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The role of psychological flow in adventure tourism: sociodemographic antecedents and consequences on word-of-mouth and life satisfaction

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ABSTRACT

While the concept of experience has attracted considerable attention in tourism, the research on *psychological flow*, as a mental state that tourists may derive from extraordinary experiences, has remained limited, especially in the field of tourism marketing. Yet, this concept might have an important role in promoting sustainable forms of tourism. This paper investigates the sociodemographic antecedents and consequences of psychological flow in the context of adventure tourism, which is a sustainable form of tourism due to its connection with nature and the great potential for assuring extraordinary experiences to tourists by considering mountain biking experiences as a research setting. The empirical results reveal that age is a particularly important sociodemographic antecedent: Indeed, respondents at older ages were more likely to experience psychological flow. Furthermore, reaching this mental state, in turn, increased respondents' likelihood to disseminate positive information about their experiences and enhanced their satisfaction with life. Theoretical and operational implications are discussed along with main limitations and directions for future research.

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1. Introduction

Tourism experience is a multidimensional construct that incorporates internal and external factors able to influence tourists' attitudes and behaviors (Walls, Okumus, Wang, & Kwun, 2011). Importantly, in a competitive sector like tourism, it is crucial for marketing managers to design and deliver unique, extraordinary, and memorable experiences that can engage tourists both cognitively and emotionally (Bigné & Decrop, 2019). Indeed, tourists typically look for pleasure and want to get something memorable from every single moment they experience when traveling and visiting new places (Pizam, Reichel, & Uriely, 2001; Vada, Prentice, Scott, & Hsiao, 2020), especially when in close

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contact with nature (e.g. in Weaver, 2011). Consequently, some places are perceived as more appealing than others, as they can carry extraordinary and memorable experiences to incoming tourists (Kirillova, Fu, Lehto, & Cai, 2014; Mossberg, 2007; Ritchie & Hudson, 2009).

Tourism literature has devoted considerable attention to the study of tourists' experiences (Vittersø, Vorkinn, Vistad, & Vaagland, 2000), with several investigations regarding the impact of such experiences on tourists' attitudes and behaviors. Studies in this area of inquiry have considered a variety of contexts, such as cruises (Hosany & Witham, 2010), parks and museums (Gnoth, Bigné, & Andreu, 2006), festivals (Mehmetoglu & Engen, 2011), cultural experiences (Huang, Scott, Ding, & Cheng, 2012) and sport activities (Beedie & Hudson, 2003). Specifically, by considering sport tourism activities, some studies have explored how the natural environment characterizes certain tourist destinations, as well as how perceived sustainability and care for the nature associated with such destinations can contribute to shaping tourists' experiences (e.g. in Weaver, 2011). In this scenario, adventure tourism has been recognized as an interesting way to sustain sustainable tourism due to its characteristics (Higham, 2018). Moreover, extant research on cycle tourism has investigated the environmental impacts of this form of tourism (Goedt & Alder, 2001), especially in terms of nature preservation, low territorial damages and better land-use, which can offer a new point of view about the travel experience, contributing to sustainable tourism practices (Ho, Liao, Huang, & Chen, 2015). However, fewer studies have investigated individuals' motivations to engage in this form of tourism (Lumsdon, 2000; Robinson & Gammon, 2004). Cycling experiences, such as mountain biking, represent an opportunity for tourists to live special experiences, whereby they may interact with natural landscapes, local people, and historic sites while practicing a sporting activity (Lumsdon, 2000). From a managerial perspective, this form of tourism represents an important opportunity for those destination management organizations and tourist companies who want to encourage sustainable tourism and promote local attractions.

Furthermore, empirical evidence suggests that initiatives aimed at promoting natural resources' conservation and biodiversity may be useful to improve tourists' experiences, thus increasing a tourist destination's competitiveness (Fridgen, 1984; Juric, Cornwell, & Mather, 2002). Undoubtedly, certain forms of tourism are inherently connected with nature and, as such, may have a great potential for assuring extraordinary experiences to tourists. This is the case for adventure tourism (Costa & Chalip, 2005; Swarbrooke, Beard, Leckie, & Pomfret, 2003), which includes explorations or journeys aimed at practicing a variety of sporting activities in strict contact with the natural environment, which may require strong commitment, dedication skills and physical efforts (Hinch & Higham, 2001; Hudson, 2003; Ritchie & Adair, 2002). Examples include rafting, biking, boating or hiking, and other adrenaline activities, which allow tourists to fully 'immerse' themselves in the experience they are about to live. As outdoor adventure tourism brings together travel, sport, and outdoor recreation, most of the adventure activities that can be done outside by tourists are related to sport (Beedie & Hudson, 2003).

However, although adventure tourism has been growing in popularity worldwide (WTO, 2014), existing research offers limited empirical evidence as to whether and how the sporting activities typically associated with this form of tourism shape tourists' experiences. In this work, we contribute to the existing literature on this form of tourism by

investigating *psychological flow* as a critical mental state that tourists might experience when engaged in such sporting activities in an adventure tourism context. *Psychological flow* refers to an individual's tendency to feel a sense of 'staying in the flow', with no need to reflect, because the activity itself carries them forward as if by magic (Csikszentmihalyi, 2013). More specifically, we investigate the sociodemographic antecedents of tourists' tendency to arrive at such a mental state following a sporting activity (i.e. mountain biking) played within an adventure tourism context, as well as the consequences of this psychological state, in terms of both a tendency to promote this form of tourism, by sharing positive information about such activities through word-of-mouth (WOM) communications, and life satisfaction in general. We focus on WOM and life satisfaction as they represent two consequences that might contribute to the success of any form of tourism. In an adventure tourism context, individuals who enjoy a particular sporting activity (e.g. mountain biking) might be more inclined to share their experiences and other positive information on this form of tourism with others, through WOM communications, as well as feel happier and, in general, more satisfied with their life. Positive WOM is a relevant marketing phenomenon as it represents a major information source for prospect tourists (Litvin, Goldsmith, & Pan, 2008; Simpson & Sigauw, 2008), contributing to the promotion of this form of tourism. On the other hand, life satisfaction is a socially relevant phenomenon, which is central to human existence and well-being (Pavot & Diener, 2008) and could ideally represent the ultimate goal of tourism experiences (Peluso, Barbarossa, Chieffi, & Guido, 2021), with tourists being more attracted by those forms of tourism that increase tourists' sense of satisfaction with life. Therefore, building on previous research on WOM (e.g. Ladhari, 2007) and psychological flow in tourism (e.g. Frash Jr, Blose, Smith, & Scherhag, 2018), in this study, we investigate whether and to what extent experiencing psychological flow during a certain sporting activity in an adventure tourism context may be positively related to both WOM and life satisfaction.

Through a survey conducted with a sample of mountain bike tourists, we show that sociodemographic consumers' characteristics (in terms of age, education, gender, and expertise) represent a critical factor in outdoor adventure tourism, as it positively relates to psychological flow, with older tourists being more likely to experience this mental state when engaged in mountain biking. Moreover, our results show that higher levels of psychological flow are associated with a greater propensity to share positive WOM and a greater satisfaction with life. Our research makes four main contributions to literature. First, it advances our understanding of how certain sociodemographic variables relate to a critical, yet relatively unexplored aspect of tourist experience, that is, psychological flow. Unlike past research, which mainly focused on the consequences of psychological flow on consumers' perception and behavior (Csikszentmihalyi & Csikszentmihalyi, 1992; Jackson, Ford, Kimiecik, & Marsh, 1998; Lee & Chen, 2010), our research investigates its antecedents by focusing on the role of certain sociodemographic variables, which represent relevant segmentation criteria in tourism markets (Gitelson & Kerstetter, 1990). Specifically, our results document a critical role for tourists' age in determining the intensity of their flow experiences. Second, our research extends current knowledge on tourists' reaction to psychological flow (Cheng, Hung, & Chen, 2016; Chou & Ting, 2003; Frash Jr & Blose, 2019; Lee & Chen, 2010), by showing that, as tourists arrive at such a mental state, they tend to spread positive WOM about their experiences and perceive a greater satisfaction with life. Third, we contribute to the

literature on WOM antecedents (Berger, 2014) by proposing psychological flow as a potential determinant of positive WOM in tourism settings. Fourth, our research contributes to life satisfaction literature (Pavot & Diener, 2008) by showing that a sense of psychological flow experienced in adventure tourism may increase tourists' satisfaction with life, thus contributing to their happiness.

In the next section, we present the conceptual foundations of psychological flow and its potential role in tourist experience. Then, we describe the methodology that we implemented in the empirical study and describe the obtained results. Finally, we discuss our findings and delineate the related theoretical and practical implications, along with limitations and directions for future research.

2. Theoretical background

2.1. Adventure tourism

Adventure tourism is essentially viewed as an extension of adventure/outdoor recreation (Weber, 2001), which entails an interplay between competence and risk (Plummer, 2005). In a broader sense, outdoor adventure tourism experiences include traveling, doing experiences in close contact with nature and, more specifically, practicing sporting activities (Beedie & Hudson, 2003). Walle (1997) posited that adventure tourism is about the quest for insight and knowledge, incorporating a wide series of adventure recreation pursuits and sports, such as backpacking, hiking, sailing, trekking or biking, in which some expertise is required (Ewert & Hollenhorst, 1989; Munt, 1994; Weber, 2001). Specifically, adventure tourism may connect the positive sensations deriving from tourism experience with wellness sensations and a sense of flow generated by adventurous activities, as in sports experiences such as rafting, bungee jumping, mountain biking (see Pomfret & Bramwell, 2016, for a review). Interestingly, Beedie and Hudson (2003) emphasized the role of sport tourism by underlining the idea that holidays for rest and relaxation has shifted to more health-related and quality-of-life experiences, which include active and sports-oriented trips, increasing individuals' involvement with a tourism destination (Filo, Chen, King, & Funk, 2013).

Adventure tourism has grown constantly over the last few decades (Bidder, 2018; Rantala, Rokenes, & Valkonen, 2018; Sung, Morrison, & O'leary, 2000), and currently represents an interesting niche market. However, although over the last decade this form of tourism has attracted the attention of scholars from different disciplines, researchers have started exploring its psychological effects only recently. To illustrate, past research has focused on the relationship between adventure tourism and tourists' need to try new challenges and excitement (Patterson, 2002; Weber, 2001), their motivations and involvement (Jin, Xiang, Weber, & Liu, 2019). Scholars have also investigated the role of challenge (Tsaur, Lin, & Liu, 2013), fear (Carnicelli-Filho, Schwartz, & Tahara, 2010), risk acceptance (Ryan, 2013) and rush (Buckley, 2012). Taken together, these studies suggest that outdoor sport adventure tourism is associated with the concepts of exploration of distant lands and wild experiences such as rowing, rafting, outdoor excursions (Huddart & Stott, 2019).

Nature and outdoor experiences stimulate emotional responses by generating a profound sense of wellness that transcends the initial encounter and contribute to

psychological well-being (Curtin, 2013). Outdoor adventure sport tourism involves great attraction and charm for those who love living in contact with nature, discovering and experiencing new sensations (Pizam et al., 2001). These kinds of adventure tourism experiences typically require interactions with the surrounding natural environment, strong adaptation spirit, and courage (Buckley, 2012; Gyimóthy & Mykletun, 2004). In the following section, we discuss the concept of psychological flow, which might be crucial in enhancing experiences in the context of outdoor sport adventure tourism.

In the context of outdoor adventure sports tourism, the sector of mountain biking seems to be particularly interesting due to its relevance for sporters (Dodson, 1996; Taylor, 2010). Indeed, independently of the place where it is practiced, mountain biking may be an exciting, intense, and physically demanding sport activity in which bikers are faced with self-discovery opportunities that challenge their mental and physical limits (Dodson, 1996). Moreover, the recent proliferation of mountain biking centers, characterized by sophisticated facilities, makes mountain biking more attractive (Taylor, 2010). Importantly, due to its characteristics, mountain biking may offer cyclists the opportunity, during such activity, to reach intensive experiences (Privette & Brundrick, 1991), thus representing an interesting research setting for understanding the effects of sociodemographic variables in stimulating participants' sense of flow.

2.2. Psychological flow

Psychological flow is a positive mental state, based on enjoyment, concentration and low self-awareness, which occurs during active task performance, whereby the individual is totally connected to the performance, in a situation where personal skills equal required challenges (Jackson & Csikszentmihalyi, 1999; Jackson & Marsh, 1996; Mosing et al., 2012). Therefore, psychological flow captures an individual tendency to feel a sense of 'staying in the flow', which may happen when performing an activity that is totally immersive, involving, and enjoyable (Csikszentmihalyi, 2013; Nakamura & Csikszentmihalyi, 2009, 2014). This mental state typically occurs when skills and abilities are balanced with the challenges and effort that the activity requires (Csikszentmihalyi, Abuhamdeh, & Nakamura, 2014).

Therefore, the psychological flow might be a critical construct in outdoor sport adventure tourism by virtue of the deep involvement, challenges, and skills that the activities practiced within this form of tourism typically require. Since psychological flow presumes high levels of attention and enjoyment, it might be considered as a pleasant sensation that could increase well-being (Csikszentmihalyi & Seligman, 2000).

Empirical evidence suggests that individuals' proneness to experience psychological flow may be associated with specific traits that are conducive to flow (Mosing et al., 2012). Moreover, previous studies (Jackson, 1992) highlighted how a positive mental attitude, positive pre-competitive and competitive affect – as a sort of preparative mental state to experience something stimulating and to maintain appropriate focus – are important for getting into flow. Moreover, individuals with higher levels of self-esteem are more inclined to experience psychological flow (Asakawa, 2010).

In sports activities, psychological flow represents an individuals' tendency to feel a state of consciousness that leads such individuals to completely immerse themselves in a certain activity, with no need to reflect, because the sport action itself carries them

forward as if by magic (Csikszentmihalyi, 2013). Thus, individuals who experience psychological flow lose their perception of time, as they are totally immersed in doing something that is challenging and exciting at the same time. These individuals are completely taken by the activity they are performing and tend to feel as if everything around them is disappearing. Because of this sensation, almost nothing around them can distract their attention from what they are doing. There are no more distractions, no negative thoughts, no other urgencies. These sensations may be quite common in people performing certain sporting activities (e.g. bungee jumping, rafting, or mountain biking). In such situations, the concentration and desire to succeed in the goal is maximum and people feel more alive. Some past studies focused on the relevance of psychological flow in sport (Jackson & Csikszentmihalyi, 1999; Kimiecik & Jackson, 2002). In the present research, we investigate psychological flow by considering the context of outdoor sport adventure tourism. Our research aims and objectives are discussed in the following section.

2.3. Mountain biking and adventure tourism

Tourism research has long focused on tourist experience, defined as an escape from the ordinary of daily life (Quan & Wang, 2004) or 'a past personal travel-related event strong enough to have entered long-term memory' (Larsen, 2007, p. 15). Indeed, the ability to deliver positive, pleasant, and immersive experiences have become of paramount importance in tourism marketing (Adhikari, 2015). The natural environment may be a fundamental element that may characterize a sustainable tourism experience (Curtin, 2013). Tourists can live novel and interesting experiences by being involved in outdoor activities that allow them to enjoy the environmental beauties and uniqueness of the visited lands (Bell, Tyrväinen, Sievänen, Pröbstl, & Simpson, 2007; Wolf-Watz, Sandell, & Fredman, 2011). Therefore, an opportunity for destination managers is that of designing and delivering experiences that entail some contact with the natural environment (McGinnis, Gentry, & Gao, 2012). Adventure tourism represents one way for tourism managers to involve tourists in experiences in strict contact with the natural environment (Martin, 2004) such as in mountain biking.

Tourists may differ regarding how they use bicycles on holiday. While some of them may use a bike as a mere means of locomotion to enjoy their vacation in a specific destination, others may use a bike to explore the places around through excursions which put them in contact with nature, as happens, for instance, in mountain biking (Deenihan & Caulfield, 2015; Isnart, 2019). Thus, we proposed mountain biking as a relevant activity in the field of adventure tourism and conducted a survey study by using it as a research setting. Indeed, mountain biking is a physically and mentally involving activity that can play a central role in developing positive and memorable tourists' experience. Specifically, we considered a sample of mountain bike tourists who spent more than one day in visiting naturalistic places with the main purpose of practicing mountain biking in the surrounding area, along rough trails or in difficult terrain (Skår, Odden, & Inge Vistad, 2008).

To date, by considering Italy in which our research has been conducted, mountain biking attention generate an impact attested around 12 billion euros. Bicycles have become increasingly popular in Italy in recent years as a means of transport, with more people regularly cycling to work and in their leisure time, and as for practitioners and tourists, the majority of cyclists in Italy was made up of men (61%), while 40% were women. At

the same time, mountain bike trails in Italy have been profoundly re-adapted to host tourists and practitioners (e.g. as in Finale Ligure, Dolomites, Campiglio; <https://www.singletracks.com/bike-trails/region/italy/?orderby=best&order=DESC>). Due to the peculiarities of this sport activity, these trails assure a perfect direct contact with nature, increasing the mountain biking experiences, as for the case of the Dolomites recognized by the UNESCO as a World Heritage Site, made of rugged rocks able to awake fascinating sensations.

2.4. Research aim and objectives

Based on the foregoing, *psychological flow* might play a central role in adventure tourism. In this form of tourism, the possibility of moving out from the comfort zone – that is, a mental condition in which individuals experience a sense of familiarity, feel comfortable and in full control of the situation, without experiencing any form of risk, stress, anxiety (for a review, see Brown, 2008) – pushes tourists to try adventurous experiences, enjoying some pleasant sensations. Outdoor sport adventure tourists may experience feelings of excitement and pleasure, a combination that might lead to *psychological flow* (Csikszentmihalyi & Csikszentmihalyi, 1992).

However, despite the growing scholarly attention on adventure tourism (Kim, 2012; Wei, Zhao, Zhang, & Huang, 2019), few studies have investigated the role that *psychological flow* might play in this form of tourism (e.g. Jackson et al., 1998; Jackson, Thomas, Marsh, & Smethurst, 2001; Stein, Kimiecik, Daniels, & Jackson, 1995). The present research aimed at enriching current knowledge on *psychological flow* in outdoor adventure tourism by investigating its sociodemographic antecedents and consequences in terms of WOM and life satisfaction. A better understanding of the differential influence of tourists' sociodemographic characteristics (e.g. gender, age) on *psychological flow* as well as of the consequences of this mental state on tourists' propensity to share positive WOM about this form of tourism and life satisfaction could help tourism managers develop more effective targeting and communication strategies. Such strategies could indeed be designed to attract the interest of certain tourist segments that, given their sociodemographic profiles, are more likely to experience *psychological flow* and, consequently, to share positive WOM and feel more satisfied with their life.

Specifically, the research set out to achieve two research objectives. The first objective, regarding sociodemographic antecedents, was to shed light on the differential impact of different sociodemographic variables on *psychological flow*. The second objective, regarding its downstream consequences, was to examine the impact of *psychological flow* on tourists' inclination to share positive WOM about the sporting activities practiced within an adventure tourism context, as well as on tourists' life satisfaction (see Figure 1).

3. Methodology

We developed a structured online questionnaire, which was administered to a sample of 204 Italian mountain bike tourists recruited on specialized Facebook fan-pages and online communities. Mountain biking and cycle tourism is a quite popular form of sport activity within adventure tourism, especially in Italy where this activity has increased substantially over the last few years (Gazzola, Pavione, Grechi, & Ossola, 2018), accordingly to the

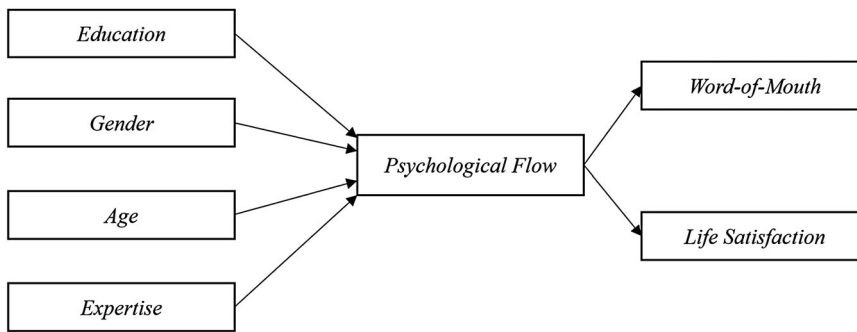


Figure 1. The proposed conceptual framework.

European trends (Terzić, Demirović, Petrevska, & Limbert, 2020). Today, Italy counts about 10,751 mountain bike trails (22,841 km in total; www.trailforks.com). Italy has registered about 77.6 million cycle tourism presences in 2018, which represents 8.4% of the whole tourist movement in Italy (Isnart, 2019).

Respondents were first asked to complete a scale assessing the extent to which they felt a sense of psychological flow when practicing mountain biking. This scale comprised eight items, which were adapted from Jackson and Marsh (1996) and Mosing et al. (2012) and assessed on a seven-point Likert-type scale (e.g. 'I felt like time stopped while I was practicing mountain biking'; anchors: 1 = not descriptive of me at all, 7 = very descriptive of me; $\alpha = 0.81$). The questionnaire included one item, drawn from Reichheld (2003) assessed on seven-point rating scale, which tapped into respondents' tendency to engage in positive WOM in the form of recommendation likelihood (i.e. 'How likely is it that you will recommend practicing mountain biking to colleagues and/or friends?'; 1 = not likely at all, 7 = very likely). The questionnaire also comprised six items that assessed respondents' satisfaction with life, which were drawn from Larsen and Diener (1985) and assessed on a seven-point Likert-type scale (e.g. 'In most ways my life is close to my ideal'; 1 = not descriptive of me at all, 7 = very descriptive of me; $\alpha = 0.89$). Finally, the questionnaire included sociodemographic questions regarding respondents' education level (1 = primary or secondary school; 2 = high school diploma; 3 = undergraduate degree; 4 = postgraduate degree), gender (0 = male; 1 = female), year of birth, along with a question regarding their familiarity with this sporting activity (i.e. number of years since the first experience) and another question regarding whether respondents practiced mountain biking alone or in group (0 = alone; 1 = in group), which served as covariates in the model. The detailed questionnaire is provided in the [Appendix](#).

4. Results

4.1. Sample description

Respondents reported varying levels of education: 48% had a high school diploma, 44% had undergraduate degree (i.e. bachelor's degree), 4.5% reported having a lower education level (i.e. primary or secondary school), and 3.5% reported having a postgraduate-level education (i.e. doctoral or master's degree). Moreover, 39% of respondents

were male and 61% were female. Their age ranged from 19 to 69 years ($M = 42.10$, $SD = 13.57$). Finally, respondents were familiar with mountain biking as they reported they had regularly practiced this activity for 3 years ($M = 3.02$, $SD = 1.75$).

4.2. Analysis

The main statistical analysis assessed the relationships among the variables of interest. We built a structural model in which sociodemographic variables served as the independent variables, which related to psychological flow. The latter variable, in turn, related to both respondents' likelihood to engage in positive WOM and satisfaction with life. Therefore, psychological flow served as the mediator, while likelihood to engage in positive WOM and satisfaction with life served as the ultimate dependent variables. The model also included the two covariates, regarding familiarity with mountain biking and whether respondents practiced this activity in a group, respectively, which related both the mediator and each of the two dependent variables. This model was estimated in a path analysis, using the maximum likelihood estimation procedure, which allowed a simultaneous estimation of all the relationships involved in the model.

The analysis returned acceptable fit statistics: $\chi^2(15) = 27.974$, $p = .022$; Goodness of fit index (GFI) = 0.968; Comparative fit index (CFI) = 0.860; Root mean square error of approximation (RMSEA) = 0.065; Standardized root mean square residual (SRMR) = 0.057 (Hu & Bentler, 1998). The obtained results showed that age was the only sociodemographic variable that exerted a significant positive effect on psychological flow ($\beta = 0.175$, $p = .017$), thus suggesting that respondents at older ages were more inclined to experience flow when engaged in mountain biking. There was also a marginally significant relationship between familiarity with mountain biking and psychological flow ($\beta = 0.128$, $p = .075$). The results also revealed a significant positive relationship between psychological flow and both respondents' likelihood to engage in positive WOM ($\beta = 0.308$, $p < .001$) and satisfaction with life ($\beta = 0.220$, $p = .002$). There was also a significant positive relationship between familiarity and likelihood to engage in positive WOM ($\beta = 0.220$, $p < .001$). All other relationships were nonsignificant ($ps > .10$) (see Table 1).

The analysis also returned the indirect effect of sociodemographic variables on the positive WOM and satisfaction with life via psychological flow. The significance level of these indirect effects was computed using the bootstrapping procedure (Preacher & Hayes, 2008). The obtained results confirmed that age was the only sociodemographic variable that exerted a significant positive indirect effect on both positive WOM ($\beta = 0.054$, $p = .005$) and satisfaction with life ($\beta = 0.038$, $p = .015$), with psychological flow serving as mediator. The covariate regarding familiarity with mountain biking also exerted a significant positive indirect effect, via psychological flow, on positive WOM ($\beta = 0.039$, $p = .041$) and satisfaction with life ($\beta = 0.028$, $p = .042$), respectively.

The results suggest that age is a critical variable in understanding the intensity of flow experiences among mountain bike tourists, with older individuals being more inclined to experience psychological flow and, through this mental state, being more likely to spread positive WOM and perceive greater satisfaction with their life.

Table 1. Results of the path analysis.

Path	Standardized estimate (β)	<i>p</i>
<i>Direct paths</i>		
Education level → Psychological flow	0.004	.953
Gender (0 = male, 1 = female) → Psychological flow	-0.019	.779
Age → Psychological flow	0.175	.017
Familiarity (in years of expertise) → Psychological flow	0.128	.075
Biking in group (0 = alone, 1 = in group) → Psychological flow	0.099	.145
Psychological flow → Positive WOM	0.308	<.001
Familiarity → Positive WOM	0.220	<.001
Biking in group → Positive WOM low	-0.030	.640
Psychological flow → Life satisfaction	0.220	.002
Familiarity → Life satisfaction	0.016	.820
Biking in group → Life satisfaction low	-0.051	.454
<i>Indirect paths (via Psychological flow)</i>		
Education level → Positive WOM	0.001	.903
Gender → Positive WOM	-0.006	.783
Age → Positive WOM	0.054	.005
Familiarity → Positive WOM	0.039	.041
Biking in group → Positive WOM	0.030	.110
Education level → Life satisfaction	0.001	.920
Gender → Life satisfaction	-0.004	.813
Age → Life satisfaction	0.038	.015
Familiarity → Life satisfaction	0.028	.042
Biking in group → Life satisfaction	0.022	.113

Note: $N = 204$. $\chi^2(15) = 27.974$, $p = .022$; GFI = 0.968; CFI = 0.860; RMSEA = 0.065; SRMR = 0.057.

5. Discussion and conclusion

The present research explored the effects of sociodemographic variables on psychological flow and the influence of this mental state on mountain bike tourists' likelihood to engage in positive WOM and satisfaction with life. The obtained results showed that age is a critical factor that influences these tourists' tendency to experience flow in such a way that older tourists are more inclined to arrive at this mental state when engaged in mountain biking. Importantly, higher levels of psychological flow are associated with a greater propensity to share positive WOM about this activity and a greater satisfaction with life. Therefore, our findings suggest that in a context of adventure tourism like that provided by mountain biking, enabling tourists to experience flow can be critical at improving their reactions with positive marketing repercussions on that activity and the destination.

The present research carries several theoretical implications. First, it contributes to the literature on sociodemographic variables and their role in determining psychological flow. While prior studies mainly focused on the consequences of such a mental state on individuals' perception and behaviour (Csikszentmihalyi & Csikszentmihalyi, 1992; Jackson et al., 1998), our work sheds light on the sociodemographic antecedents of psychological flow. As sociodemographic variables are directly observable or detectable, exploring their role in determining psychological flow is relevant to identifying those tourist segments that are more prone to such a mental state. Thus, tourism marketers and managers should be able to recognize such consumer-related when segmenting their target markets. Second, this research extends current knowledge on tourists' reaction to psychological flow (Cheng et al., 2016; Chou & Ting, 2003; Frash Jr & Blose, 2019; Lee & Chen, 2010), by showing that, as tourists experience such a mental state, they tend to spread positive WOM about their experiences and perceive a greater

satisfaction with life. Third, this research contributes to the WOM literature (Berger, 2014), by showing that psychological flow can be a determinant of tourists' likelihood to share positive WOM. Finally, this research underlines that reaching a sense of psychological flow may increase tourists' satisfaction with life, thus contributing to the literature on psychological well-being and happiness (Pavot & Diener, 2008).

Indeed, our results may be relevant both for research and practice because focusing on WOM and life satisfaction as a consequence of adventure tourism experiences could contribute to providing interesting insights for any form of sport and sustainable tourism. Indeed, tourists' life satisfaction deriving by mountain biking activities and the consequent good words spread by those individuals who experience this activity may be interesting to design similar experiences at contact with nature (e.g. as for hiking, canoeing, rafting). Moreover, by investigating the role of psychological flow and, thus, how this sense of full immersion affects the involved tourists may be useful both to segment the target market on the basis of these individual differences and to drive marketers' effort in designing similar experiences able to arise a stronger sense of flow.

This research also offers managerial implications. The obtained results suggest that, in adventure tourism, marketers can enhance tourists' experiences by providing opportunities for tourists to feel a sense of psychological flow. Marketers should consider tourists' age as a key element when developing marketing strategies and designing experiences related to outdoor activities. The results suggest that destination management organizations might increase positive WOM about the activities they offer by leveraging the opportunities deriving from adventure tourism activities, which can enable tourists to feel a sense of flow. Marketing efforts might focus on the development of rural routes in close contact with nature, able to stimulate a full immersion in the experienced activity. Importantly, in developing such offerings, marketers should focus on older tourists by designing communication messages targeted at this market segment. Accordingly, recent studies (i.e. Guido, Amatulli, & Sestino, 2020) also demonstrated how older consumers in managing their finance are prone to invest time and money in leisure, tourism, and exciting activities. Furthermore, an interesting possibility is that, after the global health crisis related to Covid-19, destination management organizations could re-value outdoor sporting activities in strict contact with nature, which may represent as an important resource for future sustainable tourism strategies (Politico Magazine, 2020).

However, this research has also some limitations that offer an opportunity for future studies. As this research considered mountain biking, the obtained results are not immediately generalizable to other forms of adventure tourism. Future studies could try to replicate our results in other adventure tourism contexts, or in some other form of slow tourism involving a direct contact with nature as well as with native and local people (e.g. Sestino, Pino, & Guido, 2021). Indeed, other potential contexts where the relationship between sociodemographic variables and psychological flow could be explored by extending the setting considering sport as a hobby or in occurrences in which individuals need to be relaxed, seeking for a sense of transport in challenging and emotional activities (Mosing et al., 2012; Slimani et al., 2016). Furthermore, as this research considered an Italian sample of tourists who practiced mountain biking in Italy, future studies could try to strengthen this study's findings by analyzing other geographical contexts. Indeed, previous research has shown that tourists with different nationalities or cultural backgrounds may have different attitudes or perceptions of

tourist activities and attractions (Pizam & Sussmann, 1995). One final potential limitation regards the measurement scales. Specifically, this research assessed likelihood to engage in positive WOM using a single item. Although that item was derived from an established measurement approach developed in WOM literature (Reichheld, 2003), future studies could replicate our research by using multi-item scales of WOM, or considering electronic WOM (Schuckert, Liu, & Law, 2015), which occurs in the form of online reviews that are written and transmitted via the Internet to individual consumers or online communities (Zeng & Gerritsen, 2014), and represents a relevant information sources for tourists.

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Appendix

Psychological flow (Jackson & Marsh, 1996; Mosing et al., 2012)

On a scale from 1 to (where 1 = 'Not descriptive of me at all' and 7 = 'Very descriptive of me'), please indicate how much the statements below are able to describe what you actually feel when you practice mountain biking.

- I have the clear will to reach the goal
- I almost lose awareness of myself
- I am in total control of the situation
- I lose track of time passing
- I feel that I am doing everything in the best way
- I am very focused on what I do
- I completely forget about personal problems
- I feel totally taken by the situation and what I do

Word-of-mouth (WOM) (Reichheld, 2003)

- How likely is it that you will recommend practicing mountain biking to colleagues and/or friends? (1= 'Not likely at all' and 7= 'Very likely')

Life satisfaction (Larsen & Diener, 1985)

On a scale ranging 1–7 (where 1 = 'Not descriptive of me at all' and 7 = 'Very descriptive of me'), please indicate how well the statements below are able to describe what you think about yourself and your life in general, when you practice mountain biking.

- The life I live is close to the ideal one
- My living conditions are excellent
- I am satisfied with my life

- So far, I've gotten the important things I've always wanted in life
- If I could go back in time, I wouldn't change anything in my life
- I am a happy person

Familiarity

How long have you been practicing mountain biking?: _ _ (number of years)

Gender: Male/Female

Year of birth: _ _ _ _

Education:

- Primary or secondary school
- High school diploma
- Undergraduate degree
- Postgraduate degree

Activity in group: Alone/In group