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To cite this article: Hideo Matsumoto, Shintaro Sato, Akira Asada & Koichi Chiashi (2018): Exploring the relationship among leisure engagement, affective and cognitive leisure involvement, and subjective happiness: a mediating role of leisure satisfaction, World Leisure Journal, DOI: [10.1080/16078055.2018.1444669](https://doi.org/10.1080/16078055.2018.1444669)

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# Exploring the relationship among leisure engagement, affective and cognitive leisure involvement, and subjective happiness: a mediating role of leisure satisfaction

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## ABSTRACT

The current study was conducted to examine the relationship among leisure engagement, affective (i.e. attraction, centrality, resistance to change) and cognitive (i.e. equipment, knowledge) leisure involvement, leisure satisfaction, and subjective happiness. From a sample of 493 American scuba divers, we found that (1) the oft-supported leisure engagement-happiness relationship was rejected, and (2) subjective happiness was directly or indirectly associated with affective and cognitive leisure involvement factors. Specifically, leisure engagement did not show any significant relationship with subjective happiness. Rather, subjective happiness was associated with several affective and cognitive leisure involvement factors. Attraction was associated with subjective happiness through leisure satisfaction, while the relationship between subjective happiness and centrality was negative. Equipment was positively and indirectly associated with subjective happiness whereas knowledge was directly linked to subjective happiness. These demonstrated that affective and cognitive involvement rather than leisure engagement are strongly associated with subjective happiness. Detailed theoretical interpretation and useful information for policy makers who develop leisure programmes aimed at enhancing public happiness will be provided.

## ARTICLE HISTORY

Received 9 November 2016  
Accepted 6 September 2017

## KEYWORDS

Scuba diving; subjective happiness; outdoor sport; well-being; quality of life

## Introduction

People commonly set goals aimed at improving their subjective happiness (Frey & Stutzer, 2010). Although society is more economically prosperous than ever before due to the widespread growth of economy (Saunders, 2001), our search for happiness has not arrived at the conclusion. In a wide variety of contexts, numerous scholars have explored the factors that might influence subjective happiness (Gu, Huang, Zhang, & Wang, 2015; Hsee, Hastie, & Chen, 2008; Su, Pan, & Chen, 2014), which is defined as people's subjective evaluation of how happy their overall lives are (Lyubomirsky & Lepper, 1999). For example, Seligman (2011) suggested that positive emotion, positive relationships,

engagement, accomplishment, and meaning in life are all associated with well-being whereas Gu et al. (2015) found that undesirable environmental circumstance (i.e. air pollution) could negatively influence subjective happiness. Hsee et al. (2008) emphasized that both maximizing positive factors and minimizing negative factors are essential tasks to improve happiness. Hence, understanding various antecedents of happiness will contribute to, in a broader sense, our society.

Leisure engagement has been considered a vital predictor of subjective happiness (Kuykendall, Tay, & Ng, 2015; Newman, Tay, & Diener, 2014; Sato, Yoshida, Wakayoshi, & Shonk, 2017). Prior empirical findings also showed a positive relationship between subjective happiness and engaging in physically active leisure (e.g. running and outdoor recreation; Lee, Shin, Bunds, Kim, & Cho, 2014; Sato, Jordan, & Funk, 2014; Walker, Halpenny, Spiers, & Deng, 2011), and even sedentary activities like sports spectatorship and surfing the Internet (Koopman-Boyden & Reid, 2009; Wang, Min, & Kim, 2013). Leisure engagement is a behavioural concept, often operationalized as the frequency and the amount of time individuals participate in leisure activities outside obligated work time (Kuykendall et al., 2015). However, this behaviour-oriented concept may not sufficiently explain subjective happiness. Some individuals, for instance, think that participating in a leisure activity (i.e. leisure engagement), such as hiking, is enjoyable while others consider it as a usual exercise. Do these two groups of individuals perceive the same level of subjective happiness derived from leisure engagement? This example can demonstrate that the effect of leisure engagement on subjective happiness cannot be fully described without incorporating the psychological factors associated with a focal leisure activity.

In the field of leisure and recreation, it is believed that individuals are progressively involved in a leisure activity based on various factors such as attraction, centrality, resistance to change, knowledge, and equipment (Donnelly, Vaske, & Graefe, 1986; Kerins, Scott, & Shafer, 2007; Needham & Vaske, 2013; Oh, Lyu, & Hammitt, 2012). Understanding the relationship between leisure engagement and subjective happiness requires the incorporation of the aforementioned affective (i.e. attraction, centrality, and resistance to change) and cognitive (i.e. knowledge and equipment) aspects pertaining to leisure activities. Using scuba diving as its focal leisure activity, this study aims to extend the oft-supported relationship between leisure engagement and subjective happiness (Kuykendall et al., 2015; Newman et al., 2014). Specifically, we investigated how affective and cognitive leisure involvement, leisure engagement, and subjective happiness are associated. We also will examine whether leisure satisfaction can mediate the relationships between aforementioned leisure factors and subjective happiness.

## **Theoretical background and literature review**

### ***Leisure involvement, leisure engagement, and subjective happiness***

Previous literature has demonstrated a positive association between leisure engagement and subjective happiness (Kuykendall et al., 2015; Sato et al., 2014; Shin & You, 2013). For example, Sato et al. (2014) found that participating in a physically active leisure (i.e. running) can improve individuals' subjective happiness. Shin and You's (2013) research yielded similar findings showing how active leisure engagement can enhance

subjective happiness. Although past research provided useful insight into the relationship between leisure engagement and subjective happiness, few studies have focused on how other leisure-related psychological factors contribute to subjective happiness.

Leisure engagement is defined as the amount of time and frequency individuals participate in leisure activities (Kuykendall et al., 2015). To date, although no consensus definition of the concept of leisure engagement has been established, prior studies have regularly treated it as a behavioural variable (Kuykendall et al., 2015; Walker et al., 2011). Nevertheless, when its relationship with subjective happiness is the concern, this behaviour-oriented conceptualization has limitations. For example, individuals who regularly participate in scuba diving activities may not psychologically perceive that the activity is central to their lives. On the other hand, those who participate in scuba diving significantly less may perceive that the activity is very important for their lives. Therefore, it is important to incorporate the leisure engagement concept with other psychological factors to advance the understanding of subjective happiness.

In the field of leisure and recreation research, scholars have multi-dimensionally described how individuals are involved in a focal leisure activity. Individuals progressively strengthen not only behavioural (i.e. leisure engagement) but also psychological associations with a focal leisure activity (Kerins et al., 2007; Needham & Vaske, 2013). Previous literature presented a number of psychological factors such as attraction, centrality, resistance to change, knowledge, and equipment (Iwasaki & Havitz, 2004; McIntyre & Pigram, 1992; Oh et al., 2012; Schroeder, Fulton, Lawrence, & Cordts, 2013).

These factors are usually divided into two parts: affect and cognition. Affective factors are closely related to the importance of a focal leisure activity to lifestyle (Jun, Kyle, Graefe, & Manning, 2015; McIntyre & Pigram, 1992). Attraction, one of the important affective factors, refers to pleasure and enjoyment associated with leisure activities and plays a fundamental role in leisure lifestyle (Jun et al., 2015; Kyle, Graefe, Manning, & Bacon, 2003). Centrality is defined as the extent to which the leisure activity plays a central role in one's life (Jun et al., 2015; McIntyre & Pigram, 1992). Resistance to change refers to the extent to which individuals are not willing to change their leisure activity preferences (Iwasaki & Havitz, 2004). In other words, it describes whether individuals are psychologically attached to a focal leisure activity. Scholars often use self-expression or sign as one of the affective involvement factors (Kyle et al., 2003; Sato et al., 2017). However, we utilized resistance to change to measure affective leisure involvement in this study. A generic idea of leisure involvement depicts how ones are involved in and continuously participate in a focal leisure activity (Wiley & Shaw, 2000). The application of resistance to change is deemed appropriate as it can also describe the degree to which individuals feel importance of and continuously participate in scuba diving. In our research model, these factors are treated as affective leisure involvement and describe how important a focal leisure activity is to one's life.

In addition to affective leisure involvement, cognitive leisure involvement can also contribute to the understanding of subjective happiness. In this study, cognitive leisure involvement is defined as the extent to which an individual recognizes how they are equipped with necessary abilities and skills pertaining to focal activities. It is important to examine the relationship between leisure engagement and subjective happiness by adding cognitive leisure involvement. For example, ones can express their attachment (i.e. affect) to focal activities, but they do not necessarily possess relevant abilities and skills. Understanding

the relationship is, therefore, limited without incorporating cognitive aspects of leisure involvement. Recall that individuals progressively develop associations with a focal leisure activity (Bryan, 1979). It is believed that individuals are cognizant of the progressive improvement regarding knowledge and equipment through the course of leisure experiences (Bryan, 1979; Kerins et al., 2007; McFarlane, 2004). In other words, this cognitive leisure involvement is explained by the acquisition and improvement of knowledge and equipment (Bryan, 1979; Donnelly et al., 1986; Needham & Vaske, 2013). Previous literature often includes knowledge and equipment as factors of cognitive leisure involvement, which can reflect how individuals are involved in focal activities (Kerins et al., 2007; McFarlane, 2004).

In the current study, we argue that the aforementioned affective and cognitive leisure involvement can uniquely contribute to subjective happiness in addition to the traditionally investigated behavioural-oriental leisure engagement. It will contribute to the extant literature regarding the relationship between leisure engagement and subjective happiness by further delineating the effects elicited from various aspects of leisure engagement.

### ***Leisure satisfaction as a bridge between leisure engagement and subjective happiness***

As mentioned, research on the relationship between leisure and subjective happiness has been extensive and has found a consistent, positive association (Sato et al., 2014; Shin & You, 2013). Based on the empirical findings, it can be hypothesized that leisure engagement as well as each leisure involvement factor can individually contribute to the increase of subjective happiness. In turn, the question is, do individuals really become happier as they become more engaged and involved in leisure activities? We argue that there can be an intervening variable that connects the link between leisure-related factors and subjective happiness.

We argue that even if individuals become more involved in a focal leisure activity, it may not directly cause subjective happiness. Newman et al. (2014) proposed a conceptual model that explains how individuals' leisure engagement leads to their subjective happiness based on various theoretical perspectives such as the bottom-up approach (Diener & Ryan, 2009) and self-determination theory (Ryan & Deci, 2000). The bottom-up theory explains that happiness is determined by their satisfaction of subordinate domains such as work, health, and leisure (Diener, 1994). Indeed, the satisfaction of leisure domain can contribute to overall subjective happiness (Liang, Yamashita, & Brown, 2013; Newman et al., 2014; Uysal, Sirgy, Woo, & Kim, 2016). Empirical research has also supported the argument. People appear to feel happy when they are satisfied with their leisure activities (Spiers & Walker, 2008). Shin and You (2013) also found that active leisure such as participating sports leads to leisure satisfaction, which can, in turn, positively influence subjective happiness. Other literature has also demonstrated that leisure satisfaction is a strong predictor of subjective happiness (Ateca-Amestoy, Serrano-del-Rosal, & Vera-Toscano, 2008; Theodorakis, Kaplanidou, & Karabaxoglou, 2015; Uysal et al., 2016).

Self-determination theory also provides useful insights regarding potential factors that are associated with leisure satisfaction and subjective happiness. Ryan and Deci (2000) argue that intrinsically motivated individuals naturally regulate their motivations to do

focal activities. The autonomic motivations typically lead to enjoyment. Enjoyment often operationalized as attraction is an essential element in affective leisure involvement (Jun et al., 2015; Kyle et al., 2003). Indeed, obtaining enjoyable experience is positively associated with leisure satisfaction, which in turn influences subjective happiness (Kuykendall et al., 2015). Centrality is also an important factor in leisure (Jun et al., 2015; McIntyre & Pigram, 1992). It is defined as the extent to which individuals assign relative importance on focal activities based on the comparisons to other life interests (Selin & Howard, 1988). Since the concept can be captured based on relative evaluations, ones need to receive subsequent psychological benefit Leisure activities can be exceptionally central to one's life through the course of leisure participation. In fact, Lee et al. (2014) found that the more individuals felt centrality regarding their leisure activities, the more satisfied they became. Newman et al. (2014) mentioned that leisure creates something important to ones' lives, which they referred to meaning in their study. Centrality can be strongly linked with meaning, and it does influence ones' satisfaction and subjective-happiness. Lastly, regarding resistance to change, individuals are less likely to switch their leisure activities when they develop strong affective attachment to the activity (Iwasaki & Havitz, 2004). Although Iwasaki and Havitz (2004) suggested that resistance to change can be an outcome of leisure involvement, the current study treated the concept as a measure of affective involvement.

Studies have reported that individuals tend to evaluate target objects (i.e. scuba diving) consistent with their existing attitude (Petty, Wegener, & Fabrigar, 1997), and this tendency can be even stronger when they have strong psychological attachment to it (Eagly & Chaiken, 1993). Therefore, individuals are likely to be satisfied with their leisure activities when they are psychologically attached to the activities. Together, the following hypotheses are developed:

H1: Attraction will be positively associated with subjective happiness through leisure satisfaction.

H2: Centrality will be positively associated with subjective happiness through leisure satisfaction.

H3: Resistance to change will be positively associated with subjective happiness through leisure satisfaction.

Answering this question will provide us important information to understand subjective happiness because leisure satisfaction is the strong predictor of subjective happiness. In general, leisure involvement influences satisfaction with a pertinent leisure experience (Lee et al., 2014; Uysal et al., 2016).

Several factors have been considered cognitive aspects of leisure involvement, such as knowledge and equipment based on the traditional view of leisure research (McFarlane, 2004; Needham & Vaske, 2013); they can also be positively associated with leisure satisfaction. The contention is supported as knowledge, while equipment can be related to the sense of mastery and competence. People feel more satisfied with their leisure activities when they are motivated and perceived like an expert in their activity (Chen, Li, & Chen, 2013; Heintzman & Mannell, 2003; Thomas & Butts, 1997). As mentioned, individuals are aware of the improvement of their knowledge and equipment regarding leisure activities, which are important factors in their cognitive

systems (Bryan, 1979; Kerins et al., 2007; McFarlane, 2004). New skills and techniques in sports and leisure activities are obtained because of the improvement of technology and equipment (Rintala, 1995). In other words, better equipment provides individuals with the sense of mastery and competence (Bloch, Black, & Lichtenstein, 1989). Stebbins (1992) emphasized that the sense of mastery is important in individuals' leisure experience. Obtaining pertinent knowledge also serves an essential element to become a specialized/expert individual in a focal leisure activity (Getz & McConnell, 2011; Thapa, Graefe, & Meyer, 2006; Tsaur & Liang, 2008). It could be reasoned that people are more likely to be satisfied with their leisure activities if they possess equipment and knowledge associated with their leisure activities. We argue that along with the aforementioned affective and cognitive involvement, actual leisure experiences are also positively associated with leisure satisfaction (Kuykendall et al., 2015; Spiers & Walker, 2008; Walker et al., 2011; Zhong & Mitchell, 2010). Incorporating the empirical findings and arguments, the following hypotheses are additionally proposed. The hypothesized model for this study is also depicted in Figure 1.

H4: Equipment will be positively associated with subjective happiness through leisure satisfaction.

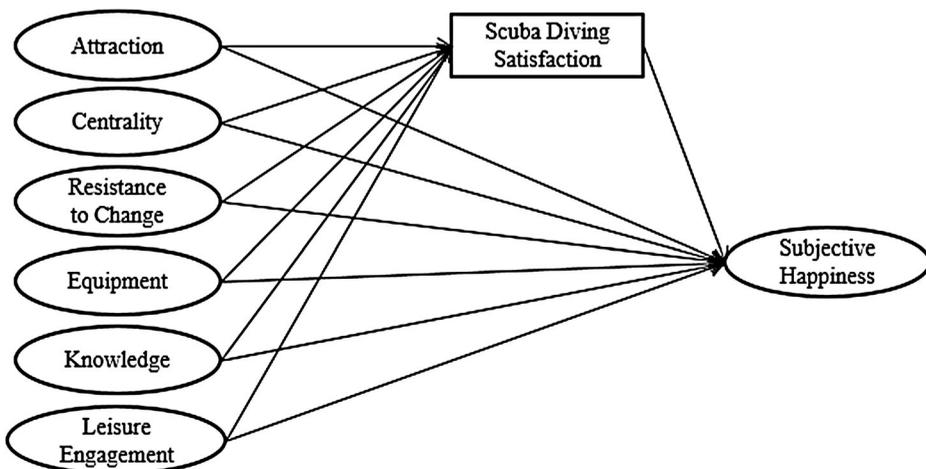
H5: Knowledge will be positively associated with subjective happiness through leisure satisfaction.

H6: Leisure engagement will be positively associated with subjective happiness through leisure satisfaction.

## Methods

### *Participants and procedure*

We gathered data from 564 American scuba diving participants via Amazon Mechanical Turk (Mturk). We focused on scuba diving as a focal activity to minimize the influences of external factors. Specifically, all scuba divers must be certified by completing universally



**Figure 1.** Hypothesized model.

standardized programmes that managed by World Recreational Scuba Council. The level of certificates can vary from introductory to instructorial certificates. It could be reasoned that scuba divers have objective evaluation criteria to cognitively assess their own specialization levels in terms of knowledge and equipment.

Mturk is an online marketplace where researchers can recruit potential participants for surveys. We used Mturk because it has been recognized as an efficient and reliable method for data collection (Buhrmester, Kwang, & Gosling, 2011; Mason & Suri, 2012). In addition, Mturk has been shown its usefulness in recent leisure research (e.g. Wong, Newton, & Newton, 2014). In particular, Omodior, Pennington-Gray, Holland, Thapa, and Kiouisis (2017) used Mturk to recruit survey participants who participated in outdoor activities including scuba diving. Because of such background, we concluded that it was appropriate to use this online platform for our data collection.

Each participant received a small monetary incentive (US \$0.60) for their participation. The recruitment advertisement clearly indicated that survey participants were required to have scuba diving experience and that expertise in scuba was not necessary. Participants also answered a screening question in the survey to authenticate their fulfilment of this inclusion criterion. After deleting cases that contained missing values and outliers, the final dataset included 493 useful responses (useful response rate of 87.4%). A majority of participants (63.7%) were male and the average age was 30.42 years old ( $SD = 8.76$ ). Most of the participants were Caucasian (79.1%), followed by Asian (7.3%), Hispanic (4.7%), and African-American (5.9%).

### **Measures and data analysis procedure**

Affective leisure involvement was measured by the following three factors: attraction, centrality, and resistance to change, whereas cognitive leisure involvement was captured by knowledge and equipment. Finally, leisure engagement was operationalized as participants' actual scuba diving experience. A total of 17 items were adopted from previous literature (Kerins et al., 2007; McIntyre & Pigram, 1992; Schroeder et al., 2013). Two open-ended items about diving experience requested participants to report their total lifetime number of diving experiences and their recent number of diving experiences within past 12 months. The rest of items were measured on a 7-point Likert-type scale ranging from 1 = *strongly disagree* to 7 = *strongly agree*. Adopted from previous literature, leisure satisfaction was measured by a single item. In various research realms, satisfaction has commonly been measured with a single-item global measure (Petrick, 2004; Walsh & Mitchell, 2010). Studies have shown that single-item scales are as useful as multiple-item scale in capturing attitudinal constructs (Jordan & Turner, 2008; Trail & James, 2001). Therefore, the use of the global measure deemed appropriate. The item asked how participants to rate their scuba diving satisfaction on a 7-point Likert-type scale ranging from 1 = *very dissatisfied* to 7 = *very satisfied*. Finally, subjective happiness was measured by the subjective happiness scale developed by Lyubomirsky and Lepper (1999). Two items in the scale were measured with a 7-point semantic differential scale, ranging from 1 = *less happy* to 7 = *more happy*. The other two items were measured with a 7-point Likert-type scale ranging from 1 = *not at all* to 7 = *great deal*. Table 1 summarizes further details of the measurement items (e.g. the number of items used to reflect each construct).

**Table 1.** Descriptive statistics, standardized factor loading, construct reliability, and Cronbach's alpha coefficient for the measurement model ( $N = 493$ ).

	<i>M</i>	<i>SD</i>	$\lambda$	CR	$\alpha$
<b>Attraction</b>				.72	.73
Scuba diving is one of the most enjoyable things to do.	5.82	.86	.68		
Scuba diving is interesting to me.	6.30	.74	.56		
Scuba diving is important to me.	5.63	.99	.79		
<b>Centrality</b>				.88	.74
I find a lot of my life organized around scuba diving.	4.40	1.43	.87		
Scuba diving plays a central role in my life.	4.43	1.42	.92		
I enjoy discussing scuba diving with others (e.g. friends, family, co-workers).	5.89	.91	.73		
<b>Knowledge</b>				.86	.83
I am knowledgeable about scuba diving.	5.63	.95	.89		
I know much about scuba diving.	5.55	.98	.94		
I know better about scuba diving compared to people around me.	5.58	1.10	.59		
<b>Equipment</b>				.84	.83
I have acquired equipment that I can only use for scuba diving.	5.82	1.15	.73		
Compared to other divers, I own good scuba diving equipment.	5.03	1.37	.88		
I renew my scuba diving equipment regularly.	4.97	1.42	.77		
<b>Resistance to Change</b>				.82	.81
I have a preference for scuba diving over other leisure.	5.52	1.04	.78		
Even if my close friends recommend other recreational activities, I prefer scuba diving.	5.14	1.27	.84		
I sometimes think about scuba diving even when I am in other leisure activities.	5.15	1.27	.70		
<b>Leisure Engagement</b>				.82	.26
How many dives have you done in your entire life?	59.95	123.27	.79		
How many times did you go scuba diving in last 12 months?	7.74	13.57	.87		
<b>Scuba Diving Satisfaction</b>				N/A	N/A
How would you rate your scuba diving satisfaction?	6.04	.78	N/A		
<b>Subjective Happiness</b>				.88	.84
In general, I consider myself (less happy – more happy)	5.51	1.16	.91		
Compared to most of my peers, I consider myself (less happy – more happy)	5.14	1.30	.86		
Some people are generally very happy. They enjoy life regardless of what is going on, getting the most out of everything. To what extent, does this characterization describe you?	5.13	1.33	.88		
Some people are generally not very happy. Although they are not depressed, they never seem as happy as they might be. To what extent, does this characterization describe you?	4.91	1.76	.52		

Note: *M* = mean; *SD* = standard deviation;  $\lambda$  = standardized factor loadings; CR = construct reliability coefficient;  $\alpha$  = the Cronbach's alpha coefficient.

Data analysis followed the two-step approach established by Anderson and Gerbing (1988) and included a confirmatory factor analysis (CFA) to validate the measurement model. After confirming the measurement model, a structural equation model (SEM) was performed to assess the hypothesized model. Finally, the mediating effects of scuba diving satisfaction on the relationship between leisure involvement/engagement factors and subjective happiness were further assessed by employing path analysis with the bias-corrected bootstrap.

## Results

### Testing of measurement model

A confirmatory factor analysis (CFA) was performed using AMOS 20.0 to establish the measurement scale's validity and reliability. For this analysis, we developed a measurement model which specified eight latent factors to be correlated with each other. Based on modification indices, four within-construct error covariance terms were also added. Specifically, covariance terms were drawn between the error terms of (1) first and

second items measuring attraction, (2) second and third items measuring attraction, (3) first and third items measuring centrality, and (4) second and their items measuring centrality. The overall fit of the measurement model was assessed using  $\chi^2/df$  ratio, root mean square error of approximation (RMSEA), comparative fit index (CFI), and standardized root mean square residual (SRMR).

The model fit indices showed an acceptable model fit ( $\chi^2/df = 2.38$ , RMSEA = .05, CFI = .96, SRMR = .05; Hair, Black, Babin, & Anderson, 2009). In addition, every measurement scale item's loading was statistically significant and greater than .50. Construct reliability (CR) value ranged from .72 to .88 thereby establishing convergent validity (Hair et al., 2009). The Cronbach's alpha coefficients of six factors were greater than .70, suggesting acceptable level of reliability (Hair et al., 2009). Although the Cronbach's alpha coefficient of diving experience was found to be low ( $\alpha = .26$ ), it is because one item focuses on the total lifetime number of diving experiences whereas the other item measures the recent number of diving experiences, and hence, two items have quite different variance. Thus, this low alpha does not necessarily suggest that the two items are inconsistent. In fact, these two items showed fairly high correlation ( $r = .69$ ) and CR value (.82).

To determine discriminant validity, correlations among measured variables were analyzed (see Table 2). Correlations between variables ranged from .15 to .67. In addition, every squared correlation was smaller than the average variance extracted (AVE) value thereby establishing discriminant validity (Hair et al., 2009; Kline, 2011).

### Testing of structural model

We developed a structural model by specifying the paths among factors. Specifically, we drew directional arrows from attraction, centrality, resistance to change, knowledge, equipment, and leisure engagement to scuba diving satisfaction and subjective happiness. A path from scuba diving satisfaction to subjective happiness was also specified. The model fit indices used in CFA were also used to assess the structural model.

The structural model showed a good fit with the data ( $\chi^2/df = 2.38$ , RMSEA = .05, CFI = .96, SRMR = .05). With regard to the direct effects on scuba diving satisfaction, attraction ( $\gamma = .59$ ,  $p < .01$ ), centrality ( $\gamma = -.14$ ,  $p < .05$ ), and equipment ( $\gamma = .14$ ,  $p < .05$ ) emerged as significant factors. The results also revealed the direct effects of knowledge ( $\gamma = .16$ ,  $p < .05$ ) and scuba diving satisfaction ( $\beta = .20$ ,  $p < .01$ ; see Table 3) on subjective happiness. Since scuba diving satisfaction was significantly associated with subjective

**Table 2.** Correlation matrix of the research variables.

	1	2	3	4	5	6	7	8
1. Attraction	.47	.40	.45	.26	.45	.08	.36	.11
2. Centrality	.63	.71	.22	.27	.34	.05	.11	.08
3. Resistance to Change	.67	.58	.60	.62	.25	.07	.19	.07
4. Equipment	.51	.52	.55	.63	.38	.11	.15	.07
5. Knowledge	.67	.47	.50	.30	.67	.11	.18	.11
6. Leisure Engagement	.28	.23	.33	.34	.26	.69	.05	.02
7. Scuba Diving Satisfaction	.60	.33	.43	.39	.43	.22	1.00	.11
8. Subjective Happiness	.33	.28	.33	.27	.26	.15	.33	.66

Note: The diagonal shows the AVE value of each construct. Correlations are under the diagonal, and squared correlations are above the diagonal.

**Table 3.** Direct effects on scuba diving satisfaction and subjective happiness.

Path		Standardized path coefficient
Attraction	→ SDS	.59*** (.11)
Centrality	→ SDS	-.14** (.07)
Knowledge	→ SDS	-.01 (.08)
Equipment	→ SDS	.14** (.08)
Resistance to Change	→ SDS	.02 (.08)
Leisure Engagement	→ SDS	.04 (.04)
Attraction	→ SH	.03 (.12)
Centrality	→ SH	.11 (.06)
Knowledge	→ SH	.16** (.09)
Equipment	→ SH	.04 (.09)
Resistance to Change	→ SH	-.02 (.10)
Leisure Engagement	→ SH	.01 (.04)
SDS	→ SH	.20*** (.06)

Note: Bootstrap standard errors appear in parentheses; SDS = Scuba diving satisfaction; SH = Subjective happiness; \* $p < .05$ ; \*\*\* $p < .01$ .

happiness, the aforementioned factors (i.e. attraction, centrality, and equipment) could also be associated with subjective happiness via scuba diving satisfaction as predicted.

To examine such mediating roles of scuba diving satisfaction, the significance of the indirect effects was examined by employing the bootstrap method. MacKinnon, Lockwood, and Williams (2004) compared the accuracy of several bootstrap methods and suggested that the bias-corrected approach is the best way to test indirect paths in mediation analysis. In addition, it is generally recommended to generate 1000 or more bootstrap samples to form accurate confidence intervals (Bollen & Stine, 1990; Efron, 1987). Thus, we employed the bias-corrected bootstrap and generated 1000 bootstrap samples. As summarized in Table 4, the bias-corrected confidence intervals of attraction, centrality, and equipment do not include zero. This result indicated that the relationships between (a) attraction and subjective happiness, (b) centrality and subjective happiness, and (c) equipment and subjective happiness were mediated by scuba diving satisfaction. Specifically, standardized indirect effects of attraction, centrality, and equipment on subjective happiness were .12,  $-.03$ , and .03, respectively.

## Discussion and implication

Happiness is a common goal for most people. Research shows that participating in leisure/physical activities can contribute to the achievement of this goal (Kuykendall et al., 2015; Newman et al., 2014; Sato et al., 2014; Shin & You, 2013). The purpose of this study was to further extend the extant knowledge regarding the relationship between leisure and happiness by incorporating leisure involvement, leisure engagement, leisure satisfaction, and subjective happiness. Specifically, we examined whether subjective happiness is associated with leisure engagement and leisure involvement factors through leisure satisfaction.

The results of SEM revealed that subjective happiness was associated with several involvement factors such as attraction, centrality, and equipment through leisure satisfaction. With regard to attraction, the findings indicated that individuals tend to feel happy when they enjoy their leisure activities. However, this relationship is supported only when the relationship is mediated by leisure satisfaction, supporting H1. Somewhat mixed findings have been reported in the previous literature. For example, the sense of

**Table 4.** Indirect effects and their respective confidence intervals.

Path			Standardized indirect effect	Bias-corrected 95% CI
Attraction	→ SDS	→ SH	.12*	.04, .23
Centrality	→ SDS	→ SH	-.03*	-.07, -.01
Knowledge	→ SDS	→ SH	-.01	-.04, .03
Equipment	→ SDS	→ SH	.03*	.002, .08
Resistance to Change	→ SDS	→ SH	.01	-.03, .04
Leisure Engagement	→ SDS	→ SH	.01	-.01, .03

Note: SDS = Scuba Diving Satisfaction; SH = Subjective Happiness.

\*Significant indirect effect (i.e. confidence interval does not include zero).

enjoyment (i.e. attraction) is related to intrinsic motivation (Ryan & Deci, 2000) and an important aspect of leisure (Jun et al., 2015). It could, therefore, directly influence human happiness (Bosnjak, Brown, Lee, Yu, & Sirgy, 2016). However, attraction was not directly associated with subjective happiness. We argue that this finding is consistent with the bottom-up theory (Diener & Ryan, 2009). Based on the theory, leisure satisfaction is viewed as a domain of life satisfaction. It should be more logical that leisure-related factors are indirectly associated with subjective happiness through leisure satisfaction rather than the direct association.

With respect to centrality, it was negatively associated with subjective happiness through leisure satisfaction, which rejected H2. This inconsistent result emerged due to the negative relationship between centrality and leisure satisfaction. We argue that the expectation-confirmation paradigm (Oliver, 1980) might provide an alternative explanation. The more a focal leisure activity becomes central to one's life, the harder it is for individuals to be satisfied with the leisure activity as their expectation toward the leisure activity could be high. This alternative explanation could be convincing although we need to keep it as a speculative view. It can also corroborate with the non-significant relationship between resistance to change and leisure satisfaction. Individuals' unwillingness to change their leisure activity preference is a strong affective quality (Iwasaki & Havitz, 2004). It can lead to leisure satisfaction as individuals tend to stick with their attitude-consistent evaluations (Petty et al., 1997). However, as the non-significant relationship between resistance to change and leisure satisfaction implies, individuals may not develop satisfaction based on their existing beliefs in scuba diving settings. Future research should be conducted to further understand the relationship between affective leisure involvement and leisure satisfaction by incorporating unique characteristics of various leisure activities. Overall, when affective leisure involvement is the focus, scuba divers must be satisfied with scuba diving by acquiring enjoyment in order to improve subjective happiness.

The findings also indicated that equipment was significantly associated with subjective happiness through leisure satisfaction, supporting H4. Specifically, to enhance subjective happiness, equipment specialization must satisfy individuals' scuba diving experience. This result provides additional insight into the relationship between leisure and subjective happiness. We argue that having decent equipment for scuba diving can be associated with mastery, which is an important predictor of leisure satisfaction (Chen et al., 2013; Newman et al., 2014). However, it is also important to note that obtaining equipment may be correlated with the income level. As the level of income is an important variable to examine subjective happiness (Diener & Biswas-Diener, 2002; Diener & Oishi, 2000),

future research should be conducted to further understand the effect of equipment aspect on subjective happiness.

Another aspect of cognitive involvement- knowledge- was also associated with subjective happiness. However, inconsistent with our prediction, it demonstrated the direct relationship rather than indirect one through leisure satisfaction. We did not necessarily expect knowledge to be directly associated with subjective happiness, but the findings can be in line with the bottom-up theory (Diener & Ryan, 2009) and self-determination theory (Ryan & Deci, 2000). Equipment could be an important element for a leisure domain satisfaction, acquiring knowledge can be associated with an ultimate value of our lives rather than a specific domain. Subjective happiness is enhanced when people feel autonomy and competent about themselves in various domains such as work and leisure (Fiorillo, 2011; Reis, Sheldon, Gable, Roscoe, & Ryan, 2000). In the field of leisure, Stebbins (1992) also highlighted the importance of mastery in individual leisure experience. A notable difference between equipment and knowledge can be whether they are internal or external. Equipment can be an external factor that individuals utilize temporarily while knowledge can be permanent in mind. It could be reasoned that knowledge is more strongly associated with the sense of autonomy and competence as each individual develops on their own rather than temporal equipment utilizations. This could be a reason why knowledge about scuba diving was directly associated with subjective happiness regardless of the domain satisfaction.

Finally, the current study demonstrated that there is not a relationship between leisure engagement and leisure satisfaction. It is inconsistent with prior studies (Kuykendall et al., 2015; Newman et al., 2014). Although the cross-sectional research method can raise concerns regarding the causality, the current study shed light on the importance of affective and cognitive leisure involvement, rather than behaviour-oriented leisure engagement, where improving subjective happiness is the concern. Overall, the current study contributes to the advancement of understanding of subjective happiness in scuba diving settings. The findings also provide useful information to policy makers who develop leisure programmes aimed at enhancing quality of life. Policy makers need to know that not only does the actual experience of a leisure activity influence subjective happiness, but so does knowledge acquisition about the activity as well. More importantly, enjoyment derived by participating in scuba diving is deemed the most important catalyst that can improve their subjective happiness. One way or another, incorporating more leisure activities into public programming can provide opportunities for individuals to enjoy their leisure and appears likely to be an effective approach to enhancing public subjective happiness.

### **Limitation and future research directions**

There are several limitations that should be noted. First, the generalizability of the current study should be exercised with caution. Although collecting data from Mturk has been increasingly common in the field of psychology, the sample may not represent the characteristics of general scuba diver population. Second, one item scale was used to measure leisure satisfaction in this study. Although the usefulness of single-item measurement has been recognized, it could be better to use several items to assess internal consistency of leisure satisfaction. Moreover, in relation to the research method, we employed a cross-

sectional online survey to examine the focal relationships. However, the design does not provide convincing arguments regarding the causal relationships among variables. Scholars need to implement better data collection methods in the future studies. For example, (1) procuring data from different points of time and (2) combining primary and secondary data to infer causalities could be viable options. Third, previous research discussed alternative affective and cognitive leisure factors such as self-expression and skill levels (Bricker & Kerste, 2000; Kerins et al., 2007) absent in this study. Therefore, future research should consider how subjective happiness can also be associated with these factors. In addition, if scuba diving is categorized as a physically active leisure activity, its positive association with subjective happiness can be consistent with previous work (Sato et al., 2014; Shin & You, 2013). However, other outdoor leisure activities have also been categorized as appreciative (e.g. jogging), consumptive (e.g. fishing), and motorized (e.g. jet skiing; Dunlap & Heffernan, 1975). Assessing how these different outdoor leisure types can potentially impact subjective happiness will further extend understanding of the relationship between leisure and subjective happiness. In conclusion, the current study shed light on the importance of affective and cognitive factors associated with leisure activities to help us further understand subjective happiness. Further examinations regarding leisure domain satisfaction will further benefit the knowledge accumulation regarding human happiness.

## Disclosure statement

No potential conflict of interest was reported by the authors.

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## References

- Anderson, J. C., & Gerbing, D. W. (1988). Structural equation modeling in practice: A review and recommended two-step approach. *Psychological Bulletin*, 103, 411–423.
- Ateca-Amestoy, V., Serrano-del-Rosal, R., & Vera-Toscano, E. (2008). The leisure experience. *The Journal of Socio-Economics*, 37, 64–78.
- Bloch, P. H., Black, W. C., & Lichtenstein, D. (1989). Involvement with the equipment component of sport: Links to recreational commitment. *Leisure Sciences*, 11, 187–200.
- Bollen, K. A., & Stine, R. (1990). Direct and indirect effects: Classical and bootstrap estimates of variability. *Sociological Methodology*, 20, 115–140.
- Bosnjak, M., Brown, C. A., Lee, D. J., Yu, G. B., & Sirgy, M. J. (2016). Self-expressiveness in sport tourism determinants and consequences. *Journal of Travel Research*, 55, 125–134.
- Bricker, K. S., & Kerste, D. L. (2000). Level of specialization and place attachment: An exploratory study of whitewater recreationists. *Leisure Sciences*, 22, 233–257.
- Bryan, H. (1979). *Conflict in the great outdoors: Toward understanding and managing for diverse sportsmen preferences*. Tuscaloosa, AL: Bureau of Public Administration, University of Alabama.
- Buhrmester, M., Kwang, T., & Gosling, S. D. (2011). Amazon's mechanical Turk: A new source of inexpensive, yet high-quality, data? *Perspectives on Psychological Science*, 6, 3–5.
- Chen, Y. C., Li, R. H., & Chen, S. H. (2013). Relationships among adolescents' leisure motivation, leisure involvement, and leisure satisfaction: A structural equation model. *Social Indicators Research*, 110, 1187–1199.

- Diener, E. (1994). Assessing subjective well-being: Progress and opportunities. *Social Indicators Research*, 31, 103–157.
- Diener, E., & Biswas-Diener, R. (2002). Will money increase subjective well-being? *Social Indicators Research*, 57, 119–169.
- Diener, E., & Oishi, S. (2000). Money and happiness: Income and subjective well-being across nations. In E. Diener, & E.M Suh (Eds.), *Culture and Subjective Well-Being* (pp. 185–218). Cambridge, MA,US: The MIT Press.
- Diener, E., & Ryan, K. (2009). Subjective well-being: A general overview. *South African Journal of Psychology*, 39, 391–406.
- Donnelly, M. P., Vaske, J. J., & Graefe, A. (1986). Degree and range of recreation specialization: Toward a typology of boating related activities. *Journal of Leisure Research*, 18, 81–95.
- Dunlap, R. E., & Heffernan, R. B. (1975). Outdoor recreation and environmental concern: An empirical examination. *Rural Sociology*, 40, 18–30.
- Eagly, A. H., & Chaiken, S. (1993). *The psychology of attitudes*. Fort Worth, TX: Harcourt Brace Jovanovich College Publishers.
- Efron, B. (1987). Better bootstrap confidence intervals. *Journal of the American Statistical Association*, 82, 171–185.
- Fiorillo, D. (2011). Volunteer work and domain satisfactions: Evidence from Italy. *International Journal of Social Economics*, 39, 97–124.
- Frey, B. S., & Stutzer, A. (2010). *Happiness and economics: How the economy and institutions affect human well-being*. Princeton, NJ: Princeton University Press.
- Getz, D., & McConnell, A. (2011). Serious sport tourism and event travel careers. *Journal of Sport Management*, 25, 326–338.
- Gu, D., Huang, N., Zhang, M., & Wang, F. (2015). Under the dome: Air pollution, wellbeing, and pro-environmental behaviour among Beijing residents. *Journal of Pacific Rim Psychology*, 9, 65–77.
- Hair, J. F., Black, W. C., Babin, B., & Anderson, R. E. (2009). *Multivariate data analyses* (7th ed.). New York, NY: Prentice Hall.
- Heintzman, P., & Mannell, R. C. (2003). Spiritual functions of leisure and spiritual well-being: Coping with time pressure. *Leisure Sciences*, 25, 207–230.
- Hsee, C. K., Hastie, R., & Chen, J. (2008). Hedonomics: Bridging decision research with happiness research. *Perspectives on Psychological Science*, 3, 224–243.
- Iwasaki, Y., & Havitz, M. E. (2004). Examining relationships between leisure involvement, psychological commitment and loyalty to a recreation agency. *Journal of Leisure Research*, 36, 45–72.
- Jordan, J. S., & Turner, B. A. (2008). The feasibility of single-item measures for organizational justice. *Measurement in Physical Education and Exercise Science*, 12, 237–257.
- Jun, J., Kyle, G., Graefe, A., & Manning, R. (2015). An identity-based conceptualization of recreation specialization. *Journal of Leisure Research*, 47, 425–443.
- Kerins, A. J., Scott, D., & Shafer, C. S. (2007). Evaluating the efficacy of a self-classification measure of recreation specialization in the context of ultimate frisbee. *Journal of Park and Recreation Administration*, 25, 1–22.
- Kline, R. B. (2011). *Principles and practice of structural equation modeling* (3rd ed.). New York, NY: The Guilford Press.
- Koopman-Boyden, P. G., & Reid, S. L. (2009). Internet/e-mail usage and well-being among 65–84 year olds in New Zealand: Policy implications. *Educational Gerontology*, 35, 990–1007.
- Kuykendall, L., Tay, L., & Ng, V. (2015). Leisure engagement and subjective well-being: A meta-analysis. *Psychological Bulletin*, 141, 364–403.
- Kyle, G., Graefe, A., Manning, R., & Bacon, J. (2003). An examination of the relationship between leisure activity involvement and place attachment among hikers along the Appalachian trail. *Journal of Leisure Research*, 35, 249–273.
- Lee, H. W., Shin, S., Bunds, K. S., Kim, M., & Cho, K. M. (2014). Rediscovering the positive psychology of sport participation: Happiness in a ski resort context. *Applied Research in Quality of Life*, 9, 575–590.

- Liang, J., Yamashita, T., & Brown, J. S. (2013). Leisure satisfaction and quality of life in China, Japan, and South Korea: A comparative study using AsiaBarometer 2006. *Journal of Happiness Studies, 14*, 753–769.
- Lyubomirsky, S., & Lepper, H. S. (1999). A measure of subjective happiness: Preliminary reliability and construct validation. *Social Indicators Research, 46*, 137–155.
- MacKinnon, D. P., Lockwood, C. M., & Williams, J. (2004). Confidence limits for the indirect effect: Distribution of the product and resampling methods. *Multivariate Behavioral Research, 39*, 99–128.
- Mason, W., & Suri, S. (2012). Conducting behavioral research on Amazon's mechanical Turk. *Behavior Research Methods, 44*, 1–23.
- McFarlane, B. L. (2004). Recreation specialization and site choice among vehicle-based campers. *Leisure Sciences, 26*, 309–322.
- McIntyre, N., & Pigram, J. J. (1992). Recreation specialization reexamined: The case of vehicle-based campers. *Leisure Sciences, 14*, 3–15.
- Needham, M. D., & Vaske, J. J. (2013). Activity substitutability and degree of specialization among deer and elk hunters in multiple states. *Leisure Sciences, 35*, 235–255.
- Newman, D. B., Tay, L., & Diener, E. (2014). Leisure and subjective well-being: A model of psychological mechanisms as mediating factors. *Journal of Happiness Studies, 15*, 555–578.
- Oh, C. O., Lyu, S. O., & Hammitt, W. E. (2012). Predictive linkages between recreation specialization and place attachment. *Journal of Leisure Research, 44*, 70–87.
- Oliver, R. L. (1980). A cognitive model of the antecedents and consequences of satisfaction decisions. *Journal of Marketing Research, 17*, 460–469.
- Omodior, O., Pennington-Gray, L., Holland, S., Thapa, B., & Kiousis, S. (2017). Chikungunya disease awareness among US travelers to Caribbean destinations. *International Journal of Travel Medicine and Global Health, 5*, 20–27.
- Petrick, J. F. (2004). The roles of quality, value, and satisfaction in predicting cruise passengers' behavioral intentions. *Journal of Travel Research, 42*, 397–407.
- Petty, R. E., Wegener, D. T., & Fabrigar, L. R. (1997). Attitudes and attitude change. *Annual Review of Psychology, 48*, 609–647.
- Reis, H. T., Sheldon, K. M., Gable, S. L., Roscoe, J., & Ryan, R. M. (2000). Daily well-being: The role of autonomy, competence, and relatedness. *Personality and Social Psychology Bulletin, 26*, 419–435.
- Rintala, J. (1995). Sport and technology: Human questions in a world of machines. *Journal of Sport and Social Issues, 19*, 62–75.
- Ryan, R. M., & Deci, E. L. (2000). Self-determination theory and the facilitation of intrinsic motivation, social development, and well-being. *American Psychologist, 55*, 68–78.
- Sato, M., Jordan, J. S., & Funk, D. C. (2014). The role of physically active leisure for enhancing quality of life. *Leisure Sciences, 36*, 293–313.
- Sato, M., Yoshida, M., Wakayoshi, D.J., & Shonk. (2017). Event satisfaction, leisure involvement and life satisfaction at a walking event: the mediating role of life domain satisfaction. *Leisure Studies, 36*, 605–617.
- Saunders, S. (2001). Fromm's marketing character and rokeach values. *Social Behavior and Personality: An International Journal, 29*, 191–195.
- Schroeder, S. A., Fulton, D. C., Lawrence, J. S., & Cordts, S. D. (2013). Identity and specialization as a waterfowl hunter. *Leisure Sciences, 35*, 218–234.
- Seligman, M. E. P. (2011). *Flourish: A visionary new understanding of happiness and well-being*. New York, NY: Simon & Schuster, Inc.
- Selin, S.W., & Howard, D.R. (1988). Ego involvement and leisure behavior: A conceptual specification. *Journal of leisure Research, 20*, 237–244.
- Shin, K., & You, S. (2013). Leisure type, leisure satisfaction and adolescents' psychological well-being. *Journal of Pacific Rim Psychology, 7*, 53–62.
- Spiers, A., & Walker, G. J. (2008). The effects of ethnicity and leisure satisfaction on happiness, peacefulness, and quality of life. *Leisure Sciences, 31*, 84–99.

- Stebbins, R. A. (1992). *Amateurs, professionals, and serious leisure*. Montréal: McGill-Queen's University Press.
- Su, Y., Pan, R. J., & Chen, K. H. (2014). Encountering selves and others: Finding meaning in life through action and reflection on a social service learning program. *Journal of Pacific Rim Psychology*, 8, 43–52.
- Thapa, B., Graefe, A. R., & Meyer, L. A. (2006). Specialization and marine based environmental behaviors among SCUBA divers. *Journal of Leisure Research*, 38, 601–615.
- Theodorakis, N. D., Kaplanidou, K., & Karabaxoglou, I. (2015). Effect of event service quality and satisfaction on happiness among runners of a recurring sport event. *Leisure Sciences*, 37, 87–107.
- Thomas, D. W., & Butts, F. B. (1997). Assessing leisure motivators and satisfaction of international elderhostel participants. *Journal of Travel & Tourism Marketing*, 7, 31–38.
- Trail, G. T., & James, J. D. (2001). The motivation scale for sport consumption: Assessment of the scale's psychometric properties. *Journal of Sport Behavior*, 24, 108–127.
- Tsaur, S. H., & Liang, Y. W. (2008). Serious leisure and recreation specialization. *Leisure Sciences*, 30, 325–341.
- Uysal, M., Sirgy, M. J., Woo, E., & Kim, H. L. (2016). Quality of life (QOL) and well-being research in tourism. *Tourism Management*, 53, 244–261.
- Walker, G. J., Halpenny, E., Spiers, A., & Deng, J. (2011). A prospective panel study of Chinese-Canadian immigrants' leisure participation and leisure satisfaction. *Leisure Sciences*, 33, 349–365.
- Walsh, G., & Mitchell, V. W. (2010). The effect of consumer confusion proneness on word of mouth, trust, and customer satisfaction. *European Journal of Marketing*, 44, 838–859.
- Wang, R., Min, S., & Kim, S. (2013). Fulfillment of sport spectator motives: The mediation effect of well-being. *Social Behavior and Personality: An International Journal*, 41, 1421–1433.
- Wiley, C. G., & Shaw, S. M. (2000). Men's and women's involvement in sports: An examination of the gendered aspects of leisure involvement. *Leisure Sciences*, 22, 19–31.
- Wong, J., Newton, J. D., & Newton, F. J. (2014). Effects of power and individual-level cultural orientation on preferences for volunteer tourism. *Tourism Management*, 42, 132–140.
- Zhong, J. Y., & Mitchell, V. W. (2010). A mechanism model of the effect of hedonic product consumption on well-being. *Journal of Consumer Psychology*, 20, 152–162.