



The Role of Leisure Centrality in University Students' Self-satisfaction and Academic Intrinsic Motivation

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Abstract The purpose of this research was to examine the role of leisure in undergraduate students' education. In particular, the study investigated the relationships among leisure centrality, self-satisfaction, and academic intrinsic motivation. Using a sample drawn from university students in Singapore, this study examined a hypothesized structural model. The results showed that leisure centrality had positive effects on both self-satisfaction and intrinsic motivation, and leisure centrality had a mediated relationship with academic intrinsic motivation through self-satisfaction. The findings of this study expand the knowledge of the consequential effects of leisure centrality by observing university students.

Keywords Leisure centrality · Self-satisfaction · Academic intrinsic motivation · Leisure education · University students

Introduction

Managing leisure has emerged as an essential topic for academic professionals as well as management practitioners. Leisure is characterized as the participation in any activity during one's free time (Pressman et al. 2009) and has evolved over the years to be recognized as a critical

element in an individual's well-being (Newman et al. 2014). Previous studies also found that employees who are entitled to leisure benefits have better psychological well-being and coping skills when dealing with stress (Coleman 1993; Coleman and Iso-Ahola 1993; Gilbert and Abdullah 2004; Lin et al. 2013). As a result, the satisfaction in fulfilling their leisure participation increases the level of employees' job performance (Wong and Lin 2007), whereas individuals who have little or no time in leisure involvement show lower job performance (Binnewies et al. 2010; Sonnentag 2012; Sonnentag et al. 2010).

Besides working adults, leisure is also vital in the context of the academic environment. Students with a leisure-oriented lifestyle tend to be less stressed, while students experiencing high levels of stress and burnout display unhappiness (Kimball and Freysinger 2003). As such, the role of leisure provides various psychological benefits for students. For example, Takeda et al. (2015) found that participating in leisure activities, such as exercise or sports, had a positive impact on students' mental health. Furthermore, they found that participating in leisure activities with friends or family members helped improve social relationships and the mental health of individuals. These findings implied leisure serves as a platform for developing friendships and social relations.

However, not all types of leisure participation contribute to enhancing students' education-related outcomes. That is, active leisure and passive leisure have different consequences. Active leisure refers to leisure activities that involve effort, physical movement that causes a temporary relief from a stressful situation in the present and restores the balance between the mind and body (Edwards 2006; Sonnentag 2001). Unlike active leisure, passive leisure requires little effort and does not have an impact on individuals' well-being such as watching the television (Argyle

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1987; Joudrey and Wallace 2009). For example, Holder et al. (2009) examined these two types of leisure and found active leisure to positively affect children's well-being by demonstrating the benefits of it on positive self-concept and happiness.

In the context of education, previous studies also found positive influences of participating in leisure activities on students' education, such as relieving academic stress (Iso-Ahola and Mannell 2004; Iwasaki and Mannell 1999; Misra and McKean 2000), reducing absenteeism (Bailey et al. 2009; Barnett 2007; Miller et al. 2005), developing time management skills (Forrester 2014), and improving academic performance (Bailey et al. 2009; Field et al. 2001). For example, passive leisure, such as smartphones (Samaha and Hawi 2016) and video games (Brunborg et al. 2014), causes addiction and is negatively associated with academic achievement. On the contrary, it was found that active leisure (e.g., physical activities) was positively associated with academic achievement (Ruiz et al. 2010). For instance, Fox et al. (2010) examined the effects of middle and high school students' participation in physical activity and sport team on their grade point average (GPA) and found that participation in physical activities had a positive influence on their GPA although there were different results among high school and middle school students. This suggests that the participation in active leisure is essential for students' academic performance.

Although previous studies showed how leisure participation positively affected students' education-related outcomes (e.g., Wilson et al. 2010), the role of leisure centrality and its relationship with students' education-related outcomes has not been fully explained despite its importance. Leisure centrality can be defined as the centrality of leisure activities within an individual's life (Kyle et al. 2003). Individuals are highly likely to organize their life around leisure activities when leisure grows to be important. As such, it can be considered as one's mindset that is a critical factor in one's life, as it can influence individuals' behavioral and psychological outcomes (Kyle and Mowen 2005). Moreover, in the field of education, academic intrinsic motivation has been considered an integral factor in achieving and maintaining successful academic performance (Linnenbrink and Pintrich 2002). Many studies have examined academic intrinsic motivation with diverse factors, such as personality (Clark and Schroth 2010), self-efficacy (Fan and Williams 2010; Niehaus et al. 2012), and academic performance (Ayub 2010; Hanus and Fox 2015). However, to date, little research exists on how leisure centrality is related to academic intrinsic motivation. Therefore, based on the dynamics of action theory, this study conducted an empirical study to understand the relationship between leisure centrality and intrinsic motivation.

In addition, to better understand the relationship between leisure centrality and intrinsic motivation, this study employed self-satisfaction as a mediator based on previous research (Chang and Chang 2012; Daguplo 2015; Randall and Bohnert 2009). Self-satisfaction is defined as an individual's satisfaction with his/her ideal self-concept (Theodorakis 1996; Twenge and Campbell 2008). Moreover, the feeling of self-satisfaction is known as positive self-reaction, which can further influence individuals' self-motivation beliefs (i.e., intrinsic motivation) (Zimmerman 2002). As such, exploring self-satisfaction can contribute to understanding the role of leisure centrality in education and provide practical strategies to sustain intrinsic academic motivation.

Literature Review

Leisure Centrality: An Antecedent

Leisure centrality was identified as one dimension of leisure involvement (Kyle and Mowen 2005). It refers to the centrality of leisure activities within an individual's lifestyle (Kyle et al. 2003). Sato et al. (2017) explained that leisure centrality is associated with the importance of leisure activity to an individual's daily life. Unlike leisure participation, which observes physical involvement, attention to leisure centrality provides an internally personal assessment of the critical role of leisure in an individual's life. Moreover, leisure centrality possesses the social aspect within it as it highlights the importance of the leisure activity to an individual's close relationships, such as friends (Chen et al. 2013). Further, leisure centrality can reflect the amount of effort and the use of acquired skills required for leisure participants to achieve serious leisure (Tsaor and Liang 2008). Kennelly et al. (2013) also pointed out that serious leisure is significantly important in participants' lives.

Bergin (1992) pointed out that leisure is related to academic achievement, as the commitment to a leisure activity inculcates discipline and problem-solving skills in students, which can be applied in the context of education. Besides the actual participation in leisure, the level of leisure centrality demonstrates the expression of different attitudes toward leisure. When the level of leisure centrality is high, it shows that individuals develop a mindset that perceives leisure to be an essential component of their lives to the extent that it pushes them to organize their life around a particular leisure activity (Kyle and Mowen 2005). Therefore, among diverse factors of leisure, leisure centrality has been chosen in the current study as it reflects one's mindset and has the potential to influence other areas

of life, which, in this case, is the intrinsic academic motivation among students.

Academic Intrinsic Motivation: A Consequence

The notion of motivation is associated with self-determination theory (SDT, Deci and Ryan 1985) explaining that motivation is multifaceted and consists of a continuum of self-determination, which ranges from amotivation to intrinsic motivation. In a similar vein, academic motivation is also based on SDT (Deci and Ryan 1985), which focuses on the relationship between motivation-related qualities and motives that regulate individuals' behavior (Utvær and Haugan 2016). In other words, SDT helps discover the motivation of students in performing school-related tasks and whether they experience more autonomous motivation or controlled motivation when performing certain behaviors.

Vallerand et al. (1992) developed an Academic Motivation Scale (AMS), subdividing intrinsic motivation into three sub-types: knowledge, accomplishment, and stimulation. In particular, intrinsic motivation for knowledge measures the degree of pleasure and satisfaction attained during participation in activities, such as the learning process. It relates to several domains, including intrinsic intellectual motivation, learning goals, and exploration (Gottfried 1985). On the other hand, intrinsic motivation for accomplishment is the evaluation of the degree of desire to participate in an activity out of pleasure and attains satisfaction from accomplishing it. This motivation drives individuals to emphasize their accomplishment. Lastly, intrinsic motivation for stimulation assesses the degree of desire to participate in the activity with the purpose of boosting a sense of self-importance and personal value (Vallerand et al. 1992).

Previous studies noted intrinsic motivation to be the most self-determined form of motivation, which means an activity done out of intrinsic motivation is to seek pleasure and satisfaction for their own sake (Jõesaar et al. 2011; Schneider and Kwan 2013). Moreover, persistence in behavior is associated with intrinsic motivation. According to Linnenbrink and Pintrich (2002), students' academic intrinsic motivation is crucial in achieving their academic goals. Shia (1998) also noted that a student possessing intrinsic motivation would foster mastery and achievement goals, such as engaging in learning and accomplishment-oriented tasks. Thus, given the importance of intrinsic motivation, this study adopts the three dimensions of academic intrinsic motivation.

Self-satisfaction: A Mediator

Self-satisfaction is described as the overall satisfaction toward oneself (Theodorakis 1996; Twenge and Campbell 2008). Moreover, self-satisfaction is a form of positive self-reaction regarding one's behavior (Zimmerman 2002). According to Heller et al. (2004), self-satisfaction can be seen as an attitude from a cognitive perspective toward one's overall happiness within one's life. Similarly, Spiers and Walker (2008) noted that people feel happy when they are engaged in activities that promote a sense of satisfaction. For example, Barbieri and Sotomayor (2013) studied surfers' leisure experience and found that self-satisfaction is one of the leisure benefits that surfing experience provided. Other leisure activity participants, such as bikers in Taiwan, also showed that the perceived importance of leisure activity positively affects personal satisfaction (Lin 2008).

According to Lee et al. (2014), leisure, in general, is essential to one's self-satisfaction. The more central or essential a leisure activity is to individuals, the more self-satisfied they feel. Leisure engagement fulfils a wide range of psychological needs (Kuykendall et al. 2015) and provides individuals with a chance to acquire skills and pose challenges, consequently experiencing satisfaction (Kuykendall et al. 2018). Further, Loureiro et al. (2013) noted positive emotions, such as calmness and relaxation, driven from leisure experiences lead to satisfaction. In this study, leisure involvement is narrowed down to leisure centrality, which focuses on the individuals' perception of how centralized leisure is in their life. Huang et al. (2014) noted that leisure centrality is related to self-satisfaction. Prioritizing leisure activity, such as taekwondo, in an individual's daily life provides an avenue for personal growth and, in particular, facilitates the development of self-satisfaction (Kim et al. 2011).

Relationships Among Leisure Centrality, Self-satisfaction, and Academic Intrinsic Motivation

Leisure centrality emphasizes leisure to be constantly at the focal point of an individual's life, which implies apparent pleasure and satisfaction from it. According to the findings of previous studies, individuals actively participating in leisure are more likely to feel satisfied (Leversen et al. 2012; Sato et al. 2017; Walker et al. 2011). In other words, when individuals engage in particular leisure activities that are important to them, a sense of self-satisfaction is developed in their participation in leisure activities. Self-satisfaction is also closely associated with intrinsic motivation. The self-determination theory (Deci and Ryan 1985) illustrates that individuals move through the continuum model of motivation toward intrinsic motivation

when they start doing activities to gain pleasure and personal satisfaction instead of extrinsic benefits. Similarly, past findings reported that the concept of satisfaction is strongly related to intrinsic motivation (Jöesaar et al. 2011; Standage et al. 2005). For example, Schneider and Kwan (2013) noted that satisfaction is directly related to intrinsic motivation for exercising. According to Fawcett et al. (2009), individuals are intrinsically motivated only when they reach the point of self-satisfaction in the involvement of an activity. Rovai et al. (2007) also suggested that self-satisfaction was one characteristic of intrinsically motivated students. In short, these studies have revealed the importance of self-satisfaction and its close association with both leisure centrality and intrinsic motivation.

Previous research showed leisure participation could relieve academic stress (Iso-Ahola and Mannell 2004), develop time management skills (Forrester 2014), and improve academic performance (Bailey et al. 2009). That is, it indicates the positive effects of leisure on students' education-related outcomes. Thus, although no research examined the relationship between leisure centrality and academic intrinsic motivation, this study hypothesized the relationship between leisure centrality and academic intrinsic motivation based on the findings of previous studies (e.g., Bailey et al. 2009; Fox et al. 2010; Ruiz et al. 2010). This can be further explained by the dynamics of action theory (Atkinson and Birch 1970). According to the dynamics of action theory (Atkinson and Birch 1970), the change of activity to another displays the strength of motivation being altered. The involvement in one activity can influence the motivation in an alternative activity (Lens et al. 2005). In other words, leisure centrality in a student's life is capable of influencing their academic motivation. Furthermore, the importance placed on leisure brings psychological benefits, such as self-satisfaction. Therefore, based on the findings of previous studies, this study takes a unique approach not only to strengthen this relationship but also posit that this relationship influences other activities in individuals' lives; the following hypotheses are postulated:

H1 Leisure centrality has a positive effect on self-satisfaction.

H2 Leisure centrality has a positive effect on academic intrinsic motivation.

H3 Self-satisfaction has a positive effect on academic intrinsic motivation.

H4 Self-satisfaction positively mediates the relationship between leisure centrality and academic intrinsic motivation.

Method

Study Sites and Data Collection

It has been identified that Singaporean students generally revealed higher levels of anxiety regarding academic performance compared to other OECD countries (Davie 2017). Moreover, Singaporean university students' learning behavior is primarily determined by external factors, such as the educational incentive, assessment, and competition (Amin et al. 2009). As such, it is critical to understand how other possible factors (i.e., leisure centrality and self-satisfaction) affect their intrinsic motivation to perform academic activities.

This study mainly collected data from university students at one of the largest universities in western Singapore. In addition, several students from two other universities in Singapore were also invited to participate in the survey. Questionnaires were printed and distributed onsite, and a total of 301 surveys were collected. Specifically, two research assistants visited universities and randomly selected research participants and asked them to participate in the survey. After obtaining their informed consent, they were briefed about the procedures of the survey and proceeded to the commencement of the survey. Data were collected from January 2018 to February 2018, and the approval of this study was granted by the Institutional Review Board (IRB) at the university where the first author was affiliated. From the results of data screening, extreme outliers were deleted based on the Mahalanobis distance, and missing values were also treated using the Expectation–Maximization (EM) algorithm. Of the total 301 responses, 297 surveys were employed in further analyses. The average age was 22.73, and most of the respondents were single (98.3%, $n = 292$). Males comprised 55.6% ($n = 165$) and females 44.4% ($n = 132$) of the sample. 87.5% ($n = 260$) of the respondents were Chinese, followed by Malay (7.1%, $n = 21$), Indian (3.7%, $n = 11$), and others (1.7%, $n = 5$). As for the gross household income, 25.9% ($n = 77$) of the respondents with \$5000–\$7900 reported the highest followed by \$2000–\$4999 (25.6%, $n = 76$), \$000–\$9999 (15.8%, $n = 47$), \$15,000 or over (11.8%, $n = 35$), under \$2000 (11.1%, $n = 33$), and \$10,000–\$14,999 (9.8%, $n = 29$).

Survey Instrument

The survey instrument comprised four sections, including leisure centrality, self-satisfaction, academic motivation, and demographic information. First, in this study, we mainly focused on active leisure. Thus, before research participants start the survey, we used the statement (i.e.,

“Leisure can be defined as preferred physical activities pursued during free time for their own sake, fun, or self-improvement, including swimming, walking, running, playing soccer, playing basketball, playing badminton, and weightlifting”) and explained the concept of leisure to avoid the confusion. The scale of leisure centrality was borrowed from Jun et al.’s (2012) study to measure individuals’ centrality of leisure activities in their lives. There are two items; an example item is “I find a lot of my life is organized around my leisure activity.” Next, a four-item scale of self-satisfaction (Huebner 1994; Huebner et al. 1998) was used to measure students’ evaluation of themselves. An example item includes “I like myself.” Third, a three-factor scale of academic intrinsic motivation was taken from Utvær and Haugan (2016). This scale measures students’ internal desire to perform academic activities and consists of three factors, including Intrinsic Motivation for Knowledge (IMK, four items), Intrinsic Motivation toward Accomplishment (IMA, four items), and Intrinsic Motivation for experience Stimulation (IMS, four items). Sample items include “I experience pleasure and satisfaction while learning new things” (IMK), “I experience pleasure while surpassing myself in my studies” (IMA), and “I really like going to school” (IMS). All items were evaluated using 7-point Likert scales, ranging from 1-strongly disagree to 7-strongly agree. In addition, demographic information included gender, age, ethnicity, marital status, and gross household income.

Data Analysis

This study used Mardia’s (1985) multivariate kurtosis coefficient to test the normality of the data. The result showed non-normality (i.e., Mardia’s standardized coefficient was 28.76). Thus, in this study, Satorra–Bentler scaled Chi-square (S–B χ^2 , Satorra and Bentler 1994) and robust standard errors (Bentler and Dijkstra 1985) were employed. This study performed confirmatory factor analysis (CFA) and identified model fit indices. Then, this study examined the internal consistency of the measurement using Rho coefficients. Further, the convergent and discriminant validity were evaluated using Average Variance Extracted (AVE) values and inter-construct correlations (Fornell and Larcker 1981). After verifying the reliability and validity of the measurement model, this study examined the four hypotheses by conducting structural equation modeling (SEM) analysis. In the research model, as self-satisfaction mediates the relationship between leisure centrality and academic intrinsic motivation, this study examined indirect effect using Monte Carlo simulation (Preacher and Selig 2012).

Results

Measurement Model

According to the result of the initial CFA, the model fit indices were not acceptable: S–B $\chi^2(df) = 424.48(124)$, comparative fit index (CFI) = 0.875, and root mean square error of approximation (RMSEA) = 0.090 (90% CI 0.081–0.100). This study found that two items (i.e., one item from self-satisfaction and one item from IMK) that showed low factor loading (< 0.5) were removed, as they were detrimental to the convergent validity of the scale (AVE < 0.5). After eliminating these five items, the modified model revealed acceptable model fit indices: S–B $\chi^2(df) = 271.20(94)$, CFI = 0.919, and RMSEA = 0.080 (90% CI: 0.069–0.091). Next, Rho coefficients of each factor were 0.880 for leisure centrality, 0.788 for self-satisfaction, 0.903 for IMK, 0.869 for IMA, and 0.831 for IMS (Table 1). The convergent validity was assessed using the AVE values of five factors. According to the result, the AVE values ranged from 0.555 for self-satisfaction to 0.799 for leisure centrality, indicating acceptable convergent validity. Last, to evaluate the discriminant validity of the measurement model, the square root of AVEs and each inter-construct correlation were compared. The result revealed that the square roots of AVEs were greater than each inter-construct correlation, indicating acceptable discriminant validity (Table 2).

Structural Model

This study tested the relationships among leisure centrality, self-satisfaction, and academic intrinsic motivation. The results of the SEM showed that the model fit indices were acceptable: S–B $\chi^2(df) = 282.14(97)$, CFI = 0.916, and RMSEA = 0.080 (90% CI 0.068–0.090). Next, an examination of the z statistic was conducted to test the hypotheses. First, leisure centrality had a positive effect on self-satisfaction ($\beta = 0.406$, $SE = 0.049$, $z = 5.717$, $p < 0.01$), and self-satisfaction significantly influenced academic intrinsic motivation ($\beta = 0.387$, $SE = 0.083$, $z = 4.67$, $p < 0.001$). However, the standardized path coefficient from leisure centrality to academic intrinsic motivation was not significant ($\beta = 0.050$, $SE = 0.051$, $z = 0.678$, $p > 0.05$). This study further tested the indirect effects of the mediation model and found that leisure centrality had an indirect effect on academic intrinsic motivation through self-satisfaction ($\beta = 0.109$, $SE = 0.029$, Monte Carlo confidence intervals = [0.028, 0.223], $p < 0.001$), indicating full mediation. In addition, this study examined the relationships between leisure centrality and each subfactor of academic intrinsic motivation. From

Table 1 Factor loading (λ), Rho, and AVE of the measurement model

Factors and items	λ	Rho	AVE
Leisure centrality		0.880	0.799
I find a lot of my life is organized around my leisure activity	0.898		
Leisure activity occupies a central role in my life	0.890		
Self-satisfaction		0.788	0.555
Most people like me	0.818		
There are lots of things I can do well	0.753		
I like myself	0.656		
Intrinsic academic motivation			
Intrinsic Motivation for Knowledge (IMK)		0.903	0.756
I experience pleasure and satisfaction while learning new things	0.842		
I experience pleasure when I discover new things never seen before	0.928		
I experience pleasure in broadening my knowledge about subjects which appeal to me	0.835		
Intrinsic Motivation toward Accomplishment (IMA)		0.869	0.626
I experience pleasure while surpassing myself in my studies	0.850		
I experience pleasure while I am surpassing myself in one of my personal accomplishments	0.795		
I feel satisfied when I am in the process of accomplishing difficult academic activities	0.821		
University allows me to experience personal satisfaction in my quest for excellence in my studies	0.690		
Intrinsic Motivation for experience Stimulation (IMS)		0.831	0.569
I really like going to school	0.943		
School is fun for me	0.916		
I experience pleasure when I am taken by discussions with interesting teachers	0.537		
I experience that 'high' feeling while reading about various interesting subjects	0.510		

Table 2 Correlations among all factors

	(1)	(2)	(3)	(4)	(5)
(1) Leisure centrality	0.894 ^a				
(2) Self-satisfaction	0.408	0.745 ^a			
(3) Intrinsic motivation for knowledge	0.206	0.301	0.869 ^a		
(4) Intrinsic motivation toward accomplishment	0.127	0.322	0.665	0.791 ^a	
(5) Intrinsic motivation for experience stimulation	0.177	0.401	0.330	0.552	0.754 ^a

^aSquare root of AVE

the results of three-path mediation analyses, leisure centrality had a positive effect on IMK ($\beta = 0.733$, $SE = 0.022$, $p < 0.001$), IMA ($\beta = 0.162$, $SE = 0.049$, $p < 0.001$), and IMS ($\beta = 0.096$, $SE = 0.029$, $p < 0.001$) (Table 3).

Discussion

The purpose of this study was to examine university students' leisure centrality and its impact on their drive (i.e., academic intrinsic motivation) and how satisfied they are with themselves (i.e., self-satisfaction). According to the results, leisure centrality had positive effects on both self-satisfaction and intrinsic motivation, while intrinsic

motivation played a mediating role in the relationship. The findings of this study expand the knowledge of the consequential effects of leisure centrality by observing university students, and it provides theoretical and empirical evidence on the relationship between leisure and education.

First, it was found that leisure centrality has a positive relationship with self-satisfaction. This finding is in line with the argument of previous studies, although no previous studies emphasized the perception of individuals' leisure centrality. For example, Kuykendall et al. (2015) noted the consequence of leisure involvement to be the fulfilment of psychological needs, resulting in a higher level of satisfaction. Likewise, Lee et al. (2014) outlined that the degree of centrality or importance placed on leisure in an individual's life corresponds to the level of self-

satisfaction experienced. Students' leisure involvement was observed to yield both short-term and long-term benefits, such as happiness, social integration, better organizational skills, and time management (Lu and Hu 2005). In particular, Hills et al. (2000) found that adolescents' leisure involvement showed a positive relationship with their personal satisfaction. In other words, the more central and essential leisure was to the adolescents, the stronger their self-satisfaction was.

Another finding of this study was that self-satisfaction has a positive effect on individuals' academic motivation. In line with this, Rovai et al. (2007) provided substantial evidence by outlining the importance of teachers' focus on facilitating personal satisfaction in students in order for them to be intrinsically motivated. Similarly, Shroff et al. (2008) suggested, when students become recipients of positive feedback, such as in the form of praise for an activity, their self-satisfaction increases, causing them to be intrinsically motivated to do better in that particular activity. Agreeing with this, Shroff and Vogel (2009) found that students should be presented with events that offer positive feedback that result in increased personal satisfaction in order to increase their learning/academic achievements. Likewise, the findings of this study put forth that leisure centrality can serve as positive feedback in providing students with self-satisfaction. The self-satisfaction gained would increase their intrinsic motivation toward academic achievements.

Moreover, this study found that self-satisfaction played a mediating role in the relationship between leisure centrality and academic intrinsic motivation. In particular, leisure centrality is an important focal point of leisure measurement, as it provides an avenue for new findings. Given that active participation in leisure generates extensive psychological benefits (Newman et al. 2014), individuals giving importance to active participation in leisure may more easily attain the benefits, such as self-satisfaction. In addition, leisure centrality reflects individuals'

perception of the activity to be one that provides life benefits, and this may include stress reduction and self-satisfaction (Wiley et al. 2000).

In addition, the self-satisfaction produced by an individual's leisure centrality allows them to gain intrinsic motivation. Generally, the continuum of motivation stipulates that individuals move to attain intrinsic motivation when they are doing an activity for their personal satisfaction rather than materialistic rewards (Deci and Ryan 1985). Fawcett et al. (2009) outlined that repetitive practice in activities has to reach a stage where it starts to become self-satisfying for the individuals. Similarly, this study put forth the notion that leisure centrality in an individual's life indicates the everyday involvement and practice in it. The unique feature of these findings was that it extended this notion by explaining that the intrinsic motivation generated by leisure centrality affects individuals' motivation in other activities that, in this case, includes their academic motivation. Supporting this, the dynamics of action theory helps to explain how the motivation yielded by leisure is capable of affecting motivation toward students' academia. According to the dynamics of action theory (Atkinson and Birch 1970), the strength of behavior or motivation lies in the change from one particular activity to another. In other words, students' motivation to study is indirectly dependent on their involvement and interest in other tasks, such as leisure activities and relaxing.

According to Deci and Ryan's (1985) self-determination theory, intrinsically motivated individuals are characterized as individuals with an internal locus of control, who are enthusiastic about gaining knowledge, focused on accomplishment, and pursue intellectual stimulation. Past studies have established the importance of the three sub-factors that make up intrinsic motivation as three distinct types in the realm of education (Cetin 2015; Cokley et al. 2001; Önder et al. 2014). Other studies have attempted to study the different factors that influence students' intrinsic motivation. Likewise, the findings of this study took a new

Table 3 Results of regression and mediation analyses in the structural model

Path	β	SE	<i>p</i> -value
Path 1 (H1): Leisure centrality → Academic motivation	0.050	0.051	<i>p</i> > 0.05
Path 2 (H2): Leisure centrality → Self-satisfaction	0.406	0.049	<i>p</i> < 0.001
Path 3 (H3): Self-satisfaction → Academic motivation	0.387	0.083	<i>p</i> < 0.001
Path 4 (H4): Leisure centrality → Self-satisfaction → Academic motivation	0.109	0.029	<i>p</i> < 0.001
Three-path mediation analyses			
Leisure centrality → Self-satisfaction → Academic motivation → Knowledge	0.733	0.022	<i>p</i> < 0.001
Leisure centrality → Self-satisfaction → Academic motivation → Achievement	0.162	0.049	<i>p</i> < 0.001
Leisure centrality → Self-satisfaction → Academic motivation → Simulation	0.096	0.029	<i>p</i> < 0.001

IV independent variable, *DV* dependent variable, *MV* mediating variable

approach in acknowledging the role of leisure in students' intrinsic motivation. This study hypothesized that intrinsic motivation is influenced by leisure centrality, and this intrinsic motivation was channeled into the three distinct types in academic motivation.

The first subdomain of academic motivation, intrinsic motivation to knowledge, considers students' curiosity for the need to know and understand new things. Saeed and Zyniger (2012) found that it was important for the education system, specifically teachers, to be curating activities according to students' motivation. In accordance with that, students who were intrinsically motivated were keen to learn new things. In line with this, Taylor et al. (2014) conducted a longitudinal study and found intrinsic motivation to know is significant in school achievement. Therefore, students that are motivated to study because they take pleasure in acquiring new knowledge and thrive in accomplishments are likely to do better in terms of their academic progress.

Second, intrinsic motivation to accomplish identifies students' who give their attention to completing a task instead of the outcome. Studies have touched on this notion by considering this as mastery motivation is also characterized by persistence in completing challenging tasks (Harter 1981; Haynes et al. 2008). In a similar vein, Beggs et al. (2004) found that college students who possess a high level of intrinsic motivation to participate in recreational sports on campus were motivated to compete and master skills and challenge-oriented tasks (Fig. 1).

The last academic intrinsic motivation is stimulation. A student who is intrinsically motivated to experience stimulation may attend classes to seek the excitement that comes from a discussion or debate. In line with this, Spittle et al. (2009) attempted to understand the motivation to become a physical education teacher and found intrinsic motivation to experience stimulation to be one intrinsic motivation type influencing professional performance (Spittle et al. 2009). Similarly, the intrinsic motivation gained from high leisure

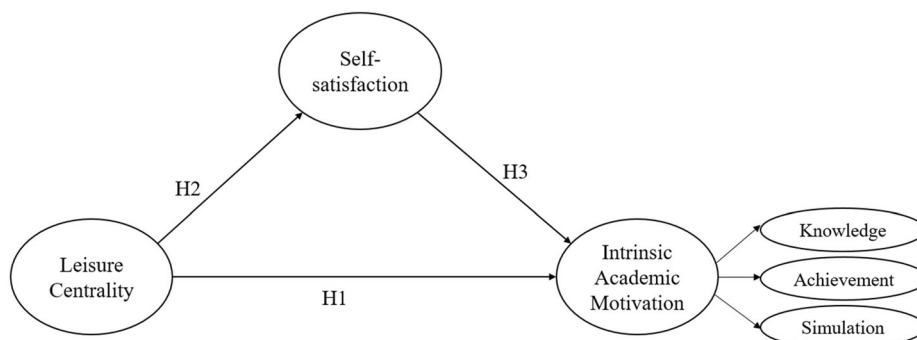
centrality in a student's life causes them to redirect this motivation toward academic stimulation.

Leisure centrality was distinguished as one factor under leisure involvement (Kyle and Mowen 2005) that demonstrated to be a psychological determinant of one's perception of leisure by taking into account the importance of leisure to one's identity. The results of this study put forth the notion that leisure centrality positively affects intrinsic academic motivation. Based on the dynamics of action theory (Atkinson and Birch 1970), it can be explained that involvement in one activity enables motivation in another activity to be altered. This psychological involvement presets the attitude not only towards their leisure activity but also towards other activities (e.g., education). As such, students that hold leisure in an important position can be motivated to ensure their academic tasks are well planned; this mentality translates into the academic intrinsic motivation that could enhance academic achievement. Although no study has directly measured the relationship between leisure centrality and each subfactor of intrinsic motivation, the current study provides empirical evidence in supporting that leisure centrality in students plays an essential role in strengthening intrinsic academic motivation. This finding provides implications that may be useful in understanding the determinants of intrinsic academic motivation among students and allowing school management to implement appropriate strategies for students.

Implications

The findings of this study play a pivotal role in the theoretical advancements in the field of leisure and education. According to the existing body of literature, there has been scant research to understand the impact of leisure on academic motivation in the context of education. Hence, by establishing a connection between two fields of study, leisure, and education, this study is considered an interdisciplinary study linking leisure and education.

Fig. 1 A hypothesized model



H4: Three-path mediation
 (Leisure centrality → Self-satisfaction → Intrinsic academic motivation → Knowledge/Achievement/Simulation)

Additionally, the application of AMS has proven its usefulness in explaining the relationship between leisure and academic motivation among university students. Not only has this study shed light upon the relationship, but it extended its evidence by highlighting the importance of the outcome variables that, in this case, were the different types of intrinsic motivation of the AMS. Furthermore, the findings of this study imply that the more central leisure is to individuals, the higher the level of self-satisfaction experienced. In accordance with this positive assessment, leisure serves as a tool for motivating students to be more enthusiastic about their academics.

The significant relationships among the three constructs have practical implications. The key findings suggest that interventions can be developed, targeting an increase in motivation among students. When importance is placed on leisure centrality, students experience a high level of self-satisfaction, consequently increasing their academic intrinsic motivation. As such, governing bodies and school management should implement a variety of leisure-related activities in education. Particular attention to choosing those leisure-related activities is necessary as a fair amount of activities that correlate with the types of academic motivation outlined by the AMS should be chosen. Based on the dynamics of action theory (Atkinson and Birch 1970), the reason for stressing leisure-related activities would be to add the enjoyment factor in a student's academic life. The enjoyment felt through leisure not only becomes a buffer for the pressure felt while studying but with the positive energy gained, it acts as a motivator to increase their enthusiasm when they return to studying. The balance between leisure and academia in a student's life ensures a high level of self-satisfaction, resulting in high quality of life.

Limitation and Future Research

There are limitations to this study; therefore, future research can take into consideration that this study has contributed to work in the leisure literature. First, one limitation is that this research only used two items to measure leisure centrality. Although the psychometric properties of the scale have been tested in previous research (Jun et al. 2012), two items may not be enough to accurately explain the concept of leisure centrality. Hence, with the development of more items in leisure centrality, future research can provide more comprehensive understanding on the role of leisure centrality. Next, this study considers leisure activities in general; the future study can take a range of specific types of leisure activities into consideration to determine its effect and motives more precisely. In addition, other factors, such as social support and academic self-efficacy, can be included in future

research in order to determine its effects. For example, students may feel satisfied by leisure when they have peers who share the same desire, and thus they would pursue and engage in the same type of leisure activity together as compared to a student without a social cohort. Further, future studies may look into societal ideologies, such as gender appropriateness of particular leisure activities and individual interests, and their effects on leisure. It can be further extended to the social context of individuals' lives, broader societal structures, and cultures as these variables may affect their leisure as well as personal relevance associated with it. Next, the data of this study were primarily collected from one university in Singapore. Thus, future studies should collect data from a broader population. It would be useful to verify, assess, and determine the external validity of the relationship among the constructs. In addition, besides using the quantitative approach, a qualitative study or longitudinal study is necessary to provide new findings. In conclusion, the model constructs and the structural relationships among leisure centrality, self-satisfaction, and intrinsic motivation conducted in this study were used to understand student's motivation for learning. Individuals engaging in leisure activities significant to them may find satisfaction in them and become motivated to achieve their desired outcomes.

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