



Exploring the influence of audiences' subjective well-being in sport event: the moderating role of leisure engagement

Explorando a influência do bem-estar subjetivo do público em eventos desportivos: o papel moderador do envolvimento no lazer

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Abstract

Drawing on leisure coping theory, this study examines how negative impacts of sport events influence audiences' subjective well-being, which further affects the support of the event. Leisure engagement is further employed to test its moderating effect of this relationship. By distributing questionnaires on-site during the on-going four days of the Macau Grand Prix 2018, 620 valid audiences were surveyed. The findings suggest that (a) audiences' perceived negative impact of the Macau Grand Prix negatively influence their subjective well-being, (b) when the leisure engagement was low, the negative relationship between negative impact of the Macau Grand Prix and audiences' subjective well-being was alleviated, and (c) the indirect effects of audiences' perceived negative impact on support for sport events via subjective well-being was buffered by leisure engagement, such that the indirect effects were only found in dyads with lower leisure engagement, but not in dyads with higher leisure engagement. Theoretical contribution and practical implications for Macau government and organization of the Macau Grand Prix were also discussed.

Keywords: Subjective well-being, leisure engagement, sport event, support for events.

Resumo

Com base na teoria do envolvimento no lazer, este estudo examina como os impactos negativos dos eventos desportivos influenciam o bem-estar subjetivo do público, o que afeta ainda mais o apoio ao evento. O envolvimento no lazer é ainda utilizado para testar o efeito moderador desse relacionamento. Ao distribuir questionários no local durante os quatro dias do Grande Prémio de Macau de 2018, foram analisados 620 inquéritos válidos. Os resultados sugerem que: (a) o impacto negativo percebido pelas audiências do Grande Prémio de Macau influencia negativamente o seu bem-estar subjetivo; (b) quando o envolvimento no lazer é baixo, a relação negativa entre o impacto negativo do Grande Prémio de Macau e o bem-estar subjetivo das audiências foi aliviado; (c) os efeitos indiretos do impacto negativo percebido pelo público no apoio a eventos desportivos por meio do bem-estar subjetivo foram amortecidos pelo envolvimento no lazer, de modo que os efeitos indiretos foram encontrados apenas em díades com menor envolvimento no lazer, mas não em díades com maior envolvimento no lazer. Também são discutidas contribuições teóricas e implicações práticas para o governo de Macau e para a organização do Grande Prémio de Macau.

Palavras-chave: Bem-estar subjetivo, envolvimento no lazer, evento desportivo, apoio a eventos.

1. Introduction

Countries and cities are actively competing to host mega-events (such as the Olympic Games), which not only bring considerable economic and social benefits but also promote better images to other countries and cities. As a special sport event with a history in Macau, the Macau Grand Prix (MGP) is the only street circuit racing event in which both cars and motorcycles participate. Unlike some mega-events, this kind of sport event also has a wide range of economic and social impacts due to special venues (street competitions). Previous researchers have conducted various research on MGP, such as marketing strategies (Li, 2009), residents' perception of the impact of the event (Zhou, 2010), management and development strategies (Tang & Lee, 2011), and Sport- event-related recreational behaviors (Tao

& Zhang, 2016). The negative effects mentioned in the research results have attracted wide attention. Macao officials proposed to stop MGP because of traffic problems, noise problems, security risks and other issues from MGP (Tao & Zhang, 2016; Tang & Lee, 2011; Zhou, 2010). It can be seen that these effects will not only directly reduce the satisfaction of visitors' experience in Macau but also indirectly affect the subjective well-being (short for SWB) of tourists by intensifying the conflict between host and guest.

Leisure engagement refers to the engagement frequency or type in a leisure activity, which was considered to be related to SWB (Wheatley & Bickerton, 2017). Prior studies stated that SWB can be improved by increased leisure engagement, and some of them confirmed the role of leisure engagement as a mediator between job stress and their SWB among



students and workers (e.g., Lin, Huang, Yang, & Chiang, 2014; Kuykendall, Tay, & Ng, 2015; Schulz, Schulte, Raube, Disouky, & Kandler, 2018; Wheatley & Bickerton, 2017; Zhang & Zheng, 2017). In addition, the moderating effect of leisure engagement was asserted to be able to condition the work-family conflict and SWB (Chen, Jian, Yen; 2013). But the moderated effect of leisure engagement in tourism research remains under-explored. Support of tourism, as an important aspect of tourism attitude, was positively affected by SWB on one hand, and negatively impacted by the negative phenomenon brought by tourism on the other (e.g. Jordan, Vogt, & DeShon, 2015; Nunkoo & So, 2016; Chi, Cai, & Li, 2017). However, the moderating role of leisure engagement in negative impacts, SWB, and the attitude of support is unclear.

To create the image of “World Tourism and Leisure Center”, Macao has increased the promotion of MGP by using various multimedia formats as well as more MGP-related recreation activities in recent years. Tao and Zhang (2016) stated that people were more likely to support MGP by increasing the engagement of MGP-related recreation. MGP used urban roads as the competition track while this is perceived to have increased its attractiveness, it also brought about many negative impacts. Therefore, leisure engagement plays a salient role between the relationship of negative impacts and the audiences’ perceived SWB. Increasing MGP-related activities may win more support for MGP, however, leisure engagement is receiving relatively scarce academic attention in SWB related literature.

This paper aims to explore whether leisure engagement can moderate the relationship between the negative impact of MGP and audiences’ SWB after participating in the MGP, and also to further investigate the audience support level of MGP. The importance of this research is two-fold. First, it extends the research of SWB in the context of sport events by empirically confirming the relationship between the negative impact of sport events and SWB. Secondly, this study deepens the understanding of the salient role of leisure engagement by investigating its moderating effect between and the negative impacts brought by sport events and the audiences’ perceived SWB. Findings of this research can help event organizers and tourism officials effectively plan and promote sport events for more sustainable development.

2. Theoretical background and hypothesis

2.1 Sport event - Macau Grand Prix: with an emphasis on the impact research

Sport events, considered by many studies, can promote the tourism industry of the host city with enhanced media coverage to obtain a better destination image and economic revenue (e.g. Fourie & Santana-Gallego, 2011; Chalip, Green, & Hill, 2003). Sport events have increasingly become a new

tool for attracting visitors, bringing revenue to the city and improving competitiveness, especially when hosting mega sports events such as the Olympic Games and World Cup (e.g. Fourie & Santana-Gallego, 2011; Lee & Taylor, 2005). However, studies showed that ‘mega-sport events promoted tourism, but the profit varies depending on the type of mega-sport event, the participated countries and whether the sport event was held in the peak season or off-season. With increasing scale, the potential for sport events to create negative impacts also increases (Higham, 1999). For example, crowding and congestion of tourism infrastructure associated with sport events, and local lifestyles disrupted by sport events as well as security issues.

Beginning in 1954, the MGP is one of the world's most prestigious racing events as the annual grand sporting event in Macau's sports and sports world. This event is known for its Guia Circuit. The runway is 6.2 kilometres long of mainly downtown streets, and the track is curved and narrow, which has attracted many racers to challenge (Li, 2009; Tang & Lee, 2011; Tao & Zhang, 2016). Zhou (2010) pointed out that the MGP has brought a more diversified image to Macau city. At the same time, the sport event also raises concerns about a series of social and environmental issues. For example, traffic congestion caused by events, noise problems and crowding problems in public places, environmental damage and other environmental problems (Zhou, 2010; Tang & Lee, 2011). In addition, it also brought on social problems such as increased safety hazards and soaring local commodity prices (Zhou, 2010; Mao & Huang, 2016).

2.2 Subjective well-being and sport event

Diener (1984) defined SWB as an individual's assessment of the overall quality of life using his own defined criteria. It combined emotional reactions, satisfaction in various fields such as work and communication, and overall life satisfaction. The relationship between sport events and SWB is now receiving increasing attention among academicians. There are two streams of researches in this area, with a different focus on the athletes and sport audience. For example, Kavetsos and Szymanski (2010) used data from 12 European countries for three different mega-events (the Olympic Games, the FIFA World Cup, and the UEFA European Championship) to show that events can enhance well-being. Players’ SWB has been improved after the event. The successful challenge of the players' goals was proven to enhance plays’ SWB in the case of flying disc games as well, which was reflected in their stronger influence on the attitude and confidence of things in daily life (e.g., Wang, Chen, & Li, 2011). Similarly, the SWB of the audiences’ can also be affected by participating in the sport event. Compared with the audiences watching the live broadcast of basketball, the audiences watching on-site can gain more happiness and satisfaction. The experience of direct viewing, interaction of the atmosphere in the basketball competition



can have a more positive impact on the audiences' SWB (Ding, 2013). The audience's satisfaction was also confirmed to be closely related to SWB (Kao, Chen, Lu & Cao, 2016). The unsatisfactory experience could be triggered when the number of spectators participating in the sport event increased, resulting from the hardware facilities problem and traffic planning of the event (Lee, Lu & Ni, 2010). Although studies have investigated the different negative effects of sport events, the relationship between the negative effects of sport events and SWB was rarely mentioned.

Previous studies stated that not all negative impacts brought about by tourism events affect SWB (Chi et al., 2017). But the MGP is one of a few street race routes in the world, which is held in the Macau Peninsula with space limitations (9.1km²) and a high population density (17,310/km²) (Zhou, 210). Regarding this, the negative phenomena caused by the MGP could be more prominent, which affected the tourist activities of the event audience, thus affecting their SWB. Therefore, the following hypothesis is developed:

H1. Audiences' perceived negative impacts of the MGP negatively influence their SWB.

2.3 Leisure engagement

Leisure engagement refers to the extent to which one participates in leisure activities, especially, the amount of time, diversity, or frequency of one's participation in leisure activities, such as social, sports, games, cultural experiences, and so forth (Kuykendall et al., 2015; Wheatley & Bickerton, 2017; Wu & Wang, 2006). Beard and Ragheb (1983) divided the types of leisure engagement into six domains including "mass media", "cultural activities", "sports", "social activities", "outdoor activities", and "personal hobbies". Numerous studies have shown that leisure engagement is closely related to physical, cognitive, and affective well-being (e.g. Kuykendall et al., 2015; Schulz et al., 2018; Wheatley & Bickerton, 2017). The frequency and diversity of leisure engagement are more strongly associated with SWB than the time spent (Kuykendall, et al., 2015). Mannell and Kleiber (2013) believed that when people have frequent engagement in leisure activities, they tend to have higher satisfaction with the overall life. In the studies of sport and leisure, sport and recreational exercise have been considered to be important factors in improving health and SWB (Wheatley & Bickerton, 2017). Through sport and recreational exercise, individuals were more prone to stay physically and mentally healthy and to gain a better sense of SWB (Kavetsos, 2011), especially in activities that require social interaction (Schulz et al., 2018; Hamermesh, 2002).

Very few studies have investigated the moderating role of leisure engagement in SWB, among which Iwasaki and Mannell's (2000) theory of leisure coping strategies seems to be influential and convincing, which suggests that leisure

activities can regulate negative life stress and produce positive adjustment to maintain physical and mental health. For example, Trainor, Delfabbro, Anderson and Winefield (2010) indicated that leisure can assuage employees' stress and provide an occasion to increase positive mood or decrease negative mood, thereby elevating SWB. Similar results were found in the study of students' academic stress and SWB. To cope with the negative emotions associated with academic pressure, it was suggested that actively engaging in leisure activities was vital to promote and enhance daily emotional well-being (Zhang & Zheng, 2017). This theory was confirmed by another study stating that leisure engagement of parents moderated the relationship between parenthood and SWB (Roeters, Mandemakers, Voorpostel, & Valk, 2016). However, Schulz et al. (2018) indicated that high levels of leisure engagement were related to lower levels of SWB, but high interest in leisure activities mitigated this effect. In other words, the intrinsic motivation of leisure activities was the key driver behind SWB. Chen (2016) discussed the influence of new media users' engagement in leisure sports activities on SWB and indicated that using new media to participate in leisure sports activities would enhance SWB, but excessive use of new media or participation in recreational sports would reduce SWB. Even studies have shown that too much leisure engagement was not conducive to improved SWB, but it was unclear of the moderation of different levels of leisure engagement on the negative impact of MGP and the audience's SWB. Therefore, the following hypothesis is developed:

H2. Leisure engagement of audiences moderates the relationship between audiences' perceived negative impact of the MGP and their SWB, such that the negative relationship is stronger among audiences with lower leisure engagement, compared to those with higher leisure engagement.

2.4 Support for event

Support is an important aspect of attitude (e.g. Gursoy, Kim, & Uysal, 2004; Nunkoo & Ramkissoon, 2011). The relationship between SWB and the supportive attitude were overlooked in social exchange theory (Jordan, Vogt, & DeShon, 2015; Nunkoo & So, 2016). However, there is still a small amount of literature pointing out that SWB is linked to a supportive attitude in tourism. For example, Andereck and Nyaupane (2011) and Woo, Kim and Uysal (2015), individuals with high life satisfaction (cognitive well-being) are more likely to support tourism and events. In the study of residents of destination, their SWB has a positive influence on tourism support (Liang & Hui, 2016; Ridderstaat, Croes, & Nijkamp, 2016; Chi et al., 2017). Some scholars compared the level of SWB before and after traveling, they found that the life satisfaction (eg. Gilbert & Abdullah, 2004; Strauss-Blasche, Ekmekcioglu, & Marktl, 2000) and positive



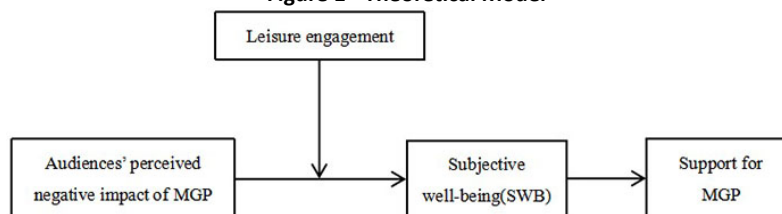
emotions of tourists after traveling has been significantly promoted (Gilbert & Abdullah, 2004), while the relationship between the SWB and the support for tourism needs to be further scrutinized.

Leisure coping strategies was widely recognized for alleviating negative problems such as work stress and job burnout (e.g Cheng, Chang, & Chan, 2018). Different from Avoidant Leisure Coping Style (ALCS), Planned-Breather Leisure Coping Style (PBLCS) as a problem-centered response could produce more positive results (Gaudreau & Blondin, 2004; Tsaur & Tang, 2012). In other words, planned leisure activities can not only help an individual to reduce fatigue but also enhance their well-being and contribute to a positive attitude to daily life (Tsaur & Tang, 2012). However, a study explored the mental health of college

students with different leisure activities and found that more sport events were associated with lower depression levels, and the positive role of leisure engagement was mainly to reduce depression, not to increase happiness (Hu, 2015). Meanwhile, studies indicated that leisure engagement is related to the attitudes of support, with the increase of the type of leisure activities leading to more tolerance and support towards the event (Tao & Zhang, 2016). Therefore, the following hypothesis is developed:

H3. The indirect effects from audiences' perceived negative impact of the MGP to their support for MGP via SWB are weaker among audiences with lower leisure engagement, compared to those among audiences with higher leisure engagement. The model of hypothesis is presented in Figure. 1.

Figure 1 - Theoretical Model



3. Method

3.1 Sample

Respondents who participated in the 65th MGP were surveyed through convenience sampling in November 2018. Since the event was only held for four days (from 15th November to 18th November), 10 well-trained research assistants were divided into five groups, and paper questionnaires were distributed in three auditoriums (Lisboa Bend Stand, Grandstand, and Reservoir Stand). Upon introducing our study objective and receiving their consent, we distributed the questionnaire to each participant. To increase the response rate, each participant was given a voucher for a chain restaurant (valued at approximately US\$1.3) as a token of appreciation upon the completion of this survey.

3.2 Measures

This questionnaire is composed of five parts including demographic information, leisure engagement, negative impacts of the event, SWB, and support for the event. The original measurements for the study variables were developed in English, thus a translation/back-translation procedure (Brislin, 1980) was conducted to translate them into Chinese. The demographic information of respondents mainly included gender, age, and types of audience (local residents or tourists, general audience or fans). The last four parts were measured via five-point Likert scales (anchored by 1 = strongly disagree to 5 = strongly agree).

The part of leisure engagement was measured by four items evaluating type, frequency and information searching of leisure activities in the MGP (Tao & Zhang, 2016). A sample item is "I used multimedia (e.g television, internet, etc.) to find information about the sport events (MGP)". Previous researches adopted varied measurements either single or mixed items, including frequency, time, costs, diversity, and information search (Ding, 2013). Considering that MGP is a four-day sport event, which is different from other daily leisure activities, previous measurements of leisure engagement (i.e., Lin & Cheng, 2014; Liu, Hung, Lee & Chen, 2014) were adapted to suit the current research context. First, in recent years, during the duration of the MGP, more and more MGP-related fringe activities were launched in different regions of Macau, including Motorcycle Show, Supercar and Road Sport Show, Information & Photo Exhibition of MGP, Grand Prix Carnival and TV screen projecting the MGP on live (Tao & Zhang, 2016). All of these allow participants a more enriched and immersed leisure environment. Second, as a long-established sports event, not only the traditional media provides advertising information, but also several new media platforms such as WeChat public account are also coming into service, releasing and updating relevant information or organizing sort of online activities for entertainment. Audiences could learn about MGP information in a variety of interactive ways. Third, in the new media era, social networking has become an indispensable leisure life. Some studies pointed out that the time spent on WeChat significantly and directly impacts users' SWB (Pang, 2018). Therefore, sharing MGP-related



information on social platforms was also a kind of leisure engagement.

The negative impact of the MGP was evaluated using a four-item measurement derived from previous studies. The street race was what makes MGP special and regretfully one of the reasons behind many negative phenomena (Li, 2009; Zhou, 2010; Tang & Lee, 2011). The track passed through the central business district, tourist areas and residential areas in Macau (Li, 2009). Negative phenomena caused by events, especially sports events range from economic issues (such as financial burdens and price rise), environmental issues (such as noise problems and traffic congestion), to social issues (such as increased safety hazards) (Zhou, 2010; Tang & Lee, 2011). A sample item is "Noise levels are increased during the sport event (MGP)."

Cognitive well-being (CWB) and the affective well-being (AWB) are widely used to evaluate SWB (e.g., Yolal, Gursay, Uysal, Kim, & Karacaoğlu, 2016; Chi et al., 2017). The CWB scale was modified to fit the sport event (MGP). A sample item is used "In this event (MGP), I accomplished my purpose of the experience and this experience has enriched me in some ways". The scale of AWB was composed of 5 different items, including happy, active, excited, enthusiastic and thrilling. The items of AWB were measured via five-point Likert scales (anchored by 1 = not at all to 5 = extremely).

For many years, the MGP has been denounced for its dangers, and many serious accidents caused. Therefore, voices against MGP already existed (Li, 2009; Zhou, 2010; Tang & Lee, 2011). The items of "Support for event" was measured by adapting the scale of "Support for tourism" by Chi et al. (2017). The items showed the level of the respondents' support for the MGP, and even other events in Macau. A sample item is "I support the Macau Grand Prix". In addition, the items contained the level of respondents' support for a series of related initiatives A sample item is "Macao should enlarge and support different types of events development".

3.3 Data analysis

Unlike the traditional approach in SPSS, which requires step-by-step verification of mediation and moderation effects, PROCESS can accomplish this in one step. In addition, PROCESS can also handle complex models such as multi-mediating model, multi-moderating model, moderated mediation model, etc. PROCESS provides researchers with more than 70 models, which presented in Model Templates for PROCESS for SPSS and SAS (Hayes, 2013). Our study adopted this software for data analysis by selecting an appropriate corresponding model followed by setting independent, dependent, intermediate and moderating variables. Model No.7 provided in this software illustrates a

moderated mediation relationship templates for PROCESS for SPSS (Hayes, 2013), which is deemed to be appropriate for our research aim. Data analysis was conducted in three major phases. First, in the preliminary data analysis, all variables were examined for data entry accuracy, missing values, outliers, and normality. Second, we performed reliability analyses, validity analyses and correlation analyses to ensure the reliability and validity of the data and understand the interrelationships among the key variables. Lastly, we performed the hypotheses test which the proposed moderation effect was tested with Hayes PROCESS macro (Preacher, Rucker, and Hayes 2007). The PROCESS macro produces bootstrapped unstandardized regression output, as well as estimates of the effect of the focal predictor variables at values of the moderator variables (Hayes, 2013; Hayes & Matthes, 2009; Preacher, Rucker, & Hayes, 2007). More specifically, the moderation regression model was estimated with SWB as the outcome and negative impact of MGP as the independent variable, moderated by leisure engagement. The PROCESS macro produces squared multiple correlations for the model that includes all interaction terms and the variances that are additionally uniquely associated with each interaction item. The PROCESS macro generates conditional effects or simple slopes for the focal predictor at low (below the mean), moderate (sample mean), and high (above the mean) values of the moderators, resulting in a set with three groups to visualize statistically significant interactions (Hayes & Rockwood, 2017).

The bootstrap method constructs a confidence interval for indirect effects by repeating thousands of random resampling. In the upper and lower bounds of the 95% bootstrap confidence interval of the indirect effect, while the interval is completely above or below zero, the intermediation statement is supported, and the confidence interval across zero means that the influence of X on Y cannot be operated by M (Hayes & Rockwood, 2017). Analyses were performed with SPSS V24, AMOS V22, and SPSS macro PROCESS V3.2.

4. Results

4.1 Personal profile and reliability test

Of the 660 questionnaires distributed, 620 effective questionnaires were returned, representing a response rate of 94%. Among the respondents, 67.9% were male, 62.9% were young people aged 18-34, 57% were local audiences, and 33% were MGP's fanatics who have participated in MGP more than 3 times. The reliability test (Table 3) suggested that items under each construct demonstrated substantial inner consistency (0.80-0.92 > cutoff value 0.70). Table 1 presents the basic information of all measurements.

**Table 1 - The basic information of measurement**

Factors	Items	Mean	SD
Negative impacts	NI1.The price of goods/ cost of living increases during the sport event (MGP).	2.51	1.25
	NI2.Noise levels are increased during the sport event (MGP).	2.45	1.15
	NI3.Car/ bus/ truck/ RV traffic increases during the sport event (MGP).	3.30	1.32
	NI4.Crimes and safety worries increases during the sport event (MGP).	3.21	1.28
Leisure engagement	LE1.I actively participated in the sport event.	2.74	1.14
	LE2.I used multimedia (e.g television, internet) to find information about the sport event (MGP).	2.79	1.09
	LE3.I tried my best to attend similar events (e.g Motorcycle Show, etc.).	3.04	1.18
	LE4.I shared the messages of the sport event (MGP) with my family and friends.	2.84	1.40
Cognitive well-being	CWB1.Overall, I feel this sport event (MGP) has enriched my life. I'm really glad that i participated in this event.	3.27	1.21
	CWB2.In this sport event (MGP), I accomplished my purpose of the experience and this experience has enriched my in some ways.	3.38	1.21
	CWB3.This sport event (MGP) was rewarding to me in many ways that I feel much better about things and myself with this event.	3.03	1.29
Affective well-being	AWB1. Happy	2.99	1.35
	AWB2. Active	3.65	1.15
	AWB3. Excited	3.91	1.17
	AWB4. Enthusiastic	4.33	0.84
	AWB5. Thrilling	4.09	0.99
Support for event	SE1.I support the Macau Grand Prix.	4.24	0.97
	SE2.Macao should invest more special leisure activities.	4.20	0.98
	SE3.Macao should invest more in developing the sport events.	4.17	1.01
	SE4.I support Macao to become an international leisure tourism city.	4.17	0.93
	SE5.Macao should think of all types of events development.	3.97	1.10

4.2 Confirmatory Factor Analysis

Confirmatory factor analysis was conducted to evaluate the distinctiveness and convergence of the study variables with AMOS V22. The first model consisted of four distinctive factors, including the negative impact of event, SWB, leisure engagement and support for event. The second model included two factors, with one factor including the items of the negative impact of event and leisure engagement, and the other factor

including the items of SWB and support for event. The last model included all items used to measure the main variables under one general factor. The results of confirmatory factor analysis are presented in Table 2 with the four-factor-model fit better than the rest. Hereby, confirmatory factor analysis results showed support for the discriminant validity of the employed model in this study. Additionally, all the factor loadings in the four-factor model were significant; the results provided support for the convergent validity of each study construct.

Table 2 - Confirmatory Factor Analysis

models	χ^2	df	CFI	NFI	NNFI	RMSEA
Four-factor model	778.87	362	0.91	0.85	0.90	0.08
Two-factor model	2597.12	169	0.73	0.72	0.70	0.16
One-factor model	2661.95	17	0.72	0.71	0.69	0.15

Note. N = 620. CFI = comparative-fit index; GFI = goodness of fit index; NNFI = non-normed fit index; RMSEA = root mean square error of approximation; SRMR = standardized root mean square residual.

4.3 Correlation analysis

We performed correlation analyses to examine the associations among the key variables. Negative impact was negatively correlated with other factors (SWB $r = -0.19$, $p < 0.01$; LE $r = -0.16$, $p < 0.01$; SE $r = -0.54$, $p < 0.01$). SWB ($r = 0.18$, $p < 0.01$)

and support for event ($r = 0.17$, $p < 0.01$) were positively correlated with the moderator, namely, leisure engagement. The correlation between SWB and support for event was positive ($r = 0.42$, $p < 0.01$). Table 3 presents the details of the reliability test and the correlation results.

Table 3 - Reliability, Correlations, Mean Scores and Standard Deviations

Variable	M	SD	1	2	3	4
NI	2.91	0.76	0.81			
SWB	3.55	0.75	-0.19**	0.92		
LE	2.85	0.95	-0.16**	0.18**	0.88	
SE	4.15	0.81	-0.54**	0.42**	0.17**	0.80

N=620 - Cronbach's alpha coefficients are presented in boldface on the diagonal

NI: negative impact; SWB: subjective well-being; LE: leisure engagement; SE: support for event

** $p < 0.01$



4.4 Tests of Hypotheses

The results of the regression analysis showed that a negative relationship between audiences' perceived negative impact and SWB ($\beta = -0.21$, $p < 0.001$), supporting Hypothesis 1. The hypothesized interaction leisure engagement on the negative impact of MGP and SWB was significant ($R^2 = 0.02$, $F = 11.24$, $p = 0.001$). Results indicated that negative impact of MGP was related to SWB with lower leisure engagement (moderating effect = -0.22 , 95% CI $[-0.30, -0.14]$, the confidence interval did not contain zero, see Table 4). The interaction was examined using Johnson and Neyman's (1936) approach which can avoid the need to arbitrarily define "low", "moderate", and "high" values (Bauer & Curran, 2005; Hayes & Matthes, 2009). More specifically, post hoc analyses, using the Johnson-Neyman's approach (Johnson & Neyman, 1936; Preacher, Curran, & Bauer, 2006), revealing that when leisure engagement scores was 3.43 and below, the moderating effect was supported on the negative impact of MGP and SWB (Preacher, Rucker, and Hayes

2007). Thus, Hypothesis 2 is partially supported. The direct effect of negative impact on support for MGP was significant (direct effect = -0.36 , $p < 0.001$, see Table 4). Resorting to the Johnson- Neyman technology (Johnson & Neyman, 1936), we then conducted the moderated mediation analyses in one step with Bootstrap tests. As can be seen in Table 4, when leisure engagement was low (-1 SD) (indirect effect = -0.08 , 95% CI $[-0.12, -0.04]$) or at the mean (indirect effect = -0.05 , 95% CI $[-0.07, -0.02]$), their confidence interval did not contain zero. This means that the intermediation statement was supported. But when leisure engagement was high ($+1$ SD) (indirect effect = -0.01 , 95% CI $[-0.04, 0.02]$), and the confidence interval contained zero, it signifies that the influence of NI on support for the event could not be operated by SWB (Hayes & Rockwood, 2017). The results indicated that SWB mediated the effect of audiences' perceived negative impact on support for the event when leisure engagement was below 3.43. Therefore, H3 is partially supported. The detailed results are presented in Table 4.

Table 4 - Moderation analyses and moderated mediation analyses results

Variable	Conditional effects of the focal predictor at values of the moderator			
	Coefficient	SE	LLCI	UCLI
Leisure engagement				
- 1 SD	-0.22	0.04	-0.30	-0.14
mean	-0.13	0.03	-0.18	-0.07
+ 1 SD	-0.03	0.04	-0.11	0.04
	Direct effect			
Negative impact on support for MGP	-0.36***	0.03	-0.42	-0.31
Leisure engagement				
	Conditional indirect effect			
- 1 SD	-0.08	0.02	-0.12	-0.04
mean	-0.05	0.01	-0.07	-0.02
+ 1 SD	-0.01	0.01	-0.04	0.02

Note: * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$; bootstrapping = 5000

5. Conclusion

The present study found that audiences' perceived negative impact of the MGP negatively influences their SWB. When leisure engagement was below 3.43, the negative relationship between MGP's negative impact and SWB was alleviated. At the same time, the SWB of the audiences positively influenced the support for the event under the buffer of leisure engagement.

5.1 Theoretical implications

A previous study showed that the SWB of residents was not affected by the negative tourism impact in destinations (e.g., Chi et al., 2017). Different from these findings, our study showed a significant negative relationship between the SWB of the audience and the negative impact of MGP. This enriches the content of SWB in sport events study. The reason accounting for this difference could be the result of case and context-specific of this research. Due to the geographic intensity of Macao, the functional division of the land was not obvious, so the environmental carrying capacity was under tremendous pressure. Besides, during the MGP period, most of the roads on the Macao Peninsula are shut down from the public transportation system, which imposed more direct and serious

negative impacts, thus affecting the SWB of the audience.

The moderating role of leisure engagement in the sport event is substantiated in this study. Partly different from the hypothesis, when leisure engagement is low, the effect of moderating on the relationship of the negative impact of sport events and SWB is established. This finding is similar to the results which confirmed that a high level of leisure engagement would reduce the SWB by previous articles (Schulz et al., 2018; Chen, 2016). This result can be interpreted from the following three aspects. First, the leisure engagement of MGP's audience is relatively low (mean=2.78), this represents a lower frequency of audience participation in MGP-related leisure activities. Audiences may experience more negative impacts when participating in MGP-related activities arising from traffic issues (Tao & Zhang, 2016; Li, 2009). As a result, with the upgrading of leisure engagement, the negative impact perceived by the audiences will also increase, and the interaction between these two factors cannot significantly affect the SWB. Second, people experienced increased positive effect after sharing positive events in social media, but they also increased negative affect after sharing negative events (Choi & Toma, 2014). MGP was a high-risk sport event, so it is not rare that unfortunate accidents often



occurred, which are more likely to be publicized or even exaggerated to gain more public attention. With the facilitation of social media, both good and bad information would spread more widely on the internet. When the audience shared negative information, their SWB were likely to be negatively affected. Finally, the moderating effect could be tempered by many other factors such as audience type. Ding (2013) compared the fans and the ordinary audience in the basketball games and found that fans showed more interest in event-related activities than the ordinary audience, and the fans can get more happiness and give more support for sport events. Furthermore, Schulz et al. (2018) indicated that high interest in leisure activities could mitigate the negative relationship between the high level of leisure engagement and SWB.

In the results of the mediation effect of leisure engagement, the moderated mediation effect on support for MGP is confirmed. Similar to the results of previous studies (Chi et al., 2017; Tao & Zhang, 2016), this study finds a negative relationship between the negative impact of MGP and the supportive attitude of the audiences. A medium level (below or equal the mean) of leisure engagement can moderate the negative relationship between negative impact and SWB, thereby gaining more support for MGP from audiences. Specifically, the SWB of the audience would be reduced due to negative impact, thus reducing support for the event; but when they properly involved themselves in leisure activities, the negative effect can be reduced thus improving their SWB and potentially giving more support to the event.

5.2 Practical implications

Utilizing urban street roads as the racetrack is the unique characteristic and one of the major sources of the attractiveness of MGP, but it is also accompanied by many negative phenomena. Event planners and the government should cope with these negative impacts with discretion. Not all modern technology can overcome the problems brought by MGP. The findings of this paper can shed light for the event planners and government planners from the aspect of leisure engagement.

This study highlights that negative impact has a passive influence on the audience's SWB and their support for MGP. On the one hand, the government and organizations should take steps to prevent and reduce the negative phenomena. For instance, the government needs to monitor the soaring prices of commodities, especially vendors in the temporary shopping spots set up in the auditorium. For organizations, subjoining more facilities and resources to overcome noise and traffic problems, such as giving away more earplugs and offering more pick-up shuttle service. Specifically, instead of relying on the hotel's shuttle bus, the planner should increase more shuttle buses with different routes. Moreover, because MGP is a high-risk sport event, the government and the organizers should enhance their safety awareness. This is especially important for contestant and audience, as their personal safety seem to be affected by whether the organizer has safely taken protective precautions.

On the other hand, this result affirms that proper leisure engagement can alleviate the negative relationship between negative impact and SWB. The organizers should ensure the quality of MGP-related leisure activities rather than simply adding activities. alleviate the negative relationship between negative impact and SWB. The organizers should ensure the quality of MGP-related leisure activities rather than randomly launching irrelevant activities. On the other hand, this result affirms that proper leisure engagement can alleviate the negative relationship between negative impact and SWB. The organizers should ensure the quality of MGP-related leisure activities rather than simply adding activities. For example, holding fan meetings and racing exhibitions, providing the audience with an opportunity to visit the racing garage may elevate their happiness to a greater extent. For example, compared to holding fan meetings and racing exhibitions, providing the audience with an opportunity to visit the racing garage may increase their happiness even more. Also, social media has become an important leisure tool, and organizers should use the media platform flexibly. To be specific, the organizers can launch more amusing topics on social media to make it easier for online and offline audiences to communicate. Last but not least, the organizer needs to pay close attention to the quality of MGP-related leisure activities so that audiences can easily participate in leisure activities and get a better experience. In other words, the organizer needs to release MGP-related leisure activities on the relevant media platform or auditorium and enhance promotion. Furthermore, it is necessary to make signs of these activities at the entrance and exit of MGP, so that the audience can participate easily.

5.3. Limitations and directions for future study

This study should be considered in light of the following limitations. First, this study collected data from Macau. As a Special Administrative Region (SAR), the findings and implications of sustainable event development management may not be more widely applied to other destinations. Besides, studies show that SWB is affected by different factors. Therefore, future research can extend the current research by examining SWB of different types of audiences (e.g., fans or general audiences, local audiences and tourists) or incorporating some control variables such as gender.

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