Soc Indic Res (2008) 86:163–175
DOI 10.1007/s11205-007-9101-y

The relationship between leisure and life satisfaction: application of activity and need theory

Ariel Rodríguez · Pavlína Látková · Ya-Yen Sun

Received: 8 February 2007 / Accepted: 24 February 2007 / Published online: 23 March 2007

Abstract The purpose of this study was to better understand the complex relationship between leisure and life satisfaction. Components of two distinct, but potentially integrative, theoretical frameworks (i.e., activity theory and need theory) predicting the relationship between leisure and life satisfaction were tested with a sample of residents from a Midwestern community (n = 633). Findings provided support for both theoretical perspectives, but stronger relationships were found between satisfied needs than with participated activities. In spite of these findings, the various inconsistencies within the two theoretical frameworks suggest that future research is needed.

Keywords Leisure · Activity theory · Need theory · Life satisfaction

1 Introduction

The purpose of much quality of life research has been to predict or explain how some individuals or groups of individuals have higher levels of quality of life than others. It is often felt that if the *how* of quality of life could be determined, researchers and

A. Rodríguez (✉)
Tourism, Recreation, and Sport Management, University of Florida, P.O. Box 118208, Gainesville, FL 32611–8208, USA
e-mail: arodrig@hhp.ufl.edu

P. Látková
Department of Community, Agriculture, Recreation & Resource Studies (CARRS), Michigan State University, 131 Natural Resources Bldg, East Lansing, MI 48824–1222, USA
e-mail: latkovap@msu.edu

Y.-Y. Sun
Department of Kinesiology, Health, and Leisure Studies, National University of Kaohsiung, No. 700, Kaohsiung University Rd., Nan Tzu Dist., 811, Kaohsiung, Taiwan
e-mail: yysun@nuk.edu.tw

practitioners could then use this information to develop programs or other initiatives which could benefit those who may have lower levels of quality of life. To this end, research has been conducted focusing on components of quality of life, often operationalized in an objective or subjective manner.

Research focusing on the subjective component of quality of life has focused on subjective wellbeing, human development, and constructs which influence or correlate with subjective wellbeing or human development (Vittersø 2003). Subjective wellbeing includes four independent constructs: positive affect, negative affect, overall life satisfaction, and salient domains of life (Diener 2000; Diener et al. 1999). Of these four constructs, this study will focus on the overall life satisfaction of individuals.

Overall life satisfaction, or simply life satisfaction, has been defined as the global judgment of a person's life (Diener 1984; Pavot and Diener 1993). This judgment is individualistic and is often based on a person's self-imposed standards and the degree to which standards are satisfied (Pavot and Diener 1993). Individuals who are able to decrease the gap between their current situation and where they wish to be often indicate higher life satisfaction (Pavot and Diener 1993).

So who has a higher life satisfaction? This question has been pursued in many research studies. Overall, it has been found that knowing one's gender, age, race and even income does not necessarily translate to understanding how satisfied a person is with their life. Moreover, the questions that have been pursued have often focused on a bottom-up approach, an approach which presumes that life satisfaction occurs to individuals (i.e., a person can increase their life satisfaction). This is in direct contrast to top-down approaches which emphasize a person's traits (e.g., intrinsic, neurotic, or extrinsic) influences whether or not they perceive their life satisfaction in a positive or negative manner. In other words, the life situation of a person does not necessarily influence a person's life satisfaction (i.e., a person cannot increase their life satisfaction). Although both top-down and bottom-up have since been found to both contribute to our understanding of life satisfaction, it was through rigorous research efforts grounded in more solid theoretical frameworks that contributed to our understanding of the bottom-up approach (Diener et al. 1999; Myers and Diener 1995).

One of these efforts focused on the different components of subjective wellbeing, specifically, life domains. As noted by Cummins (1996), ''The possible number of domains is large. If each term describing some aspect of the human condition is regarded as separate, then their number is very large indeed'' (p. 304). Cummins' research efforts, along with the efforts of other researchers, have led to a narrower list of what are considered salient life domains. Of these, a common domain often discussed is leisure (Sirgy et al. 2006).

Recent literature indicates that although leisure may be an important indicator of subjective wellbeing and quality of life, there is very little understanding as to how this occurs (Baker and Palmer 2006; Iwasaki 2006). One of the more common theoretical frameworks used in understanding this relationship has been Havighurst's (1961) activity theory which was later refined by Lemon et al. (1972) and Longino and Kart (1982). Activity theory suggests a positive relationship between activity and life satisfaction. According to the activity theory, the greater the frequency and intimacy of activity, the greater the life satisfaction. Despite receiving some empirical support for the theoretical framework, researchers have recently begun to question whether activity theory sufficiently explains life satisfaction (Burnett-Wolle and Godbey 2005). Lack of consistent empirical evidence to support activity theory, inconsistency in activity measures (Menec 2003), and failure to explain reasons associated with participation in specific activities

(Everard 1999) suggests that other theoretical frameworks may be more successful in explaining life satisfaction. Therefore, the first purpose of this research study is to analyze specific recreation activities in relation to life satisfaction. By not aggregating activities, as is common in many studies which analyze recreation activities, the researchers will be able to analyze how much participation in each recreation activity contributes to our prediction of life satisfaction.

An alternative theoretical framework from which to view the relationship between leisure and life satisfaction is a need theory framework. Need theory refers to theoretical frameworks which purport that when individuals satisfy their needs, this in turn has a salutary effect on their subjective wellbeing (Diener and Lucas 2000). For instance, when an individual satisfies their need for autonomy, such as might occur as an outcome of choosing a recreation activity one wishes to participate in, this may positively influence a person's life satisfaction. Similar to activity theory, need theory has received empirical support. For example, the empirical work of Deci and Ryan regarding their self-determination theory has promoted the understanding of three human needs (i.e., competence, autonomy, and relatedness) in their quest to better understand human behavior and well-being (Deci and Ryan 2000; Ryan and Deci 2000). Additional research by Driver and his colleagues and Tinsley and his associates has greatly advanced our knowledge of human needs associated with leisure endeavors (Driver et al. 1991; Tinsley and Eldredge 1995). Therefore, the second purpose of this research study is to analyze whether need theory is more appropriate to understanding the relationship between leisure and life satisfaction than activity theory. More specifically, this study will focus on needs often associated with being fulfilled during leisure experiences as noted by the work of Driver and Tinley. To date, the researchers of this study are not aware of other studies which have tested activity theory and need theory as competing theories.

1.1 Activity and need theory

1.1.1 Activity theory

Activity theory suggests both the frequency of participation and the degree of intimacy associated with the activity influence life satisfaction. The greater the frequency and the more intimate the activity, the greater the life satisfaction (Lemon et al. 1972). Based on the degree of intimacy, distinction can be made among formal, informal, and solitary activities in terms of their effect on life satisfaction and health (Longino and Kart 1982). Informal social activities are proposed to be highly related to life satisfaction, while formal and solitary activities are related to life satisfaction in a smaller extent (Lemon et al. 1972). While the activity frequency component has been generally supported by researchers, studies have shown inconsistencies regarding the importance of activity's intimacy (Menec 2003).

Participation in activities is often considered positively related to life satisfaction (Lloyd and Auld 2002). Previous research has shown a positive relationship between life satisfaction and participation in physical leisure activities such as sports and exercise (Leung and Lee 2005; Melin et al. 2003; Schnohr et al. 2005; Wankel and Berger 1990). For example, a study of a random sample of 18–64 year old Swedish residents (n = 2,533) indicated respondents who had participated in sports/exercise reported higher levels of life satisfaction as opposed to the physically non-active respondents (Melin et al. 2003). In addition to place-centered leisure activities, people-centered leisure activities (e.g., talking

with friends and family and participation in community or religious activities) have also been found to be significantly related to quality of life (Leung and Lee 2005; Lloyd and Auld 2002). Physical and leisure activities (Menec 2003), exercising (Menec and Chipperfield 1997), and participation in activities in general (Fernandez-Ballesteros et al. 2001) have been reported to be significant predictors of well-being among older adults. For example, Fernández-Ballesteros et al. (2001) studied contribution of socio-demographic characteristics and psychosocial factors (i.e., activity, perceived health, and physical illness) to life satisfaction among older adults. They found activity to have the most important total effect on life satisfaction ($r = .74$, $p < .001$) among psychosocial factors both directly ($r = .41$, $p < .001$), and indirectly through physical illness and perceived health.

Throughout the years, recreation activity participation researchers have made several attempts at aggregating activities into different homogeneous groups often with the purpose of simplifying data analysis. The primary dilemmas with this practice deal with (1) the techniques used to aggregate activities and (2) the difficulty of interpreting the analysis results. The most common strategy in creating classification systems is to factor analyze (confirmatory or exploratory) activity participation frequencies. The dilemma with this strategy is that participation frequencies do not provide information about the experience during the participation in these activities; they only indicate how often a person participates in an activity. Therefore, conclusions of the relationships between these classification systems and life satisfaction are difficult to interpret because individual activities have been shown to satisfy different psychological needs (Tinsley and Eldredge 1995).

1.1.2 Need theory

The psychological needs of humans have been a topic of research interest for many years (Maslow 1954; Murray 1938). At its core, need theory purports that individuals maintain or increase their wellbeing if they are able to satisfy their human needs (Diener and Lucas 2000). Many definitions of basic needs have been proposed, but a definition consistent with the scope of this study was proposed by Ryan and Deci (2000). They indicated that ''a basic need, whether it be a physiological need or a psychological need, is an energizing state that, if satisfied, conduces toward health and well-being but, if not satisfied, contributes to pathology and ill-being'' (Ryan and Deci 2000, p 74). In leisure studies, two researchers have provided most of the groundwork for our understanding of psychological needs, Driver and Tinsley (Driver et al. 1991). Each of their work spans over 30 years.

Driver and his colleagues focused much of their research on the outcomes or perceived positive benefits of participating in outdoor activities. They believed that individuals participated in various outdoor activities to fulfill needs that went unmet in other areas of an individual's life. By participating in outdoor activities, individuals could attain different positive outcomes to fulfill these needs. Tinsley and his associates focused on activities that are commonly done during individuals' daily lives (e.g., playing cards, jogging, watching television, and reading). Part of his research efforts focused on identifying psychological needs associated with leisure experiences. For a more extensive review of their work, recommended pieces include a summary chapter by Driver et al. (1991) and an article by Tinsley and Eldredge (1995).

Due to the work of researchers such as Deci, Ryan, Sheldon, and their colleagues, much is known about various needs and their relationship to different components of wellbeing, specifically, the need for autonomy. For example, individuals who have high autonomy have been found to also be high in self-esteem, positive affect, and psychological health and be less likely to be self-derogatory, experience negative emotions (e.g., shame or guilt), or experience boredom (Deci and Ryan 1995). Moreover, when compared to other psychological needs (e.g., self-esteem, self-actualization, and security), autonomy was identified as one of the most significant psychological needs (Sheldon et al. 2001).

Overall, need theory has various limitations, but one of the more critical limitations is that efforts to produce exhaustive lists of biological and psychological needs have not received much empirical support (Diener and Lucas 2000). Although efforts have been made to produce exhaustive lists of psychological needs (e.g., Sheldon et al. 2001), this limitation still exists and makes it difficult to conclude with confidence that any need theory study is actually testing the most salient needs in relation to life satisfaction and other subjective wellbeing components.

2 Research questions

The purpose of this study was to better explain the relationship between leisure and life satisfaction. Towards that end, three research questions have been posed:

1. Is participation in some recreation activities more important than others when predicting life satisfaction?
2. Is the satisfaction of some psychological needs often experienced during leisure more important when predicting life satisfaction?
3. Does activity theory or need theory better predict life satisfaction?

3 Methods

3.1 Study participants

Data were collected throughout March and April of 2005 using a modified Dillman (2000) approach. A total of 3,200 registered voters of a Midwest community were contacted, via mail, to participate in the study. A total of 633 individuals returned completed surveys (21.3% response rate when bad addresses considered). Study participants were primarily female (58.9%), 45–54 years old (28.8%), White (98.1%), and had household incomes of $100,000 and over (39.3%). Compared to the study population, the sample contained more individuals who were female and individuals who had higher household incomes (i.e., over $100,000).

3.2 Instruments

3.2.1 Activity participation

Each study participant was asked to write the number of times (frequency) they participated in a group of pre-determined activities (see Table 1 for activity items, items 7–17) during the past four weeks. The predetermined activities were based on Tinsley and Eldredge's (1995) compendium of activities. The selected activities were commonly done in households or done within facilities common to many communities. For example, most

Table 1 Correlation coefficients[a], means, standard deviations, and alpha reliability coefficients

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17
1. Life satisfaction																	
2. Physical fitness need	.33**																
3. Social need	.40**	.45**															
4. Autonomy need	.40**	.46**	.51**														
5. Family togetherness need	.37**	.36**	.54**	.45**													
6. Skill development need	.35**	.48**	.47**	.60**	.39**												
7. Attending plays	.01	−.07	.11*	.02	.08	.01											
8. Baking/cooking	.04	.03	.06	.08	.07	.07	.06										
9. Cards	.03	.02	.03	.03	.13**	−.01	.14*	.21**									
10. Computer games	−.14**	−.13**	−.06	−.03	.04	−.05	.01	.10	.27**								
11. Going to the movies	.04	.02	.04	.01	.05	−.02	.17**	.03	.23**	.11*							
12. Photography	.08	.06	.07	.11*	.08	.09	.12**	.22**	.12*	.08	.09						
13. Visiting friends/relatives	.09*	.06	.14**	.08	.15**	.08	.05	.20**	.16**	.01	.12**	.15**					
14. Attending religious/spiritual facility	.04	−.01	.10*	−.01	.11*	.01	.18**	.09	.11*	−.06	.13**	.11*	.17**				
15. Jogging/walking for exercise	.26**	.44**	.17**	.15**	.13**	.22**	.07	.18**	.08	.04	.09	.15**	.20**	.07			
16. Swimming	.09	.03	−.05	.00	.05	−.02	.04	.02	.08	.03	.07	.14**	−.01	.13**	.13*		
17. Weight lifting	.13**	.36**	.04	.09	−.04	.04	.04	.08	.07	−.02	.18**	.04	.02	−.03	.30**	.06	
Means	20.7	4.6	5.1	5.4	5.6	5.0	.3	15.5	1.5	4.5	1.1	2.9	7.1	3.2	9.6	0.9	3.4
Standard deviations (SD)	5.1	1.5	1.1	1.1	1.3	1.3	0.6	13.5	2.9	7.4	1.2	5.1	5.7	3.2	8.5	2.8	5.5
Alpha reliability coefficient	.92	.90	.89	.78	b	b	b	b	b	b	b	b	b	b	b	b	b

[a] Spearman's ρ

[b] No alpha reliability coefficient as single-item measures were used

* $p < .05$

** $p < 01$

Item 1: the score is the summation of five 7-point Likert scales

Items 2–6: the score is based on a 7-point Likert scale

Items 7–17: refer to frequency of activity participation in the past 4-weeks

communities in the US have religious/spiritual facilities. Moreover, the various activities were found to have different psychological outcomes (Tinsley and Eldredge 1995). The participation rates of each activity ranged from a mean high of cooking/baking 15.5 times a month to attending plays less than once a month. Reliability of items was not possible given the use of single-item indicators for each activity.

3.2.2 Needs

A modified subscale of the Recreation Experience Preference Scales (REP) (items 2–6) (Driver et al. 1991; Manfredo et al. 1996) was used to measure study participants' level of satisfaction with five needs: need to do things with one's family (family togetherness), need to develop skills and abilities (skills development), need to be physically active (physical fitness), need to be around others similar people (social), and the need to be autonomous (autonomy). The REP was originally used to analyze the importance individuals place on leisure specific outcomes. The instrument was modified to measure levels of satisfaction as opposed to levels of importance. Three need constructs (i.e., autonomy, social, and physical fitness) were measured using three items on a seven-point Likert scale (1 = completely dissatisfied; 7 = completely satisfied). The other two need constructs (family togetherness and skills development) were measured using single item measures also on a seven-point Likert scale (1 = completely dissatisfied; 7 = completely satisfied). The REP has shown to have Cronbach alphas of over 0.75 (Driver et al. 1991), indicating good internal consistency, and it has been found to have both concurrent validity (Tinsley et al. 1982) and construct validity (Rosenthal et al. 1982). In this study, the internal consistency of the items for physical fitness, social, and autonomy needs, analyzed using Cronbach's alpha (1951), was acceptable (α = .90, .89, .78 respectively).

3.2.3 Life satisfaction

The Satisfaction with Life Scale (Diener et al. 1985) was used to measure life satisfaction of study participants. All five items of the instrument, which used a seven-point Likert scale (1 = strongly disagree; 7 = strongly agree), were used in this study. Item scores were summed, consistent with instrument recommendations (Diener et al. 1985), to provide a possible range of scores (5 = lowest, 35 = highest). The instrument validity and reliability was established in prior studies (Larson et al. 1985; Pavot and Diener 1993; Shevlin et al. 1998; Shevlin and Bunting 1994). In this study, the internal consistency of the life satisfaction items, analyzed using Cronbach's alpha (1951), was acceptable (α = .92).

3.2.4 Analysis

The analysis consisted of two steps. First, descriptive statistics, including means, standard deviations, alpha reliability coefficients and correlation coefficients were obtained for each study variable (Table 1). Spearman's rank correlation coefficients were calculated as some activity variables had markedly skewed distributions. Second, hierarchical multiple regression was employed to predict life satisfaction. Only variables which significantly correlated with life satisfaction were entered into the model. Of these, three variables (i.e., skill development need, visiting friends/relatives, and weight lifting) did not make the final analysis as they did not contribute significantly ($p < .05$) to the variance explanation of life satisfaction as determined by the insignificant change in r^2 while controlling for the other

need and activity variables (Table 2). All analysis were performed using SPSS 15 (Statistical Package for the Social Sciences) and analysis procedures were guided by Cohen et al. (2003). Assumptions regarding multiple regression, heterogeneity, autocorrelation and multicollinearity, were verified.

4 Results

4.1 Correlation matrix

Table 1 includes information on the correlation coefficients of study variables. Moreover, information on variable means, standard deviations, and reliability coefficients are also provided in Table 1. Consistent with the need theory literature, satisfaction with each of the needs was positively correlated with life satisfaction. Consistent with the activity theory, three of the activities (i.e., jogging/walking for exercise, weight lifting, and visiting friends/relatives) were positively correlated with life satisfaction ($r = .26$, $p < .01$; $r = .13$, $p < .01$; $r = .09$, $p < .05$, respectively). Inconsistent with the activity theory, gaming (i.e., playing computer games) was negatively correlated with life satisfaction ($r = -.14$; $p < .01$). Moreover, several activities did not significantly ($p < .05$) correlate with life satisfaction. These activities included attending plays, baking/cooking, playing cards, going to the movies, photography, attending religious/spiritual facilities, and swimming.

In addition to the correlations between the independent variables and life satisfaction, the relationship between need and activity independent variables provided an interesting insight. Specifically, the more frequently individuals jogged/walked for exercise, the higher their need satisfaction for each of the needs analyzed in this study. Similar results, but not as consistent were found for those who weight lifted more frequently. Specifically, weight lifting and satisfaction with physical fitness needs were positively correlated ($r = .36$, $p < .01$). In addition, specific needs significantly correlated with other activities. As expected, physical fitness need satisfaction was positively correlated with jogging/walking for exercise ($r = .44$, $p < .01$) and weight lifting ($r = .13$, $p < .01$) and negatively correlated with gaming ($r = -.13$, $p < .01$). Moreover, social need satisfaction was positively correlated with attending plays ($r = .11$, $p < .05$), visiting friends/relatives ($r = .14$, $p < .01$), attending religious/spiritual facilities ($r = .10$, $p < .05$), and jogging/walking for exercise ($r = .17$, $p < .01$). Autonomy need was positively correlated with photography ($r = .11$, $p < .05$) and jogging/walking for exercise ($r = .15$, $p < .01$). Family togetherness was positively correlated with playing cards ($r = .13$, $p < .01$), visiting friends/relatives ($r = .15$, $p < .01$), attending religious/spiritual facilities ($r = .11$, $p < .05$), and jogging/walking for exercise ($r = .13$, $p < .01$), and skill development need was positively correlated with jogging/walking for exercise ($r = .22$, $p < .01$).

4.2 Hierarchical multiple regression

Table 2 includes information on the hierarchical multiple regression analysis performed in this study. Overall, the six variables in the model explained 30% of the variance in life satisfaction. As expected, both activity and need variables were represented in the regression model. This finding is consistent with both activity theory and need theory literature. After controlling for the variance contributed by the other variables, social need satisfaction predicted 19% of the variance in life satisfaction. An additional 9% of the

Table 2 Hierarchical multiple regression analysis summary predicting life satisfaction

Predictors	B	SEB	β (Beta)	Adjusted R^2	ΔR^2
Step 1: Social need	1.88	.19	.44	.19	.19**
Step 2: Autonomy need	1.01	.23	.23	.22	.04**
Step 3: Family togetherness need	.64	.20	.17	.24	.02**
Step 4: Physical fitness need	.60	.16	.19	.27	.03**
Step 5: Jogging/walking for exercise	.06	.03	.10	.27	.01*
Step 6: Computer games	−.11	.03	−.17	.30	.03**

* $p < .05$

** $p < .01$

variance was explained by autonomy, family togetherness, and physical fitness need satisfaction. The activities in the model only predicted 4% of the variance in life satisfaction, and 3 of this 4% was predicted by how frequently a study participant gamed.

5 Discussion

The results from this study provided support for both theoretical frameworks postulating the relationships between leisure and life satisfaction. Specifically, the greater study participants perceived their needs to be satisfied, the higher their life satisfaction (need theory). Likewise, the more individuals participated in recreation activities, the greater their life satisfaction (activity theory). When controlling for the needs and activities which correlated with life satisfaction, need satisfaction explained a greater proportion of variance in life satisfaction than participation in activities with needs predicting approximately 27% of the variance and activities predicting approximately 4% of the variance in life satisfaction.

Despite these findings, there were study results which were inconsistent with both theoretical frameworks which should be addressed in future studies. First, skill development, a need characterized as salient for life satisfaction by other researchers did not significantly explain the variance in life satisfaction when controlling for other needs and activities. The researchers did not find empirical studies which helped to explain this, but a more thorough analysis of the correlation matrix reveals that skill development and autonomy were relatively highly correlated ($r = .60$, $p < .01$) indicating a potential relationship between the variables. As part of the assumption testing for the original model, multicollinearity was tested, and the analysis from the original (not final) regression model indicated multicollinearity was not an issue (i.e., VIF scores were all below 2.0). An alternative explanation is simply that skill development is not as salient as other needs when predicting life satisfaction. Future research is needed to refute or assert this statement.

There were also some issues with activity theory. For instance, researchers currently have a good understanding as to how participating in different physical activities, such as walking/jogging for exercise may improve a person's life satisfaction. Increased physical activity, defined as ''an umbrella term describing any bodily movement produced by the skeletal muscles resulting in energy expenditure'' (Fox et al. 2000, p 8), has been found to help sustain joint structure and function, muscle strength, and appropriate body weight (Miilunpalo 2001; Wankel and Berger 1991). In addition, physical activity also has positive effects on mental health. For example, physical activity has been associated with reducing anxiety and tension as well as depression (Biddle 2000; Wankel and Berger

1991). The literature also indicates that individuals who have more salutary levels of physical health and mental health generally indicate having higher levels of life satisfaction (Dear et al. 2002; King et al. 1998). If it is the case that increased physical activity levels increases life satisfaction, why did participation in weight lifting or swimming (two activities that increase physical activity levels) not significantly predict life satisfaction given the many positive outcomes of being physically active? In reviewing the correlation matrix, it is evident that walking/jogging for exercise was positively correlated with all the needs measured in this study (e.g., satisfaction of autonomy and social needs) whereas swimming and weight lifting were not. These findings, and additional findings from this study identifying needs as more power predictors of life satisfaction than activity participation, infer that future modeling of the relationship between leisure and life satisfaction need to take into consideration these potential relationships. For example, are needs mediating variables in the relationship between participation in recreation activities which promote physical activity and life satisfaction? If this were the case, one could hypothesize that knowing how often a person participates in physical activities is a necessary, but insufficient condition when predicting the relationship between leisure and life satisfaction. One must additionally understand whether this participation satisfies the psychological needs of the individual.

An additional interesting finding was that attending religious/spiritual facilities did not influence the life satisfaction of study participants. This is contrary to findings in prior research which indicates a consistently positive relationship between religiosity and life satisfaction (Campbell 1981; Myers and Diener 1995). In reviewing the correlation matrix, religiosity was positively correlated with social ($r = .10$, $p < .05$) and family togetherness ($r = .11$, $p < .05$) needs, but not significantly correlated with the other needs. It could be inferred from these findings that going to a religious/spiritual facility such as a church, synagogue, temple, or mosque only contributes to one's life satisfaction if this experience satisfied additional needs other than social and family togetherness needs. These findings should be further explored in future research.

The final interesting finding was that the more study participants ''gamed'' (i.e., playing computer games), the more study participants were dissatisfied with their life. These findings are consistent with those of Leung and Lee (2005), which found a relatively small, negative relationship between computer gaming and overall quality of life ($r = -.08$, $p < .1$). But why was this found? Again, reviewing the correlation matrix shows that gaming was negatively associated with a perceived need to be physically active. Is perceived physical fitness then a mediating variable between gaming and life satisfaction? If it is, why did weight lifting, which was correlated with physical fitness need, not sufficiently help predict life satisfaction? Is a perceived physical fitness need a mediating variable only for sedentary activities, such as gaming? In looking at the correlation matrix, it would seem this is possible given that most of the activities analyzed in this study which may be viewed as sedentary did not correlate with life satisfaction and a perceived physical fitness need. A more in-depth analysis into ''computer games'' is also needed. Computer games come in various shapes and sizes. For example, there are computer games played like Solitaire that do not require online connections or additional players or one may be experiencing an online role-playing game within large gaming communities (e.g., Everquest or World of Warcraft). Each has the potential to fulfill a variety of different needs. In making generalizations to other gamers, it is also important to know some demographic information on the individuals who gamed. First, two-hundred and seven study participants indicated they gamed. The majority of individuals who gamed were female (52%), had incomes of $100,000 and over (40%), and were White (99%). In other words, our ability to generalize

our results is delimited to populations similar to our sample. An additional point of interest is that gaming correlated significantly with card playing ($r = .27$, $p < .01$). There was the potential that individuals may have played cards on their computers, thus both activities may have essentially been viewed as the same activity. If this were true, then we would see similar correlations of each activity with other constructs. As noted in the correlation matrix, gaming was significantly negatively correlated with life satisfaction, and playing cards was not correlated.

Satisfaction of human needs as mediating variables would be consistent with the work of both Tinsley and Tinsley (1986) and Iwasaki (2006). Specifically, Tinsley and Tinsley (1986) theoretically developed a leisure experience model which predicted personal growth. The antecedents to personal growth included life satisfaction, satisfaction of psychological needs, and leisure experiences. But is the relationship between leisure and life satisfaction this simple? If satisfaction of human needs mediates the relationship between recreation activity participation and life satisfaction, why did gaming correlate with life satisfaction, but not with various needs?

More recently, Iwasaki (2006) indicated that recreation and leisure activities provided a setting for creating meaning which then help to promote quality of life. In other words, activity participation interacted with some other variable which then helps to improve quality of life. Could this interaction be the satisfaction of one's needs? In other words, does an activity positively or negatively influence life satisfaction only when satisfaction with a specific need is relatively high or low? Again, only future research can assert or refute these questions.

5.1 Study limitations

The results of this study may have been limited by several factors. First, data were collected during March and April. Being relatively colder months in Midwestern communities, this may have influenced the physical activity levels of study participants. Moreover, these months are often the months during which families may travel during Spring Break. Subsequently, this may have negatively affected the study response rate. The study was also limited in the number of activities and needs that were measured. Future studies should expand on the number of activities and needs satisfied. Additionally, because this study collected data cross sectionally (i.e., did not use experimental or longitudinal data collection techniques which are more appropriate at detecting cause and effects), it could be argued that increases or decreases in life satisfaction predicted increased levels of need satisfaction and recreation activity participation. In other words, one could argue for a more top-down approach mentioned earlier in the article than a bottom-up approach. This argument goes well beyond this paper, but interested readers are recommended the work by Feist et al. (1995) and Headey (1991).

5.2 Conclusion

Overall, this study provided a small step in our quest for theory development and refinement when focusing on the relationship between leisure and life satisfaction. Components of two distinct, but potentially integrative, theoretical frameworks predicting the relationship between leisure and life satisfaction were tested. Findings provided support for both theoretical perspectives, but stronger relationships were found between satisfied needs

than with participated activities. Regardless, the various inconsistencies within the two theoretical frameworks suggest that future research is needed to answer the various questions raised in this research study.

References

Baker, D. A., & Palmer, R. J. (2006). Examining the effects of perceptions of community and recreation participation on quality of life. *Social Indicators Research, 75*, 395–418.

Biddle, S. J. H., Fox, K. R., & Boutcher, S. H. (Eds.) (2000). *Physical activity and psychological well-being*. New York: Routledge.

Burnett-Wolle, S., & Godbey, G. (2005). Activity aging 101. *Parks & Recreation, 40*(3), 30–40.

Campbell, A. (1981). *The sense of well-being in America: Recent patterns and trends*. New York: McGraw-Hill Book Company.

Cohen, J., Cohen, P., West, S. G., & Aiken, L. S. (2003). *Applied multiple regression/correlation analysis for the behavioral sciences* (3rd ed.). Mahwah, NJ: Lawrence Erlbaum Associates, Inc.

Cronbach, L. J. (1951). Coefficient alpha and the internal structure of tests. *Psychometrika, 16*(3), 297–334.

Cummins, R. A. (1996). The domains of life satisfaction: An attempt to order chaos. *Social Indicators Research, 38*, 303–328.

Dear, K., Henderson, S., & Korten, A. (2002). Well-being in Australia: Findings from the National Survey of Mental Health and Well-being. *Social Psychiatry and Psychiatric Epidemiology, 37*, 503–509.

Deci, E. L., & Ryan, R. M. (1995). Human autonomy as the basis for true self-esteem. In: M. H. Kernis (Ed.), *Efficiency, agency, and self-esteem* (pp. 31–47). New York: Plenum Press.

Deci, E. L., & Ryan, R. M. (2000). The ''what'' and ''why'' of goal pursuits: Human needs and the self-determination of behavior. *Psychological Inquiry, 11*(4), 227–268.

Diener, E. (1984). Subjective well-being. *Psychological Bulletin, 95*(3), 542–575.

Diener, E. (2000). Subjective well-being: The science of happiness and a proposal for a national index. *American Psychologist, 55*(1), 34–43.

Diener, E., Emmons, R. A., Larson, R. J., & Griffin, S. (1985). The satisfaction with life scale. *Journal of Personality Assessment, 49*(1), 71–75.

Diener, E., & Lucas, R. E. (2000). Explaining differences in societal levels of happiness: Relative standards, need fulfillment, culture, and evaluation theory. *Journal of Happiness Studies, 1*, 41–78.

Diener, E., Suh, E. M., Lucas, R. E., & Smith, H. L. (1999). Subjective well-being: Three decades of progress. *Psychological Bulletin, 125*(2), 276–302.

Driver, B. L., Tinsley, H. E. A., & Manfredo, M. J. (1991). The paragraphs about leisure and recreation experience preference scales: Results from two inventories designed to assess the breadth of the perceived psychological benefits of leisure. In: B. L. Driver, P. Brown, & G. L. Peterson (Eds.), *Benefits of leisure* (pp. 263–286). State College, PA: Venture Publishing Inc.

Everard, K. M. (1999). The relationship between reasons for activity and older adult well-being. *Journal of Applied Gerontology, 18*(3), 325–340.

Feist, G. J., Bodner, T. E., Jacobs, J. F., Miles, M., & Tan, V. (1995). Integrating top-down and bottom-up structural models of subjective well-being: A longitudinal investigation. *Journal of Personality and Social Psychology, 68*(1), 138–150.

Fernandez-Ballesteros, R., Zamarron, M. D., & Ruiz, M. A. (2001). The contribution of socio-demographic and psychosocial factors to life satisfaction. *Ageing & Society, 21*, 25–43.

Fox, K. R., Boutcher, S. H., Faulkner, G. E., & Biddle, S. J. H. (2000). The case for exercise in the promotion of mental health, psychological well-being. In: S. J. H. Biddle, K. R. Fox, & S. H. Boutcher (Eds.), *Physical activity and psychological well-being* (pp. 1–9). New York: Routledge.

Havighurst, R. J. (1961). Successful aging. *The Gerontologist, 1*(1), 8–13.

Headey, B., Veenhoven, R., & Wearing, A. (1991). Top-down versus bottom-up theories of subjective well-being. *Social Indicators Research, 24*, 81–100.

Iwasaki, Y. (2006). Leisure and quality of life in an international and multicultural context: What are major pathways linking leisure to quality of life? *Social Indicators Research.*

King, L. A., Richards, J. H., & Stemmerich, E. (1998). Daily goals, life goals, and worst fears: Means, ends, and subjective well-being. *Journal of Personality, 66*(5), 713–744.

Larson, R. J., Diener, E., & Emmons, R. A. (1985). An evaluation of subjective well-being measures. *Social Indicators Research, 17*, 1–17.

Lemon, B. W., Bengtson, V. L., & Peterson, J. A. (1972). An exploration of the activity theory of aging: Activity types and life satisfaction among in-movers to a retirement community. *Journal of Gerontology, 27*(4), 511–523.

Leung, L., & Lee, P. S. N. (2005). Multiple determinants of life quality: The roles of Internet activities, use of new media, social support, and leisure activities. *Telematics and Informatics, 22*(3), 161–180.

Lloyd, K. M., & Auld, C. J. (2002). The role of leisure in determining quality of life: Issues of content and measurement. *Social Indicators Research, 57*, 43–71.

Longino, C. F., & Kart, C. S. (1982). Explicating activity theory: A formal replication. *Journal of Gerontology, 37*(6), 713–722.

Manfredo, M. J., Driver, B. L., & Tarrant, M. A. (1996). Measuring leisure motivation: A meta-analysis of the recreation experience preference scales. *Journal of Leisure Research, 28*, 188–213.

Maslow, A. H. (1954). *Motivation and personality*. New York: Harper & Row.

Melin, R., Fugl-Meyer, K. S., & Fugl-Meyer, A. R. (2003). Life satisfaction in 18- to 64-year-old Swedes: In relation to education, employment situation, health and physical activity. *Journal of Rehabilitation Medicine, 35*(2), 84–90.

Menec, V. H. (2003). The relation between everyday activities and successful aging: A 6-year longitudinal study. *The Journals of Gerontology Series B: Psychological Sciences and Social Sciences, 58*(2), S74–S82.

Menec, V. H., & Chipperfield, J. G. (1997). Remaining active in later life: The role of locus of control in seniors' leisure activity participation, health, and life satisfaction. *Journal of Aging and Health, 9*(1), 105–125.

Miilunpalo, S. (2001). Evidence and theory based promotion of health-enhancing physical activity. *Public Health Nutrition, 4*(2B), 725–728.

Murray, H. (1938). *Explorations in personality*. New York: Oxford University Press.

Myers, D. G., & Diener, E. (1995). Who is happy? *Psychological Science, 6*(1), 10–19.

Pavot, W., & Diener, E. (1993). Review of the satisfaction with life scale. *Psychological Assessment, 5*(2), 164–172.

Rosenthal, D. H., Driver, B. L., & Waldman, D. (1982). Construct validity of instruments measuring recreationists' preferences. *Leisure Sciences, 5*(2), 89–108.

Ryan, R. M., & Deci, E. L. (2000). Self-determination theory and the facilitation of intrinsic motivation, social development, and well-being. *American Psychologist, 55*(1), 68–78.

Schnohr, P., Kristensen, T. S., Prescott, E., & Scharling, H. (2005). Stress and life dissatisfaction are inversely associated with jogging and other types of physical activity in leisure time: The Copenhagen City Heart Study. *Scandinavian Journal of Medicine & Science in Sports, 15*(2), 107–112.

Sheldon, K. M., Elliot, A. J., Kim, Y., & Kasser, T. (2001). What is satisfying about satisfying events? Testing 10 candidate psychological needs. *Journal of Personality and Social Psychology, 80*(2), 325–339.

Shevlin, M. E., Brunsden, V., & Miles, J. N. V. (1998). Satisfaction with life scale: Analysis of factorial invariance, mean structures and reliability. *Personality and Individual Differences, 25*, 911–916.

Shevlin, M. E., & Bunting, B. E. (1994). Confirmatory factor analysis of the satisfaction with life scale. *Perceptual and Motor Skills, 79*, 1316–1318.

Sirgy, J. M., Michalos, A. C., Ferriss, A. L., Easterlin, R. A., Patrick, D., & Pavot, W. (2006). The quality-of-life (QOL) research movement: Past, present, and future. *Social Indicators Research, 76*, 343–466.

Tinsley, H. E. A., Driver, B. L., & Kass, R. A. (1982). Reliability and concurrent validity of the recreation experience preference scales. *Journal of Educational and Psychological Measurement, 41*(3), 897–907.

Tinsley, H. E. A., & Eldredge, B. D. (1995). Psychological benefits of leisure participation: A taxonomy of leisure activities based on their need-gratifying properties. *Journal of Counseling Psychology, 42*(2), 123–132.

Tinsley, H. E. A., & Tinsley, D. J. (1986). A theory of the attributes, benefits, and causes of leisure experience. *Leisure Sciences, 8*(1), 1–45.

Vittersø, J. (2003). Flow versus life satisfaction: A projective use of cartoons to illustrate the difference between the evaluation approach and the intrinsic motivation approach to subjective quality of life. *Journal of Happiness Studies, 4*, 141–167.

Wankel, L. M., & Berger, B. G. (1990). The psychological and social benefits of sport and physical activity. *Journal of Leisure Research, 22*(2), 167–182.

Wankel, L. M., & Berger, B. G. (1991). The personal and social benefits of sport and physical activity. In: B. L. Driver, P. J. Brown, & G. L. Peterson (Eds.), *Benefits of leisure* (pp. 121–144). State College, PA: Venture Publishing, Inc.