

118 Evaluating the impact of mobile apps on nature-based tourism experiences

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The study focuses on the evaluation of the impact of applications developed for smartphones intended for usage in connection with nature-based tourism (NBT) experience. Outdoor recreationists increasingly use mobile applications to interact with nature by consuming, creating and sharing the content related to NBT experience before, during and after the trip (Wang et al., 2014; Dickinson, Hibbert, and Filimonau, 2016). We argue that both, content and the various elements of mobile apps functionalities show the capacity to enhance major aspects of the NBT experience, such as emotional, social and epistemic experience value, as well as excellence, efficiency and safety (Chekalina, Fuchs, and Lexhagen, 2018). NBT segments utilize various functional elements of mobile apps (either web-based applications or native apps users need to download and install on their smartphones), such as map-based information, weather/avalanche warnings, augmented reality and 360 images, QR-code tags and geocaching, location-based services, near field communication (NFC) and mobile payments, as well as social media integration (Buhalis and Foerste, 2014; Kolas et al., 2015).

Prior research identifies various categories of apps, which can enhance the NBT experience (Chekalina, Fossgard, and Fuchs, 2021). Digital reference books replace printed guides of birds, plants, mushrooms and integrate image recognition and augmented reality technology. The categories of “exercise and training” apps and “map and navigation” apps show similarities in terms of content and functionality. However, the former category focuses on performance, such as pace, distance, elevation or calorie consumption, while the focus of apps in the latter category is on tracks, routes and attractions. Other categories of apps include travel guides, weather apps, games, compass apps, flashlight apps, apps for photo and video, as well as niche social media networks (Chekalina et al., 2021).

The capacity of mobile apps to enhance the NBT experience relates to multidimensional experience value and, specifically, the particularly

nature-based sub-dimensions of value, namely, relaxation, escape, fun, excellence, efficiency, safety, development of knowledge and skills, the joy of being with family and friends, etc. (Chekalina, Fuchs, and Lexhagen, 2018). From the value-co-creation perspective (Vargo and Lusch, 2004), a mobile app installed on a person’s smartphone is an additional resource, which can be integrated with other tourists’ resources (e.g. money, time, skills, equipment) and destination resources (e.g., amenities, activities, attractions) and, thus, contribute to the value of NBT experience. At the same time, Dickinson, Hibbert, and Filimonau (2016) reveal that in the context of NBT experience such as camping, the use of smartphones represents a dilemma. Specifically, at least 50% of campsite tourists view mobile devices as a potential distractor and demonstrate a need for mobile ‘disconnection’ to fulfil the desire to ‘escape’ (Dickinson, Hibbert, and Filimonau, 2016).

The primary research question of our experimental study is asking how the use of a mobile app designed for outdoors impacts various aspects of nature-based tourism experience and, in particular, takes into account the conflict between the needs for disconnection and escape, which are considered essential motives of NBT and outdoor recreationists. Particularly, we designed four scenarios of using a mobile app for a hiking experience before, during and after the trip. An additional base-line scenario describes planning, conducting and remembering a hiking trip without the use of a mobile app. After conducting a pilot test with a student sample in summer 2019, a full-scale panel data collection took place in Sweden during December 2019 resulting in 733 usable responses.

The online survey experiment with independent treatment groups (Table 1) indicates that the use of mobile apps designed for planning the trip and navigating along the route significantly enhances particular aspects of anticipated outdoor experience, such as being prepared for the journey, possibilities for physical exercise and learning new things at the outdoors. At the same time, however,

and in line with the disconnection dilemma as revealed by Dickinson et al. (2016), the use of the mobile app is also perceived as disturbing in fulfilling primary needs of the NBT experience, including relaxation, connection with nature, peace and quietness, slowing down, escaping routing environments, etc.

Interestingly enough, experiment results demonstrate that enhancing the app with a meditation and disconnection functionality not only eliminates the disconnection dilemma but also facilitates anticipation of other aspects of NBT experience, including eudemonic value related to sense of purpose in life and having time for self-reflection, as well as feeling safe and comfortable during the hiking trip (Badran et al., 2017; Walsh et al., 2020).

Dependent Variable	Cumulative % of Variance Explained	Factor Grand Mean ^f	One-way ANOVA		Multiple comparisons					
			F	Sig.	(I) Scenario	(J) Scenario	Mean Difference (I-J)	Std. Error	Sig.	
Factor 1. Relaxation and escape ^a	48,93	4,07	6,125	<0.001	A	AB	0.302	0.104	0.039	
					AB	A	-0.302	0.104	0.039	
						AC	-0.405	0.106	0.002	
						D	-0.408	0.097	<0.001	
						AC	AB	0.405	0.106	0.002
					AC	D	AB	0.408	0.097	<0.001
						AC	D	0.435	0.103	0.001
						ABC	D	0.436	0.101	0.001
D	AC	-0.435	0.103	0.001						
Factor 2. Safe and comfortable ^b	56,46	3,36	6,436	<0.001	ABC	ABC	-0.436	0.101	0.001	
					D	AC	-0.435	0.103	0.001	
						ABC	-0.436	0.101	0.001	
Factor 3. Knowledge and skills ^b	60,38	4,02	4,06	0,003	A	D	0.272	0.085	0.038	
					D	A	-0.272	0.085	0.038	
Factor 4. Eudaimonia ^a	63,11	3,68	4,121	0,003	AB	AC	-0.395	0.117	0.009	
					AC	ABC	-0.356	0.125	0.046	
						AB	0.395	0.117	0.009	
						ABC	AB	0.356	0.125	0.046

Note: The extraction method was principal axis factoring with direct oblimin rotation. KMO Measure of Sampling Adequacy = 0.960.
 The table shows the mean difference significant at the 0.05 level.
 a. – Tukey post hoc test; b. – Scheffé post hoc test.
 c. 1 = strongly disagree; 2 = somewhat disagree; 3 = neither agree nor disagree; 4 = somewhat agree; 5 = strongly agree
 A – plan and navigate; B – journal; C – meditate and disconnect; D – base-line scenario without the use of a mobile app

Table 1. Results of one-way ANOVA with post hoc test comparing five scenarios of mobile app usage on four hiking experience value factors

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