioners and policymakers to conceptualise adventure in more inclusive ways that benefit a diversity of participants (e.g., Clough, Houge Mackenzie, Mallabon, & Brymer, 2016). Consequently, we argue that focusing on what makes adventure recreation unique and distinct from 'normal modern life', rather than more risky than everyday activities, may be a more productive approach. Accordingly, our framework shifts the emphasis from risk to the importance of unique challenges posed by adventure recreation.

Progress in adventure studies

In traditional risk-focused models of adventure, participants have often been portrayed as selfish adrenaline-seekers or deviant hedonists seeking to conquer nature (e.g., Allman, Mittlestaedt, Martin, & Goldenberg, 2009). In contrast, recent investigations of adventure recreation suggest that eudaemonic participation motives such as goal achievement and social connections, may play a larger role than hedonic motives such as thrill-seeking. Documented eudaemonic outcomes of adventure include: positive life transformations, enhanced quality of life, emotional regulation, development of emotional agency in interpersonal relationships, goal achievement, social connections, and pushing personal boundaries (e.g., Brymer & Schweitzer, 2013; Lee & Ewert, 2018).

In order to develop more robust, integrated models of adventure participation that can inform policy and practice, we need to first identify the key psychological mechanisms that underpin diverse adventure outcomes. While multiple studies have identified the benefits of adventure (e.g., Hattie et al., 1997; Wang et al., 2006), the mechanisms through which these benefits are realised remain contested. In essence, scholars and practitioners know it works, but not necessarily why it works. Researchers have argued that these issues are rooted in theoretical models and practices that are rarely questioned in adventure literature (Brown, 2009).

Over the past decade, some researchers seeking to address this 'black box' issue have integrated mainstream psychological models to inform research and evaluation. For instance, adventure education researchers have employed positive psychology frameworks and measures to assess adventure programmes (e.g., Houge Mackenzie, Son, & Hollenhorst, 2014; Scarf et al., 2018; Sibthorp et al., 2008). Building on this progress in adventure studies, the following sections explore different approaches to examining well-being from both hedonic and eudaemonic perspectives. This exploration is followed by a discussion of how adventure may support eudaemonic SWB through the mechanism of basic psychological need satisfaction.

Progress in well-being research

From the outset, it is important to situate 'well-being' in relation to similar, yet distinct, concepts. Well-being is generally used in reference to individuals, whereas 'quality of life' refers to communities or societies (Gasper, 2010). As Gasper (2010) suggests, well-being is more relevant to discussions of actual experiences and evaluations of specific facets of life, whereas the quality of life may be more relevant holistic evaluations of life or society. While there are overlaps in these approaches, the former (well-being) is rooted in psychological approaches, whereas the latter (quality of life) is more aligned with sociological and social policy approaches. The current discussion of adventure recreation experiences is grounded in psychological approaches to well-being.

Historically, well-being has been operationalised in multiple ways across various disciplines. One dominant approach has emphasised the objective conditions that allow individuals to thrive. This approach, which presumes that human well-being is predicated on increasing conditions such as income, life expectancy, and education (e.g., UN Human Development Index), has played a significant role in shaping public policy at the global level (Dean, 2009). In contrast to this objective approach, economic approaches such as 'preference satisfaction' suggest that well-being is enhanced by enabling people to satisfy their preferences to the greatest degree possible, primarily through increased income (e.g., Benjamin, Heffetz, Kimball, & Szembrot, 2014). This approach is reflected in public policies and measures focused on increasing gross domestic product (GDP) as an indicator of well-being.

In contrast to these approaches, subjective well-being (SWB) perspectives focus to how people feel (over the short and long term) as a result of their actions and situations (e.g., Kahneman, Diener, & Schwarz, 1999). Scholars such as Testoni, Mansfield, and Dolan (2018) have critiqued the shortcomings of objective and preference satisfaction perspectives and argued that SWB approaches, which focus on the consequences of experiences on individuals' mental states, offer distinct advantages. Specifically, they argue that 'of all accounts of well-being, only SWB can encapsulate whether and how much sport (or anything else) really matters to people' (Testoni et al., 2018, p. 818). Although it has been nearly two decades since Diener (2000) suggested using SWB as an index of national well-being, aside from the noteworthy exception to Bhutan, it is only recently that SWB approaches has become more globally embraced. For example, the United Nations now measures SWB across 156 countries and many nations have integrated SWB measures into national statistics (e.g., Fujiwara & Campbell, 2011; Stats NZ, 2018). Given the wider context of these theoretical and policy developments, the current paper focuses specifically on SWB outcomes of adventure recreation experiences.

Subjective well-being: hedonic and eudaimonia perspectives

Within SWB approaches, the complex and symbiotic nature of hedonic and eudaemonic elements has been vigorously debated (e.g., Huta & Waterman, 2014). The primary difference is that hedonia is a more immediate, affective experience, whereas eudaemonia is characterised as 'a good and fulfilling way of life' focused on meaning and purpose (Ryan & Martela, 2016, p. 109). In an effort to address tensions regarding the primacy of hedonic versus eudaemonic approaches to well-being, Ryan and Deci (2001) described well-being as 'a multidimensional phenomenon that includes aspects of both the hedonic and eudaemonic conceptions of well-being' (p.148).

Eudaemonia was the central focus of Ryff's (1989) foundational model of psychological well-being that integrated six psychological dimensions: *autonomy, environmental mastery, personal growth, positive relations with others, purpose in life*, and *self-acceptance*. Ryff and others (e.g., Lü, Wang, Liu, & Zhang, 2014) have since highlighted the role of resilience in eudaemonic approaches to well-being. Resilience, the ability to 'maintain or regain well-being in the face of adversity' (Ryff, 2013, p. 10), can predict important well-being outcomes, such as life satisfaction and affective SWB (Bajaj & Pande, 2016). While the pathways between resilience and well-being remain contested, some research suggests that increases in

resilience, particularly in adventure contexts, can be attributed to an enhanced sense of belonging (Scarf et al., 2017) or the basic psychological need for *relatedness*, as discussed below.

While Ryff's (2013) model focuses on eudaemonic elements, scholars also suggest that hedonia plays an important role in well-being. For example, Denier's tripartite model posits that SWB represents high levels of life satisfaction and positive emotions, and low levels of negative emotions (Diener, Oshi, & Lucas, 2009). Diener et al. define SWB as 'a person's cognitive and affective evaluations of his or her life as a whole' (p. 167). Although definitions and measures of SWB remain contested, there is empirical support for the role of hedonic (e.g., positive and negative affect) and eudaemonic elements (e.g., life satisfaction, meaning) (e.g., Diener et al., 2009; Huta & Waterman, 2014).

Although the purpose of adventure has often been framed in hedonic terms, such as opportunities for positive emotions (e.g., excitement) and peak or flow experiences (Houge Mackenzie, Hodge, & Boyes, 2011), research indicates that eudaemonic aspect of well-being may play a larger role in longer-term SWB and meaningfulness in life. For instance, in a series of three studies Martela et al. (2018) found that positive affect may only directly influence SWB across shorter time frames (e.g., a single day) and that even in these instances, basic psychological needs predicted greater variance in measures of life satisfaction. A recent attempt to model the relationship between leisure and SWB also highlighted the importance of eudaemonic elements. Based on a meta-analysis of 363 studies, Newman et al. (2014) proposed a conceptual model of leisure that influences SWB through the psychological mechanisms of detachment-recovery, autonomy, mastery, meaning, and affiliation (DRAMMA). The authors concluded that enhanced SWB in leisure leads to enhanced global SWB through a bottom-up theory of SWB. Based on this literature, we argue that drawing upon established psychological theories have the potential to improve our understanding of the relationship between adventure and SWB, particularly in terms of how adventure may foster the eudaemonic components of SWB.

Subjective well-being via basic psychological need satisfaction

A leading model of eudaemonia that has the potential to provide an organising framework for adventure experiences is a basic psychological needs theory. This sub-theory of self-determination theory posits that satisfying basic psychological needs is vital for psychological growth (e.g., intrinsic motivation), well-being (e.g., life satisfaction; psychological health), and subjective vitality (Ryan & Deci, 2017). A large volume of evidence demonstrates how satisfying these needs facilitates psychological well-being (see Ryan & Deci, 2017 for a review), and a smaller body of research demonstrates how ill-being results when these needs are thwarted or frustrated (e.g., Vansteenkiste & Ryan, 2013).

Within the basic needs framework, Martela et al. (2018) recently distinguished between those basic psychological needs that support self-expression (autonomy and competence) and those that support self-transcendence (relatedness and beneficence). Autonomy satisfaction results from the experience of volition or free will, in one's behaviour, whereas autonomy is thwarted when an individual feels externally controlled (Ryan & Deci, 2001). Competence satisfaction results from feeling capable of reaching personally determined goals, whereas competence is thwarted by doubts about one's capabilities. Relatedness satisfaction results from feeling deeply connected to important others, whereas relatedness is thwarted by feeling disconnected or excluded from others. Considerable research has demonstrated that satisfying these psychological needs for self-expression and self-transcendence predicts differences in well-being at (a) the level of daily well-being (Reis et al., 2000) and (b) the overall life satisfaction levels (Ryan & Huta, 2009). The influence of basic psychological needs on well-being has been documented across various life domains, such as work (Van Den Broeck, Vansteenkiste, De Witte, Soenens, & Lens, 2010); education (Mouratidis, Vansteenkiste, Sideridis, & Lens, 2011), sport (Stenling & Tafvelin, 2014), and adventure education (Scarf et al., 2018); and across diverse cultural samples (e.g., Chen et al., 2015).

Recently, beneficence has been proposed as a potential fourth basic psychological need that relates to self-transcendence. Based on findings that prosocial behaviours and giving to others

support SWB, Martela and Ryan (2016) assessed whether 'acting benevolently' directly contributed to well-being or whether this effect was mediated by satisfying needs for autonomy, competence or relatedness. In a series of five studies, they found that while the three basic needs explained some of the variances, beneficence satisfaction predicted unique variance in eudaemonic well-being. These findings supported eudaemonic notions that well-being is enhanced by acting in ways that benefit others, even in the absence of direct contact with beneficiaries. As empirical data on the unique contributions of beneficence to well-being is sparse, further research is needed to fully explore this relationship.

Adventure, psychological need satisfaction and eudaemonia

Although the SDT model of basic psychological needs has not been widely used to guide adventure studies (exceptions include Houge Mackenzie et al., 2014; Lloyd & Little, 2010; MacGregor, Woodman, & Hardy, 2014; Scarf et al., 2018; Sibthorp et al., 2008), numerous studies have linked enhanced autonomy, competence, and/or relatedness with adventure recreation activities. Using an SDT framework, MacGregor et al. (2014) found that, compared to a control group, climbers reported significantly higher autonomy, competence and relatedness in daily life and concluded that 'regular climbing provides participants with an agentic emotional experience that then benefits their everyday functioning; such benefits are not derived from other (low-risk) activities' (p.175). Studies from recreation and tourism have supported the role of autonomy in particular in relation to climbing motives and benefits (e.g., Pomfret, 2006). In qualitative studies examining the quality of life and well-being benefits of adventure recreation for women, Lloyd and Little (2005, 2010) argued that well-being can be enhanced by activities that support autonomy, competence and relatedness. Studies by Sibthorp et al. (e.g., 2008) and Wurdinger and Paxton (2003) have repeatedly highlighted the critical importance of autonomy in fostering programme outcomes across a range of participants in therapeutic, educational and recreational adventure contexts.

In addition to autonomy, the importance of competence and relatedness are enduring themes in adventure recreation studies. The perceived challenges in adventure recreation have been shown to have positively influenced optimal experiences and psychological well-being (e.g., Houge Mackenzie et al., 2011; Tsaur, Lin, & Cheng, 2015). Amongst adolescents, extended adventure recreation experiences were shown to support identity development by building competence and supportive relationships (Duerden, Taniguchi, & Widmer, 2012). Adventure education with adolescent girls has also enhanced their social connectedness and self-efficacy in leadership competencies (Richmond, Sibthorp, Gookin, Annarella, & Ferri, 2018). Building competence and relationships with others have been explicitly identified as motives for participating in adventure recreation events (Lynch & Dibben, 2016). In research with over 801 participants across four adventure activities (rock climbing, whitewater kayaking, sea kayaking, canoeing), social motives emerged as the best predictor of group membership (Ewert, Gilbertson, Luo, & Voight, 2013). In summary, the literature demonstrates strong support for the role of autonomy, competence, and relatedness in fostering positive outcomes associated with adventure recreation.

Although we are not aware of any studies investigating the proposed psychological need for beneficence in relation to adventure recreation participation, some research indirectly supports this proposed relationship. Research with youth has identified that adventure recreation can diminish antisocial behaviours and encourage adoption of prosocial behaviours, a key aspect of beneficence (e.g., Walsh & Aubry, 2007). Notwithstanding, much of this research is focused on remedying problematic social behaviours. Given the importance of instructor and/or peer support in developing skills and providing adventure recreation opportunities, we argue that the role of beneficence in fostering well-being for adventure participants is a promising avenue requiring further attention.

Contact with nature and subjective well-being

In addition to the proposed importance of basic psychological need satisfaction in adventure recreation experiences, the 'contact with nature' inherent in adventure recreation may independently contribute to well-being outcomes. While Ryan et al. (2010) have shown that nature increases subjective vitality (hedonic SWB), the role of nature in eudaemonic SWB has not been explicitly explored. Research suggests that humans fundamentally rely on the natural world to maintain well-being and that adventurous leisure can improve participants' connections to nature (Brymer, Cuddihy, & Sharma-Brymer, 2010). Beyond the benefits of adventure resulting from encountering risk and challenge or the social environment, there appear to be additional well-being benefits that may accrue directly from being in natural environments. For example, 'green exercise', exercise performed either in nature or with views of nature, has been shown to increase well-being beyond the benefits reaped by the exercise itself (Pretty, Peacock, Sellens, & Griffin, 2005). Research has documented numerous benefits of both vigorous (e.g., green exercise, outdoor adventure) and less active outdoor leisure (e.g., Frumkin et al., 2017; Mutz & Müller, 2016). Nature appears to play an important role in physical and mental recovery, resilience, and well-being. Access to green space not only reduces stress, increases physical activity, and prevents illness, it can also promote flourishing through increased social capital, family connections, positive emotions, and an improved sense of well-being (e.g., Frumkin et al., 2017; Dolan & Testoni, 2018).

The importance of nature to well-being and flourishing has been attributed to the restoration of attention following exposure to nature (Kaplan, 1995), and some have argued that this relationship may have a biological basis. For instance, brain wave patterns associated with meditative calm have been documented during contact with nature (Aspinall, Mavros, Coyne, & Roe, 2013). Drawing on Frederickson's (2001) 'broaden and build' theory of positive emotions, Aspinall et al. examined cortical correlates of emotional states in green and urban spaces. Consistent with attention restoration theories, these authors found cortical evidence of lower frustration, engagement, arousal, and higher meditation when moving in green spaces. As a result, the authors recommended creating green spaces in urban areas to enhance positive emotional responses and positive mood. Chawla et al. (2014) also examined how nature helps children physically survive and psychologically thrive. Many of the benefits identified by Chawla et al. resonate with SWB and SDT constructs such as relatedness, autonomy, competence, vitality, creativity, and positive emotions. Due to the apparent role that nature plays in human health and flourishing, and the integral role that nature plays in adventure recreation, we argue that understanding how contact with nature may complement basic psychological need satisfaction should receive increased attention in adventure research.

Operationalising eudaemonic SWB: Coherence, purpose, and significance in life

Eudaemonia is often referred to as leading a meaningful life and recent research has robustly demonstrated that meaning in life plays an important role in well-being (see Steger, 2009 for review). However, scholars have increasingly debated the unidimensional nature of research on eudaemonia as meaning and have proposed that meaning has specific, distinctive components. Drawing on theoretical developments in psychological research and philosophy, Martel and Steger (2016) make a convincing case for distinguishing between three core components for meaning in life: coherence, purpose and significance. These three components are used in our conceptual framework to provide an enhanced means of operationalising and testing eudaemonic SWB outcomes. Briefly, coherence is a cognitive assessment of whether one's life makes sense in terms of following predictable patterns and structures. The purpose is motivational as it entails having clear goals, aims and directions in one's life. The significance is evaluative as it entails feeling that one's life has value, worth and importance. These three facets are also proposed to be connected to the overall meaning in life (Martel & Steger, 2016). Although much of the research on eudaemonia has been concerned with what *leads to* a life worth living (antecedents), these

three facets are proposed to encompass the core elements of *experiencing* a meaningful life. Therefore, we have operationalised eudaemonic SWB in these specific terms as they provide a clear means for measuring important SWB outcomes.

A conceptual framework for adventure recreation and eudaemonic SWB

In order to better integrate existing findings and guide future research, we propose a conceptual framework that integrates adventure recreation, SDT basic psychological needs, and eudaemonic SWB (see Figure 1). This integrated conceptual framework characterises eudaemonic SWB as occurring via satisfaction of the four basic psychological needs of autonomy, competence, relatedness and beneficence, and contact with nature. Such SWB development begins with participation in an adventure experience (left side of Figure 1). According to the framework, the adventure recreation experience will only be successful in satisfying the four basic psychological needs if the motivational climate created and nurtured by the leaders and/or peers is need-supportive. A need-supportive motivational climate is created when a participant in an adventure experience is provided with choice and a rationale for tasks, their feelings are acknowledged, opportunities to show initiative and independent work are provided, participants are given non-controlling competence feedback, and the use of guilt-inducing criticism and overt control is avoided by leaders (Mageau & Vallerand, 2003). Peer participants influence the creation of need-supportive motivational climates through similar means. If this need-supportive climate is created, then participants will likely report greater satisfaction of their basic psychological needs; the more these needs are satisfied, the more they become internalised by participants. Finally, the greater the level of need satisfaction and internalisation, the greater the likelihood that participants will report high levels of key psychological well-being markers, such as meaning, purpose, significance and eudaemonic SWB (e.g., Ryan & Deci, 2017) (right side of Figure 1).

Future research directions and implications for theory

The proposed conceptual framework has a range of implications for advancing theory and research. This model supports recent calls to explore how adventure can enhance health and well-being in the

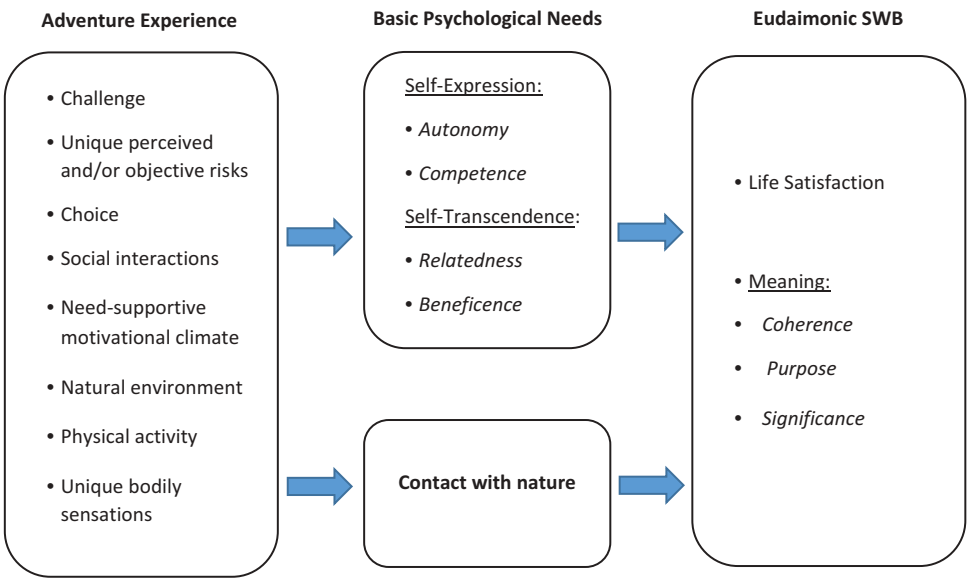

Figure 1. A conceptual framework of how adventure recreation experiences enhance eudaemonic SWB via basic psychological need satisfaction and nature contact.

general population (Clough et al., 2016). Although adventure has not traditionally been viewed as a widely accessible alternative to traditional physical activity (e.g., team sport, exercise), frameworks that explain how adventure supports eudaemonic SWB can foster more health and well-being oriented approaches to adventure recreation. This shift in perspective has implications for public policy (e.g., provision of adventure opportunities for youth and general populations) and for practitioners who design and deliver adventure experiences.

Future research employing longitudinal designs is necessary in order to directly examine the consequences of adventure participation and need satisfaction for SWB development. Longitudinal designs might include studies that experimentally examine the efficacy of SDT-based interventions aimed at promoting need satisfaction and SWB development in adventure contexts. Interventions should be designed with need-supportive leadership strategies to promote need satisfaction, which, in turn, should increase SWB development via adventure recreation. Experimentally examining SDT-based interventions aimed at facilitating SWB development would also allow researchers to determine whether the relationships proposed in this conceptual framework are indeed causal, as well as expanding current understandings of how changes in need satisfaction/frustration predict changes in SWB. Researchers should also examine these relationships at the event or daily levels and more general levels to identify whether or not relationships are influenced by temporal elements. Further, this research should consider whether 'balanced' satisfaction of all four basic psychological needs is important to eudaemonic SWB in adventure contexts (e.g., Sheldon & Hilpert, 2012). Future investigations should evaluate these proposed relationships across a diverse range of adventure experiences (e.g., individual or group; land or water-based; short or extended), and age cohorts (e.g., adolescents, older adults).

Adventure research has often been atheoretical and/or employed descriptive or correlational designs. Seldom have participants or programmes been randomly assigned to conditions, and control or placebo control groups employed, to examine SWB outcomes of adventure experiences. While causal inference research designs can be difficult to conduct, they should not be avoided because of their logistical difficulties (e.g., Shadish, Cook, & Campbell, 2002). To address the need for theoretically driven causal inference adventure research, we offer this conceptual model of adventure recreation, need satisfaction and SWB as a potential guiding framework.

Potential research designs

Researchers can employ a range of research designs beyond randomised control trials to examine causal relationships between adventure, contact with nature, and need satisfaction on SWB. For example, regression discontinuity designs can be used to make causal inferences when random assignment is not practical or ethical (Lesik, 2006), while interrupted time-series designs, within-study comparisons, success case method designs with a time-series element and qualitative impact on analyses offer alternative research design options (Coryn, Schroter, & Hanssen, 2009; Mohr, 1999; Scriven, 2008; Shadish et al., 2002). Researchers could also conduct experimental interventions designed to promote SWB via adventure experiences (e.g., via increasing need-supportive leadership). This research could compare data across multiple informants (e.g., leader, teacher, parent, co-worker, peer ratings of behaviours), direct behavioural observations of SWB outcomes, and participant self-reports. Qualitative and case study research is also needed to examine, in depth, the important role that psychological need satisfaction and nature contact appears to play in facilitating SWB via adventure.

Potential measurement issues

One advantage of incorporating SDT principles into a conceptual framework of adventure (Figure 1), is the ability to accurately measure (a) need-supportive motivational climates; (b) psychological need satisfaction; and (c) SWB. Psychometrically valid and reliable measures of psychological need satisfaction exist for diverse life domains, such as (i) health (Williams, Cox, Kouides, & Deci, 1999), (ii) sport (Ng, Lonsdale, & Hodge, 2011), and (iii) life in general (Kashdan, Julian, Merritt, & Uswatte,

2006). Martela and Ryan (2016) recently developed a four-item measure of beneficence satisfaction that could be used to measure the satisfaction of this need. Psychometrically valid and reliable measures of eudaemonic and hedonic SWB are also abundant (e.g., Satisfaction with Life Scale, Diener, Emmons, Larsen, & Griffin, 1985).

To better explain how social-contextual factors influence need-satisfaction and need-frustration, researchers should consider the extent to which all four basic psychological needs are satisfied/thwarted by behaviours of adventure recreation leaders and peers. There is evidence from the sports domain that unique variance in need satisfaction may be explained by teammate motivational climate (cf. peers) beyond the variance explained by the coach motivational climate (cf. adventure leaders) (Hodge & Gucciardi, 2015). Until recently, SDT researchers have characterised social-contextual factors in terms of: (a) autonomy-support, (b) effectance-support (degree to which competence is supported), and (c) relational-support (Ryan & Deci, 2017). With the recent proposition of a fourth psychological need, future research will also need to assess beneficence and beneficence-support. To assess social-contextual factors, future research could employ the Interpersonal Behaviours Questionnaire (IBQ; Rocchi, Pelletier, Cheung, Baxter, & Beaudry, 2017), which assesses need-support and need-thwarting for autonomy, competence and relatedness; however, an additional measure of beneficence-support/thwarting would need to be developed.

Implications for practice

We also offer our conceptual framework as a basis for theoretically informed best practice guidelines to support SWB across a range of adventure contexts. With respect to creating a need-supportive motivational climate, there are numerous practical examples of leadership strategies from educational psychology (e.g., Cheon, Reeve, & Ntoumanis, 2018) and coaching literature (e.g., Mageau & Vallerand, 2003). Domains that may benefit from purposefully designed adventure experiences that support basic psychological needs and enhance SWB include: (i) public schools and school policy; (ii) urban and community programme planning; (iii) public health policy; and (iv) adventure tourism.

Public schools and school policy

As schools have been identified as 'the a priori institutions that can serve as the vehicles for [optimal human] development' (Linley, Joseph, Harrington, & Wood, 2006, p. 10), public education settings may be ideal venues for integrating curricula that use adventure recreation to enhance SWB. Identifying opportunities to integrate adventure in schools, and other public well-being services, may open creative new avenues for translating principles of SWB into social action. Including outdoor adventure in social policy and public school curriculum would increase accessibility to these programmes and provide increased widespread well-being benefits (e.g., Mutz & Müller, 2016).

Urban and community programme planning

Using psychological models to understand adventure has the potential to facilitate a more diverse range of well-being promotion options for individuals and communities. Recognising expanded opportunities for interventions may help shape public policy, urban planning, and community environments. Potential initiatives include developing natural spaces in urban areas that are conducive to self-directed adventure activities for a range of skill levels and creating 'community adventure' programs (cf. Molix & Nichols, 2013) that foster basic need satisfaction through adventure opportunities. In order to effectively promote well-being across communities through the adventure, initiatives should be widely accessible for community members of all ages and demographics and structured around key eudaemonic pillars of well-being. For example, exploratory research supports the value of adventure for elderly adults across a range of well-being domains (e.g., physical, social, cognitive; Boyes, 2009). Applying SDT principles to adventure

initiatives for the wider public may provide a novel avenue for enhancing community well-being across a range of life stages.

Public health policy

Measures of SWB are increasingly being used at national and global levels to develop policies and evaluate social outcomes. Diener (2000) argued that SWB should be of interest to policymakers not only because of its 'inherent value', but also because individual SWB provides broader social benefits. Well-being is increasingly used as an important measure of thriving alongside economic outputs, as epitomised by Bhutan's Gross National Happiness survey used to assess national well-being. Global recognition of SWB indicators provides adventures researchers with a means to articulate the practical applications of their research for broader audiences in relation to public health and well-being.

Adventure tourism

Our conceptual framework has a number of practical implications for adventure tourism guides and operators. This model can help operators purposefully design adventure experiences to meet increasing tourist demands for eudaemonic experiences that provide a sense of well-being and meaning alongside hedonic demands for fun and excitement (e.g., Swarbrooke et al., 2003). The integrated SDT and SWB framework provides direct implications for designing adventure experiences, which may also translate into competitive points of difference and novel marketing strategies. For example, expanding beyond risk or thrill to focus on supporting basic needs and motivational climates may have direct implications for itineraries (e.g., activities, locations) and guides-client interactions. This framework also has important implications for guide training and development programmes in relation to leadership and communication skills. Refocusing the aims of adventure tours to include basic psychological need satisfaction and SWB outcomes has the potential to enhance the quality and safety of tours, expand opportunities for developing new adventure experiences, and offer novel means of assessing client experiences and satisfaction.

Conclusion

Reframing adventure in terms of satisfying psychological needs and SWB outcomes allows us to re-examine the role that adventure can play in enhancing eudaemonic well-being for individuals and communities. Developing shared models, concepts and language that links adventure to key indicators of well-being, such as meaning, autonomy, competence, or relatedness, may also promote greater acceptance of these activities as mainstream, health-promoting leisure pursuits. Using this framework may also improve the quality of individual and group adventure experiences across recreation, education and tourism contexts by providing specific well-being principles that can be translated into practice (see practical recommendations above). This shift may increase the public's perceived value of adventure recreation in quality of life; provide public health, education, and recreation practitioners with a broader range of strategies to enhance well-being; support adventure researchers seeking to advance beyond the constraints of a 'niche' field; and encourage policymakers and funding bodies to broaden their notions of life-enhancing leisure.

Despite shared values and objectives that include understanding hedonic and eudaemonic well-being, psychologists and adventure researchers have remained largely isolated from one another. Integrating these disparate yet complementary areas of research would yield great benefits. This conceptual exploration has synthesised and integrated diverse areas of existing knowledge from psychology and adventure studies to illustrate promising new directions in research and practice. These integrations have the potential to transform our understanding of how adventure can promote optimal functioning for individuals and communities.

Note

1. The 'black box' issue, identified over 30 years ago (Ewert, 1983; Shellman, 2011), refers to critiques that positive outcomes are frequently reported in studies of adventure recreation and education, but these are seldom accompanied by robust theoretical explanations of how or why these outcomes occurred. Thus, scholars have frequently called for improved theoretical models of what happens during adventure experiences (i.e., in the 'black box') to foster positive outcomes.

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No potential conflict of interest was reported by the authors.

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