

Social Participation, Flow and Situational Involvement in Recreational Physical Activity

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Abstract

Social factors and the concepts of flow and situational involvement have all been found to be influential in shaping leisure behavior. The purpose of this study was to examine the prevalence of different co-participants during recreational physical activity episodes, along with participants' feelings of flow and situational involvement during recreational physical activity when alone and with different co-participants. Over one-third of the 2053 episodes reported by the 365 adult participants in their log booklets occurred alone, whereas spouse/partner, children, and friends were other common co-participants. Episodes engaged in with someone else were more often characterized by anxiety, boredom, and apathy, but higher levels of situational involvement. Both the prevalence of flow categories and levels of situational involvement differed across types of co-participants, with participation alongside an activity-related club or group characterized by the most positive ratings of both feelings. Finally, higher levels of situational involvement were experienced during flow-like episodes. Implications for both researching and promoting physical activity are discussed.

KEYWORDS: Flow, physical activity, involvement

Introduction

Despite significant emphasis on physical activity promotion and a general awareness of exercise benefits, population-wide activity levels remain low and perhaps in a state of decline (Centers for Disease Control and Prevention, 2001, 2003). Individual determinants of behavior, including factors such as self efficacy, demographic variables, and physical characteristics have received considerable attention in the literature (Sallis & Owen, 1999). However, recent reviews have criticized past research for its overwhelmingly individual focus when examining the influences on physical activity patterns (Giles-Corti & Donovan, 2002; Sallis, Kraft & Linton, 2002). Trost, Neville, Bauman, Sallis and Brown (2002) suggested that factors affecting physical activity can be divided into six categories: a) demographic and biological factors, b) psychological, cognitive and emotional factors, c) behavioral attributes and skills, d) social and cultural factors, e) physical environment factors and, f) physical activity characteristics.

This study was developed to focus on social factors affecting physical activity that was self-described as recreational in nature. In addition to examining with whom adults participate in physical activity, we also examined how two psychological states – situational involvement and flow – vary according to the social context of physical activity episodes. Situational involvement refers to feelings of pleasure and enjoyment in particular situations, while flow describes a state of optimal arousal often spurred by a balance of challenge and skill during an activity. Both of these constructs, as well as various social factors, have all been shown to significantly affect leisure behavior in general (Csikszentmihalyi, 1997; Havitz & Dimanche, 1997; Kyle & Chick, 2002; Mannell & Kleiber, 1997). This paper aims to build on that research in physical activity contexts by examining associations between situational involvement and flow and by determining if situational involvement and flow vary when engaging in physical activity with different co-participants. Specifically, three research questions were examined:

1. Are higher levels of flow associated with higher levels of situational involvement during recreational physical activity?
2. How often does flow occur when engaging in recreational physical activity with various types of co-participants?
3. How do situational involvement levels during recreational physical activity differ with various types of co-participants?

Given that social factors, flow, and situational involvement have all been found to be influential in shaping leisure participation, better understanding these concepts in relation to physical activity may shed light on potential means by which to positively influence physical activity behavior.

Literature Review

Social Support and Physical Activity

In the broad physical activity literature, the concept of social support has been examined widely and has been found to be a major predictor of physical activity levels among diverse study participants. Social support is commonly defined as “any behavior that assists another person in achieving desired goals” (Caplan et al., 1976 as cited in Taylor, Baranowski, & Sallis, 1994, p. 319). It can come from several sources, including family (parents and siblings), friends, peers, and co-workers, and can take several forms, including instrumental,

informational, emotional, or modeling (House & Kahn, 1985; Duncan, Duncan, & Strycker, 2005).

In their review of 38 articles describing factors associated with adults' physical activity participation, Trost et al. (2002) reported that social support was significantly correlated with physical activity in every study that included such a variable. Results from one study showed that individuals with low social support were more than twice as likely to lead sedentary lives as individuals with higher levels of social support (Stahl et al., 2001). The same study found that the social environment was the single most important predictor of physically active behavior. Social support was also found to influence readiness or intent to participate in physical activity in models based on the Theory of Planned Behavior (Courneya et al., 2000). Further, Leslie et al. (1999) employed two three-item scales that asked about the frequency of family and friends exercising with you, offering to exercise with you, and encouraging you to exercise. In both male and female college students, having high social support from both family and friends was significantly related to being classified as sufficiently active (>800 kcal/week). In a study of adults in San Diego, Sallis et al. (1989) reported that modeling and support from friends were significant predictors of the number of vigorous exercise sessions per week, but support from family was not. Orsega-Smith, Payne, and Godbey (2003) examined social support from family and friends in relation to recreation centre usage and found that ratings of support from family were associated with increased participation, while the relationship of support from friends was less clear. Rovniak et al. (2002) reported that social support from friends exhibited a moderate total effect on physical activity among a sample of university students, and that higher levels of social support led to higher levels of self-efficacy for physical activity.

Several intervention studies have also featured social support as a key (or solitary) variable for increasing physical activity (e.g., Dunn et al., 1997; Peterson, Yates, Atwood, & Hertzog, 2005; Toobert, Glasgow, Nettekoven, & Brown, 1998). The impact of social support programs on physical activity was further supported in a review of physical activity interventions conducted by the Task Force on Community Preventive Services (Kahn et al., 2002). Finally, it has also been emphasized that social influences can work to influence physical activity both negatively or positively, in that social support can encourage participation or reinforce sedentary behaviors (Okun et al., 2003).

In summary, the influence of support from family, friends, and others has been studied frequently, especially in research that adopts a social psychological (or social cognitive) perspective to analyze exercise and physical activity participation. The results of the vast majority of individual studies and reviews uphold the premise that social support, including actually participating in activities with others, is an important influence on physical activity.

Social Factors and Leisure Participation

Substantial attention has also been paid to how social factors motivate and facilitate leisure participation and involvement more generally (e.g., Kyle & Chick, 2002; Mannell & Kleiber, 1997). For example, several studies have examined the notion that social support obtained through leisure participation can buffer the effects of mental and physical stress (Iso-Ahola & Park, 1996; Cassidy, 2005; Mannell & Kleiber, 1997). Further, research has suggested that leisure contributes to relationship quality through joint participation in leisure activities (Flora & Segrin, 1998). Kyle and Chick (2002) reported that family and social relationships were cited as the most important reason for engaging in camping for leisure. Overall, research has demonstrated how leisure can affect social relationships, as well as how social factors can affect leisure.

Traditionally, it was thought that simply participating in joint leisure had beneficial relational outcomes, but current research suggests that the quality of the joint endeavor is more important than the quantity. The experiences that one has with others differ across contexts and depend on the level of competition versus cooperation and social interaction (Flora & Segrin, 1998). Social context has also been shown to play a significant role in contributing to the experience of joint leisure. For example, television viewing has been shown to have very little positive effect on relationships due to a lack of direct interaction (Flora & Segrin, 1998). As such, contexts that allow for direct interaction may be more conducive to positive outcomes and feelings of enjoyment (Flora & Segrin, 1998). Additionally, participation in leisure with friends may be more likely to produce positive feelings (Iso-Ahola & Park, 1996; Larson, Mannell, & Zuzanek, 1986; Okun et al., 2003), while family leisure, on the other hand, has been shown to produce constraints that affect enjoyment, especially for mothers (Brown, Brown, Miller, & Hansen, 2001). Therefore, examining experiences with different co-participants is important to understanding behavior and extends beyond the ways social support has been studied in past physical activity research. In summary, co-participants have been found to have an impact on the experience of leisure in other activities, but little is known about the influence of co-participants during physical activity episodes.

Flow

Flow was first conceptualized by Csikszentmihalyi (1975) as a way to examine optimal experiences. The model of flow requires a balance between the challenge offered by the activity and the skills required to perform the activity (Csikszentmihalyi, 1975). Too much challenge is seen as anxiety-producing, whereas an inordinate level of skill is likely to result in boredom. In addition to a balance between skills and challenge, flow is characterized by intense involvement, a loss of sense of time, clarity of goals, deep concentration, a transcendence of the self, lack of self consciousness, and a belief in the intrinsic value of the experience (Bryce & Haworth, 2002; Mannell & Kleiber, 1997). This optimal psychological state is described by Jackson and Eklund (2002) as “those moments when everything comes together for the performer” (p. 133). Particularly relevant to physical activity participation, flow is seen as a desirable state that carries the potential to enhance self-esteem and promote further participation (Stein, Kimiecik, Daniels, & Jackson, 1995). Flow was originally conceptualized following a series of extensive interviews (Csikszentmihalyi, 1975), but has also been studied using the experience sampling method (e.g., Havitz & Mannell, 2005) and through laboratory experiments (e.g., Mannell & Bradley, 1986) and questionnaires (e.g., Webster, Trevino & Ryan, 1993). Measurement of flow is typically most concerned with the challenge-skill dyad for determining if flow is present (Jackson & Eklund, 2002; Voelkl & Ellis, 1998).

Research has shown that flow can be achieved in several areas of everyday life however, the leisure context is still considered, by many, to be inherently conducive to flow given that leisure contexts often afford opportunities for free choice and to express one's personality (Mannell & Kleiber, 1997; Leckey & Mannell, 2000). Flow has been examined in relation to particular leisure activities, such as electronic media use. For example, Mannell, Kaczynski, and Aronson (2005) reported that “relaxed leisure” activities such as television or reading are not conducive to flow because they often lack the necessary requirement of presenting challenge. Interestingly, video games offered the greatest opportunity to experience flow, perhaps because many automatically adjust the challenge level to match that of the users' skills (Mannell et al., 2005). Jackson and Eklund (2002) examined flow in physical activity by employing a flow state scale and a dispositional flow scale in both recreational and elite

athletes. They determined that both scales were useful tools for the examination of flow in physical activity. Mannell et al. (2005) also found that adolescents who participated in physically active leisure more frequently were more likely to experience flow in their physical activity than less physically active youth. Although flow has frequently been studied and has provided interesting insight into motivation to participate in various recreational and non-recreational pursuits, little has been written about the role of co-participants and whether the presence of others affects the likelihood of experiencing flow during physical activity.

Situational Involvement

Social judgment theory was originally developed in the mid-20th Century to study relationships between ego involvement and behavior (Sherif & Cantril, 1947). Involvement was adopted by leisure researchers in the mid-1980s to examine relationships with people's leisure choices (Havitz & Dimanche, 1997). Involvement has been defined by Havitz and Dimanche as an "unobservable state of motivation, arousal or interest toward a recreational activity or associated product, evoked by a particular stimulus or situation, and which has drive properties" (p. 246; adapted from Rothschild, 1984, p. 216). Involvement, at its basic level, speaks to a person's interest in a particular activity, product, or context. It is typically conceptualized as including components of enjoyment, fun, or excitement (Munson & McQuarrie, 1987). Indeed, Havitz and Dimanche found that, in the majority of dozens of leisure involvement studies, interest and pleasure are inseparable concepts. In their recently published structural analysis of leisure, Watkins and Bond (2007) noted that although passive and solitary contexts were most commonly sought when seeking leisure-based escape, "physically active and socially oriented pursuits were also related to leisure if they removed or 'blotted out' pressure. The experience of mentally relaxing and feeling pleasure (i.e., defined in sensuous terms such as 'to indulge myself' or 'to feel physically exhausted') served to divert attention, restore well-being, and relieve pressure" (p. 298).

Considered temporally, two types of involvement have been identified. First, situational involvement "reflects temporary feelings of involvement that accompany a certain situation" (Richins, Bloch & McQuarrie, 1992, p. 143). Second, enduring involvement refers to ongoing feelings or concerns that a consumer or participant brings into a situation (Richins et al., 1992). In leisure studies, enduring involvement can be understood as "ego" involvement or one's motivations to participate (Havitz & Mannell, 2005). While enduring involvement is considered to be stable, situational involvement is seen to differ depending on the situation (Havitz & Mannell, 2005). Traditionally, situational involvement and enduring involvement have been studied together to examine involvement responses (Richins et al., 1992). More recently, however, it has been suggested that research should separate the two constructs in order to gain a better understanding of how each is meaningful in the study of leisure (Naylor, 2006).

Situational involvement, as mentioned earlier, is context-dependant and, therefore, the relevance or importance that one places on an activity will differ across situations (Havitz & Mannell, 2005). Although co-participation may be an instrumental factor affecting the enjoyment one gets from participating in an activity, no research has considered co-participants and situational involvement to examine the relationships between the two.

Flow and situational involvement have, however, been studied in relation to one another. Havitz and Mannell (2005) reported that when high levels of enduring involvement were reported, higher levels of flow were also found. Situational involvement was found to influence or mediate this relationship in that immediate psychological variables such as enjoyment influence subsequent leisure behavior. Although Havitz and Mannell examined

a broadly defined set of leisure contexts, situational involvement has not been explicitly examined with respect to physical activity and how it affects participation.

In summary, past research has revealed strong relationships between leisure behavior and either flow or situational involvement or both (e.g., Chou & Ting, 2003; Csikszentmihalyi & Csikszentmihalyi, 1988; Havitz & Mannell, 2005; Naylor, 2006; Pritchard & Brunson III, 2001). Similarly, the social context of leisure activities is also important for understanding the quantity and quality of participation (e.g., Kyle & Chick, 2002; Naylor, 2006). In this study, we examine simultaneously the three concepts of flow, situational involvement, and social participation to better understand their relationship during recreational physical activity.

Methods

This study is part of a larger project on individual, social, and environmental influences on physical activity. The following paragraphs outline the data collection process that was used, the measures that were employed, and the analyses undertaken for the present paper.

Participants were recruited from four neighborhoods within the city of Waterloo, Ontario. The neighborhoods were each approximately one square mile in size and were selected because they represented a mix of development patterns and land uses. Although information about income and race were not collected from participants, 2001 Canadian Census data showed that median household income in the four neighborhoods ranged from \$40,060 to \$82,738 and the percentage of residents in each district born outside of Canada ranged from 16.5% to 23.5% (race data for each neighborhood were not available). As is described further below, study respondents were highly educated, with the percentage of participants in each neighborhood that had graduated from college ranging from 50.0% to 82.4%.

Study Area and Sample

From property lists provided by municipal officials, 250 households were randomly selected from each neighborhood and were mailed letters to introduce them to the study and to request their participation. In selecting households, significant steps were taken to ensure that multi-household properties (e.g., triplexes, apartments) were appropriately represented in the sampling frame. Study materials were distributed door-to-door by trained research assistants and all adult (18 and older) members of the household were asked to participate. Participants were paid a nominal incentive of five dollars upon completion of the study and were offered the opportunity to receive personal and generalized feedback about the study and their physical activity participation. In total, 960 packages were distributed and 585 were completed across all four of the neighborhoods for a response rate of 61%. To avoid artificial dependence among the data points, especially with respect to co-participants during physical activity episodes, this study reports data from only one randomly selected respondent from each unique household in the study.

Measures

This study utilized a detailed activity log booklet in which participants recorded and provided details about all their episodes of physical activity over a seven-day period that were 10 or more minutes in duration. As is described further below, participants listed any co-participants they engaged with and also responded to four Likert-type questions for each episode rating the challenge and skill involved as well as their feelings of enjoyment and pleasure during the activity. Additionally, the purpose of each physical activity episode was categorized by participants as one of recreation, transportation, household, or job-related. To facilitate this selection, in the detailed instructions for the log booklet, respondents were

provided with brief definitions for each purpose category as taken from the International Physical Activity Questionnaire (Craig et al., 2003). As mentioned above, this study uses data from only those episodes classified as “recreation”, which was defined as “physical activity that was done for recreation, sport, exercise, or leisure” (Craig et al., 2003).

The current study focused on the prevalence of different co-participants and the participants’ feelings of flow and situational involvement during physical activity episodes. Co-participants were listed by study participants in an open-ended fashion. The descriptions provided were coded into several categories, including alone, with spouse/partner, children, friends, co-workers, other relative, pet, club/group (e.g., a running club), and other. As is described further below, a relatively small number (e.g., 8%) of episodes included multiple types of co-participants which were collapsed into appropriate groupings (e.g., spouse and pet). However, those few episodes which included two or more types of co-participants were not analyzed in the current study.

A two-item scale used to measure situational involvement was taken from a longer 10-item instrument developed by Naylor (2006). The shorter version was used here in an attempt to minimize respondent fatigue as the log booklet was long and detailed. For each episode of physical activity, participants were asked to indicate their level of agreement on a 7-point scale with two statements: “That physical activity episode was pleasurable” and “I was really enjoying doing that”. A coefficient alpha of .96 was computed for the two-item scale and the mean of the two items (when both items were answered) was used as the measure of situational involvement for each episode. These values were standardized within individuals such that the resulting z-score represented a value that indicated the level of situational involvement for that episode relative to each participant’s overall level of situational involvement across all the recreational physical activity episodes they reported (i.e., above, below, or at the mean of all of his or her episodes).

To measure flow during recreational physical activity episodes, participants were asked to respond to two items, “The challenge of the activity for me wa ...” and “My skills in and knowledge of the activity were...”, on a 7-point scale ranging from “very low” to “very high” (Mannell et al., 2005). According to the reformulated model of flow described by Csikszentmihalyi and Csikszentmihalyi (1988) and Ellis, Voekl, and Morris (1994), flow occurs only when both the skill and challenge ratings for an episode are higher than the individual’s mean skill and challenge levels across all of their reported episodes. This model has been verified by studies showing that significantly greater levels of indicators of flow (e.g., positive affect, arousal, passing of time) occur when both challenges and skills exceed typical levels (Carli, DelleFave, & Massimini, 1988; Csikszentmihalyi & Nakamura, 1989; Massimini, Csikszentmihalyi, & Carli, 1987). As such, in this study, the mean of challenge and skill were calculated for each participant’s recreational physical activity episodes and this mean was used to determine flow on an episodic basis. For example, where both challenge and skill ratings were greater than the individual’s respective mean values, the episode was considered to be flow. Where challenge was greater than the mean but skill was less than the mean, the episode was classified as anxiety-producing. When challenge was less than the mean but skill was greater than the mean, boredom was said to occur. Finally, where both challenge and skill were below their respective means, the episode was coded as apathy (Csikszentmihalyi & Csikszentmihalyi, 1988).

Analyses

To investigate the three research questions, a series of statistical analyses involving analysis of variance, t-tests, and chi-square tests were conducted. Initially, frequencies were com-

puted to explore the prevalence of different co-participants during episodes of recreational physical activity. Subsequently, analysis of variance was used to determine whether differing levels of situational involvement were experienced during episodes classified into the four flow categories. Finally, chi-square and analysis of variance tests were used to examine flow and situational involvement, respectively, during episodes with different co-participants.

Results

A total of 365 participants reported at least some recreational physical activity episodes during the course of the study week. However, ten people declined to answer all of the demographic questions in the survey. Table 1, therefore, describes the sample characteristics for the remaining 355 participants in the study, including 127 males (35.8%) and 228 females (64.2%).

TABLE 1
Sample Characteristics

Characteristic	N	%
Sex		
Male	127	35.8%
Female	228	64.2%
Total	355	100.0%
Age		
18-24	26	7.3%
25-34	74	20.8%
35-44	84	23.7%
45-54	73	20.6%
55-64	42	11.8%
65-88	56	15.8%
Total	355	100.0%
Marital Status		
Married	242	68.2%
Marriage like relationship	25	7.0%
Single, Never Married	49	13.8%
Divorced	14	3.9%
Separated	6	1.7%
Widowed	19	5.4%
Total	355	100.0%
Highest Level of Education		
Attended some high school	18	5.1%
Graduated from high school	47	13.2%
Attended some university or college	52	14.6%
Graduated from university or college	136	38.2%
Completed a postgraduate degree	98	27.5%
Other	5	1.4%
Total	356	100.0%

Table 1 Note: A total of 10 responses were missing from each of the four variables and are not included in the table data.

The age of respondents ranged from 18 to 88 years old and nearly two-thirds of the sample was aged 25–54 (65.1%). The majority of participants reported that they were married at the time of the study (68.2%), and, overall, the sample was well educated as 80.5% of the participants reported that they had attended at least some post-secondary schooling.

A total of 2053 physical activity episodes classified as recreation were reported during the study week, with a mean of 6.33 episodes per person; an average of just under one episode per day. No significant differences were found ($t=1.49$, $p=.14$) between men (6.26) and women (5.83) with respect to the number of reported episodes.

Participants reported that their recreational physical activity episodes occurred with a variety of co-participants. Table 2 illustrates that of the 1939 episodes for which valid co-participant data were available, participating alone was the most common situation (704). However, friends (227), children (206), spouse/partner (202), pets (95), club/group (81), other relatives (77) and co-workers (38), were also commonly reported co-participants.

A mean score of 5.51 was found for the measure of situational involvement in recreational physical activity and responses ranged from 1.75 to 7.00 on the seven-point scale. Table 3 illustrates that 388 (18.9%) episodes were characterized by feelings of flow, while anxiety was reported for 521 episodes (25.4%), and boredom and apathy were found in 408 (19.9%) and 711 (34.6%) episodes, respectively.

Research Question Analyses

Research question one attempted to determine whether higher levels of flow are associated with higher levels of situational involvement during recreational physical activity. As Table 3 also illustrates, levels of situational involvement differed significantly between episodes classified into the four flow categories ($F=4.07$, $p=.007$). Situational involvement was highest within the flow category (5.75) and lowest within the apathy category (5.21). Anxiety (5.62) and boredom (5.57) were characterized by similar and intermediate levels of situational involvement.

Our second research question aimed to examine how flow during physical activity differed with various co-participants. Table 4 shows the statistically significant differences in the occurrence of the four flow classifications during recreational physical activity alone versus with anyone else ($\chi^2 = 34.23$, $p<.001$). Flow occurred somewhat more often with someone else (51.8%) than alone (48.2%), but the differences were minimal. Anxiety was much more common with others (62.0%) than alone (38.0%). Similarly, boredom was more common among episodes with co-participants (70.8%) than episodes without co-participants (29.2%), and apathy was also more common with co-participants (67.1%) than without co-participants (32.9%).

After investigating the prevalence of flow while alone versus with others, the frequency of the four flow categories was examined during episodes with various co-participants. Table 5 illustrates that in recreational physical activity with one's spouse or partner, feelings of flow (10.9%) and boredom (15.3%) were least likely, while anxiety (31.2%) and apathy (42.6%) occurred more often. A similar trend occurred during participation in physical activity with children as flow was again the least likely feeling (14.6%) and apathy most common (35.6%), whereas anxiety and boredom were experienced in 23.4% and 26.3% of episodes, respectively. In participation with friends, apathy was again most common (36.2%), followed by anxiety (26.3%), boredom (23.2%) and flow (14.3%). When participating with co-workers, anxiety was most common (36.8%), followed by apathy (31.6%), while flow and boredom occurred with equal but lesser frequency (15.8% each). Apathy was most common (47.3%) when participating with pets, followed by boredom (33.3%), flow (16.1%),

TABLE 2
Number of Physical Activity Episodes Reported with Different Co-participants

	Alone	Partner / Spouse	Children	Other Relative	Friend	Co-worker	Pet	Club / Group	Other	Column %	Row Total	% of total episodes
Alone	704										704	36.3%
Row %	100.0%										100.0%	
Partner/Spouse		202	129	9	31	0	30	1	1	1	403	20.8%
Row %		50.1%	32.0%	2.2%	7.9%	0.0%	7.4%	0.2%	0.2%	0.2%	100.0%	
Children		129	206	14	24	0	21	1	0	0	395	20.4%
Row %		32.7%	52.2%	3.5%	6.1%	0.0%	5.3%	0.3%	0.0%	0.0%	100.0%	
Other Relative		9	14	77	11	0	2	1	0	0	114	5.9%
Row %		7.9%	12.3%	67.5%	9.6%	0.0%	1.8%	0.9%	0.0%	0.0%	100.0%	
Friend		31	24	11	227	0.0%	12	1	0	0	306	15.8%
Row %		10.1%	7.8%	3.6%	74.2%	0.0%	3.9%	0.3%	0.0%	0.0%	100.0%	
Co-worker		0	0	0.0%	0.0%	38	0	1	0	0	39	2.0%
Row %		0.0%	0.0%	0.0%	0.0%	97.4%	0.0%	2.6%	0.0%	0.0%	100.0%	
Pet		30	21	2	12	0.0%	95	0.0%	0	0	160	8.3%
Row %		18.8%	13.1%	1.3%	7.5%	0.0%	59.4%	0.0%	0.0%	0.0%	100.0%	
Club / Group		1	1	1	1	1	0	81	2	2	88	4.5%
Row %		1.1%	1.1%	1.1%	1.1%	1.1%	0.0%	92.0%	2.3%	2.3%	100.0%	
Other		1	0	0	0	0	0	2	18	21	21	1.1%
Row %		4.8%	0.0%	0.0%	0.0%	0.0%	0.0%	9.5%	85.7%	100.0%	100.0%	
Total	704	403	395	114	306	39	160	88	21	21	1939	
Column %	100.0%	57.2%	56.0%	16.2%	43.5%	5.4%	22.8%	12.4%	3.0%	3.0%	100.0%	

Table 2 Notes:1. The number of total physical activity episodes with valid co-participants reported = 1939 (including episodes engaged in alone). However, because some episodes involved more than one type of co-participant, the total of the rows describing the number of episodes involving individual co-participant categories sum to more than 1939. Similarly, the percentages in the “% of total episodes” column represent the percentage of total (1939) episodes that involved each type of co-participant, and because some episodes involved multiple types of co-participants, these percentages necessarily sum to more than 100%.

TABLE 3
Level of Situational Involvement in Four Flow Model Categories

Flow Category	N	%	Situational Involvement ¹
Flow	388	18.9%	5.75a
Anxiety	521	25.4%	5.62b
Boredom	408	19.9%	5.57b
Apathy	711	34.6%	5.21c

Table 3 Notes: $F=4.76$, $p<.01$; Mean values with different superscript letters were significantly different from one another at the $p<.05$ level.

TABLE 4
Flow Classifications During Physical Activity Alone and with Anyone

	Alone	Anyone	Total
Flow	171 (48.2%)	184 (51.8%)	355
Anxiety	186 (38.0%)	303 (62.0%)	489
Boredom	114 (29.2%)	277 (70.8%)	391
Apathy	225 (32.9%)	458 (67.1%)	683
Total	696 (36.3%)	1222 (63.7%)	1918

TABLE 5
Flow Classifications During Physical Activity Episodes with Various Co-participants

	Flow	Anxiety	Boredom	Apathy	Total
Partner	22	63	31	86	202
	10.9%	31.2%	15.3%	42.6%	100.0%
Children	30	48	54	73	205
	14.6%	23.4%	26.3%	35.6%	100.0%
Friend	32	59	52	81	224
	14.3%	26.3%	23.2%	36.2%	100.0%
Co-worker	6	14	6	12	38
	15.8%	36.8%	15.8%	31.6%	100.0%
Pet	15	3	31	44	93
	16.1%	3.2%	33.3%	47.3%	100.0%
Club/Group	26	37	4	14	81
	32.1%	45.7%	4.9%	17.3%	100.0%
Total	131	224	178	310	843
		26.6%	21.1%	36.8%	100.0%

and anxiety (3.2%). Finally, during participation with a club/group, anxiety (45.7%) was the most frequent feeling, while flow (32.1%) occurred slightly less often, and apathy (17.3%) and boredom (4.9%) were much less common. Overall, statistically significant differences were found between episodes with different co-participants with respect to the likelihood of experiencing the different flow categories ($\chi^2=88.39, p<.001$). Respondents appeared to be much more likely to experience flow or anxiety—two high challenge situations—when participating with a club/group, whereas apathy was most common when participating with one's pet, children, spouse/partner, or friends.

The third research question investigated whether situational involvement during recreational physical activity differed with various co-participants. In examining situational involvement during physical activity episodes that occurred alone versus with anyone else, statistically significant differences were found ($t=-7.53, p<.001$). For episodes participated in alone, the mean standardized situational involvement rating was significantly lower ($M=-0.19, SD=0.76$) than during episodes with anyone else ($M=0.13, SD=0.82$).

Levels of situational involvement were then examined during episodes with various co-participants (Table 6). Statistically significant differences were found between the co-participant groups of spouse/partner, children, friend, co-worker, pet, and club/group ($F=2.86, p<.05$). Overall, participating with a club/group ($M=.26$) and friends ($M=.18$) produced the highest standardized situational involvement ratings. Spouse/partner ($M=.08$) and children ($M=.06$) were similar in producing intermediate ratings, while the lowest ratings occurred during episodes with pets ($-.03$) and co-workers ($-.09$).

TABLE 6
Level of Situational Involvement with Various Co-participants

	N	Mean ¹	Std. Deviation	F	p
Club/group	81	0.26 ^a	0.90		
Friend	225	0.18 ^a	0.86		
Spouse/Partner	201	0.08 ^b	0.74	2.86	.04
Children	204	0.06 ^b	0.81		
Pet	93	-0.03 ^c	0.81		
Co-worker	38	-0.09 ^c	0.83		

Table 6 Notes: Mean values with different superscript letters were significantly different from one another at the $p<.05$ level.

Discussion

This study explored the social nature of recreational physical activity participation and participants' perceptions of flow and situational involvement during these physical activity episodes. Specifically, we wanted to determine if flow and situational involvement were affected by participating in activity with various co-participants and to determine whether increases in flow are associated with increases in situational involvement.

Our data suggested that situational involvement scores were highest during flow-like episodes as opposed to episodes characterized by anxiety, boredom, or apathy. While it cannot be said that higher levels of situational involvement cause higher levels of flow or vice

versa, perhaps experiencing pleasure or enjoyment during an activity has an effect on how one perceives the challenge and skills presented by the activity. Alternatively, perhaps when one believes their skills are a good match with the challenge in an activity, they are more likely to enjoy the activity or experience pleasure from it (Havitz & Mannell, 2005). Irrespective of causality, this positive relationship is intuitive.

Our data also showed that anxiety, boredom, and apathy occurred more commonly when participating in recreational physical activity with co-participants than alone. For boredom and apathy—two low challenge contexts—this may be explained by the challenge level of an activity having to be reduced to accommodate for the skills of various co-participants. Similarly, participating in activities with others may mean that one's skills may not be sufficient for the group's activity and intensity level, thereby resulting in feelings of anxiety. Future research could attempt to confirm or disconfirm these potential explanations about the occurrence of the four flow categories during solitary and joint physical activities.

We also examined the prevalence of flow categories with various types of co-participants. For example, participation with a club or a group was associated with higher levels of flow and anxiety—two high challenge contexts. Again, these positive relationships are intuitive. Because these contexts are often freely chosen (Leckey & Mannell, 2000), individuals might naturally be expected to align themselves with groups in which participants shared similar interests and skill sets. This level of homogeneity could be encouraged by recreation professionals seeking to promote flow-inducing physical activity contexts. It is also possible that being with a group or club helps to balance out skill and challenge levels because of the presence of a coach or other participants who are knowledgeable about the activity. In contrast, flow was the least common feeling and apathy most common when participating with one's spouse/partner or children or friends. Again, it is possible that when participating with those who are most significant in our lives, skill and challenge levels have to be adjusted (likely lowered) to match those of the co-participants, thereby potentially resulting in apathy (Larson et al., 1986). Similarly, compromises made to find activities that are feasible for both participants may mean that the chosen activities may require lower skills and provided lesser challenge and may not be favored by either party.

Finally, we also investigated how situational involvement in recreational physical activity differed in the company of various co-participants. Episodes engaged in alone had significantly lower situational involvement ratings than episodes engaged in with a co-participant. This difference could possibly be attributed to increased feelings of pleasure and enjoyment as a result of having co-participants to engage in an activity with. Further, statistically significant findings were found between participation contexts with various co-participants. Physical activity episodes with co-workers and pets were associated with the lowest levels of situational involvement. It is possible that participating with a co-worker or pet brings with it a sense of responsibility or obligation and a lack of free choice that reduces the amount of pleasure and enjoyment experienced. At the other end of the spectrum, participating with a club/group or friend produced the highest levels of situational involvement, more so than participating with children or a spouse/partner. This latter result is consistent with the finding reported above that apathy was more common with immediate family members and also with past research that has shown that activities experienced in the presence of friends were rated more favorably than those engaged in with family members (Larson et al., 1986).

Re-Examining the Flow Typology

Interestingly, flow was less likely during episodes with co-participants than alone, but heightened situational involvement was more likely during episodes with co-participants

than alone. Perhaps co-participation in recreational physical activity is both positive and negative in that it produces feelings of pleasure and enjoyment, yet it impacts the participant's ability to reach an optimal balance between skills and challenges. Taken further, these observations segue into a challenge of the four labels used in Csikszentmihalyi's (1988) flow typology. It could be argued that three of the four labels (anxiety, boredom, and apathy) have more negative than positive meanings associated with them. It seems incongruent, given the way respondents are placed into the typology based on skill and challenge scores above or below the mean, that approximately 75% of daily life episodes, or in this case physical activity episodes, would be described in predominantly negative terms. Indeed, Kleiber (2000) challenged the privilege generally afforded flow and other manifestations of high intensity activity in leisure research circles.

The additional variables examined in this study are instructive in that regard. For example, our data, which include the situational involvement measures, suggest that many episodes placed into the boredom category might be more accurately cast as relaxation. This makes intuitive sense in that the boredom category elicited slightly above average situational involvement scores overall, and also when club/group members, friends, children, and spouses/partners were present (see Table 6). Our suggestion regarding relaxation as a more appropriate heading for this category can be traced in part to Kleiber's (2000) lament regarding the "neglect of relaxation" (p. 82) in the leisure literature. In so doing, it is necessary to argue for some level of congruence between physical activity and relaxation. Contexts such as a mother playing with a toddler in a playground, a couple walking a dog at a park, or two parents pushing a baby stroller through a neighborhood come to mind. That said, there are obviously many forms of relaxation, including some discussed by Kleiber, that include no physical activity whatsoever. Additional support for consideration of this terminology was provided by Massimini and Carli (1988).

Like the flow category, the anxiety-inducing contexts also generated higher than average overall levels of situational involvement. In contrast to the previous example regarding the boredom category, we do not propose re-naming the anxiety category. However, we would note that because situational involvement levels seem relatively elevated in these contexts, anxiety-producing leisure experiences are not necessarily negative situations and may be fertile ground for studying physical activity. Our data do not provide the level of specificity needed to ascertain why anxiety was present. It could relate to the activity itself; for example, one person may be less motivated or in poor shape relative to his or her jogging partner. Indeed, in their conceptual discussion of physical activity and social comparison theory, Frederick, Havitz, and Shaw (1994) argued that self-improvement contexts, those in which physical activity participants deliberately compare themselves with similar but slightly superior others, are most common. It might be expected that some level of heightened anxiety would accompany such situations. Anxiety may also arise from issues unrelated to the physical activity context; for example, a partnered couple discussing their tight financial situation while out for a walk on a community trail. In that sense, it is interesting to ponder whether physical activities themselves or various social contexts might mediate overall levels of satisfaction.

It is important to recognize that the four-quadrant model proposed by Csikszentmihalyi and Csikszentmihalyi (1988) and, especially, the psychometric heuristic used to place episodes into it may result in some spurious interpretations. For example, an episode where skill and challenge levels are both slightly above average and thus classified as flow may be more similar to an episode where skill and challenge levels are both slightly below average

(apathy) than it is to a flow episode in which both skill and challenge are well above average. We have illustrated this dilemma in Figure 1. Those episodes placed near the center of the diagram in the lighter portions may be relatively ambiguous in terms of their fit in a particular quadrant and with respect to their relationship to similarly placed episodes in other quadrants. These zones of ambiguity extend out from the center where the boundaries of the various quadrants meet. By contrast, those episodes placed into the darker areas are more clearly identified with the quadrant in which they are located. Massimini and Carli (1988, p. 270) proposed a similar diagram which includes the four aforementioned categories (anxiety, apathy, boredom and flow) as well as four intermediate categories (worry, relaxation, control, and arousal) only one of which, the previously discussed relaxation, is included on Figure 1. In deference to the focus on other issues included in this research, we chose to delimit our placement of episodes into four categories rather than the eight described by Massimini and Carli, though this remains a topic and option for future research.

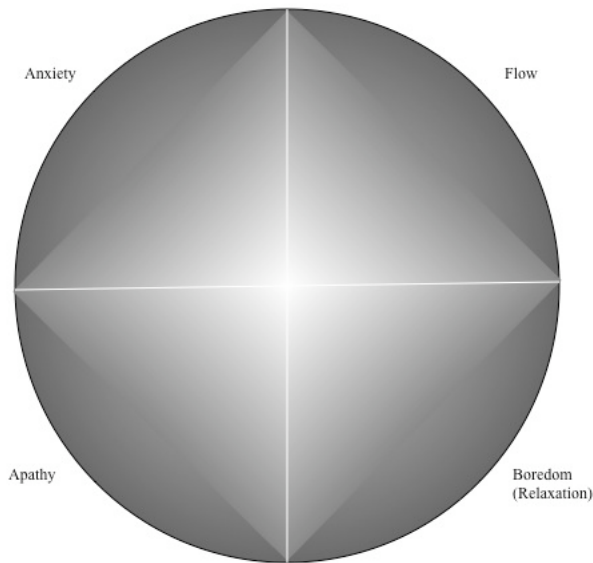


FIGURE 1. *Anxiety, apathy, boredom and flow expressed as a continuum.*

Limitations

While the current study yielded a variety of interesting findings regarding situational involvement and flow in physical activity, it was subject to certain limitations. First, because this study only examined recreational episodes of physical activity, we did not compare feelings of flow and situational involvement during other types of physical activity episodes or relative to non-physical activity episodes. Second, because respondents were asked to report their co-participants in an open-ended manner, episodes with multiple co-participants were difficult to code. As a result, approximately 8% of episodes were not used in the examination

of flow and situational involvement with various co-participants. However, future research could examine the dynamics of engaging in physical activity with multiple types of co-participants. Finally, due to the cross-sectional design of this study, we could not determine causality, such as whether situational enjoyment causes flow or vice versa.

Conclusion

This study represents one of the first attempts to integrate social contexts, flow, and situational involvement, three variables that have heretofore been found to be influential in shaping leisure participation. Given that these factors have been relatively understudied, especially during physical activity, the discipline might benefit from further research in this area. For example, research that aims to determine factors within physical activity (e.g., social support) that increase the feelings associated with situational involvement (pleasure and enjoyment) would be beneficial to practitioners looking to create programs aimed at increasing physical activity. Also, research that examines possible ways to match challenge and skills in physical activity could aid in the development of programs with flow-producing potential. Further, an examination of whether feelings of situational involvement and flow during physical activity encourage future participation might be interesting and beneficial from the perspectives of infrastructure and policy development. Future research examining flow and situational involvement and physical activity could also focus on the intensity of the activity and whether mild, moderate, or more strenuous participation has an affect on the likelihood of experiencing flow and enjoyment. Finally, further research that aims to examine if co-participation is good for encouraging flow and situational involvement could change the way we encourage physical fitness, perhaps by placing more emphasis on groups or clubs. For example, experimental research has shown walking and running groups to be effective for encouraging physical activity, and the results of this study suggest that greater use of these in community settings may be beneficial (Brownson et al., 2004; Fahrenwald, Atwood, & Johnson, 2005; Fisher & Li, 2004). Overall, initiatives aimed at enhancing the frequency or intensity of enjoyment and flow in physical activity contexts have potential to increase participation and ideally overall population health as well.

References

- Brown, P. R., Brown, W. J., Miller, Y. D., & Hansen, V. (2001). Perceived constraints and social support for active leisure among mothers with young children. *Leisure Sciences, 23*, 131-144.
- Brownson, R. C., Baker, E. A., Boyd, R. L., Caito, N. M., Duggan, K., & Housemann, R. A. et al. (2004). A community-based approach to promoting walking in rural areas. *American Journal of Preventive Medicine, 27*(1), 28-34.
- Bryce, J., & Haworth, J. (2002). Wellbeing and flow in sample of male and female office workers. *Leisure Studies, 21*, 249-263.
- Carli, M., DelleFave, A., & Massimini, F. (1988). The quality of experience in flow channels: Comparison of Italian and U.S. students. In M. Csikszentmihalyi & I.S. Csikszentmihalyi (Eds.), *Optimal experience: Psychological studies of flow in consciousness* (pp. 288-306). New York: Cambridge University Press.
- Cassidy, T. (2005). Leisure, coping and health: The role of social, family, school and peer relationship factors. *British Journal of Guidance & Counseling, 33*(1), 51.
- Centers for Disease Control and Prevention. (2001). Physical activity trends: 1990-1998. *Morbidity and Mortality Weekly Report, 50*, 166-169.

- Centers for Disease Control and Prevention. (2003). Prevalence of physical activity, including lifestyle activities among adults - United States, 2000-2001. *Morbidity and Mortality Weekly Report*, 52, 764-768.
- Chou, T. J., & Ting, C. C. (2003). The role of flow experience in cyber-game addiction. *CyberPsychology Behavior*, 6(6), 663-675.
- Courneya, K. S., Plotnikoff, R. C., Hotz, S. B., & Birkett, N. J. (2000). Social support and the theory of planned behavior in the exercise domain. *American Journal of Health Behavior*, 24(4), 300-308.
- Craig, C. L., Marshall, A. L., Sjoström, M., Bauman, A. E., Booth, M. L., & Ainsworth, B. E., et al. (2003). International physical activity questionnaire: 12-country reliability and validity. *Medicine and Science in Sports and Exercise*, 35(8), 1381-1395.
- Csikszentmihalyi, M. (1975). *Beyond boredom and anxiety*. San Francisco: Jossey-Bass.
- Csikszentmihalyi, M. (1997). *Finding flow: The psychology of engagement with everyday life*. New York, NY: Basic Books.
- Csikszentmihalyi, M. (1988). The flow experience and its significance for human psychology. In M. Csikszentmihalyi & I. S. Csikszentmihalyi (Eds.), *Optimal experience: Psychological studies of flow in consciousness* (pp. 15-35). New York: Cambridge University Press.
- Csikszentmihalyi, M., & Csikszentmihalyi, I. S. (Eds.). (1988). *Optimal experience: Psychological studies of flow in consciousness*. New York: Cambridge University Press.
- Csikszentmihalyi, M., & Nakamura, J. (1989). The dynamics of intrinsic motivation: A study of adolescents. In R. Ames & C. Ames (Eds.), *Handbook of motivation theory and research*, vol. 3 (pp. 45-71). New York: Academic Press.
- Duncan, S. C., Duncan, T. E., & Strycker, L. A. (2005). Sources and types of social support in youth physical activity. *Health Psychology*, 24(1), 3-10.
- Dunn, A. L., Marcus, B. H., Kampert, J. B., Garcia, M. E., Kohl, H. W., III, & Blair, S. N. (1997). Reduction in cardiovascular disease risk factors: 6-month results from project active. *Preventive Medicine*, 26(6), 883-892.
- Ellis, G. D., Voelkl, J. E., & Morris, C. (1994). Measurement and analysis issues with explanation of variance in daily experience using the flow model. *Journal of Leisure Research*, 26(4), 337-356.
- Fahrenwald, N. L., Atwood, J. R., & Johnson, D. R. (2005). Mediator analysis of moms on the move. *Western Journal of Nursing Research*, 27(3), 271-291.
- Fisher, K. J., & Li, F. (2004). A community-based walking trial to improve neighborhood quality of life in older adults: A multilevel analysis. *Annals of Behavioral Medicine*, 28(3), 186-194.
- Flora, J., & Segrin, C. (1998). Joint leisure time in friend and romantic relationships: The role of activity type, social skills and positivity. *Journal of Social and Personal Relationships*, 15, 711-718.
- Frederick, C. J., Havitz, M. E., & Shaw, S. M. (1994). Social comparison in aerobic exercise classes: Propositions for analysing motives and participation. *Leisure Sciences*, 16, 161-176.
- Giles-Corti, B., & Donovan, R. (2002). The relative influence of individual, social and physical environment determinants of physical activity. *Social Science and Medicine*, 54, 1793-1812.
- House, J. S., & Kahn, R. L. (1985). Measures and concepts of social support. In S. Cohen & S. L. Syme (Eds.), *Social support and health*. Orlando, FL: Academic.
- Havitz, M. E., & Dimanche, F. (1997). Leisure involvement revisited: Conceptual conundrums and measurement advances. *Journal of Leisure Research*, 29, 245-278.
- Havitz, M. E., & Mannell, R. C. (2005). Enduring involvement, situational involvement, and flow in leisure and non-leisure activities. *Journal of Leisure Research*, 37, 152-177.
- Iso-Ahola, S. E., & Park, C. J. (1996). Leisure-related social support and self-determination as buffers of stress-illness relationship. *Journal of Leisure Research*, 28, 169-187.
- Jackson, S. A., & Eklund, R. C. (2002). Assessing flow in physical activity: The flow state scale and dispositional flow scale. *Journal of Sport and Exercise Psychology*, 24, 133-150.

- Kahn, E. B., Ramsey, L. T., Brownson, R. C., Heath, G. W., Howze, E. H., & Powell, K. E. et al. (2002). The effectiveness of interventions to increase physical activity: A systematic review. *American Journal of Preventive Medicine*, 22(Suppl4), 73-106.
- Kleiber, D.A. (2000). The neglect of relaxation. *Journal of Leisure Research*, 32, 82-86.
- Kyle, G., & Chick, G. (2002). The social nature of leisure involvement. *Journal of Leisure Research*, 34, 426-448.
- Larson, R., Mannell, R., & Zuzanek, J. (1986). Daily well-being of older adults with friends and family. *Psychology and Aging*, 1, 117-126.
- Leckey, P. J., & Mannell, R. C. (2000). Confidence in personality impressions of others in leisure and work contexts: The role of implicit theories of leisure as expressive behavior. *Leisure/Loisir*, 24, 279-298.
- Leslie, E., Owen, N., Salmon, J., Bauman, A., & Sallis, J. F. (1999). Insufficiently active Australian college students: Perceived personal, social, and environmental influences. *Preventive Medicine*, 28(1), 20-27.
- Mannell, R. C., & Bradley, W. (1986). Does greater freedom always lead to greater leisure? Testing a person x environment model of freedom and leisure. *Journal of Leisure Research*, 18, 215-230.
- Mannell, R. C., Kaczynski, A. T., & Aronson, R. M. (2005). Adolescent participation and flow in physically active leisure and electronic media activities: Testing the displacement hypothesis. *Society and Leisure*, 28, 653-675.
- Mannell, R. C., & Kleiber, D. A. (1997). *A social psychology of leisure*. State College, PA: Venture Publishing, Inc.
- Massimini, F., & Carli, M. (1988). The systematic assessment of flow in daily experience. In M. Csikszentmihalyi & I. S. Csikszentmihalyi (Eds.), *Optimal experience: Psychological studies of flow in consciousness* (pp. 266-287). New York: Cambridge University Press.
- Massimini, F., Csikszentmihalyi, M., & Carli, M. (1987). The monitoring of optimal experience: A tool for psychiatric rehabilitation. *Journal of Nervous and Mental Disease*, 175, 545-549.
- Munson, M. J., & McQuarrie, E. F. (1987). The factorial and predictive validities of a revised measure of Zaichkowsky's personal involvement inventory. *Educational and Psychological Measurement*, 47, 773-782.
- Naylor, M. (2006). *Exploration of situational involvement among hockey enthusiasts*. Unpublished Master's Thesis, University of Waterloo, Waterloo, Ontario, Canada.
- Okun, M. A., Ruehlman, L., Karoly, P., Lutz, R., Fairholme, C., & Schaub, R. (2003). Social support and social norms: Do both contribute to predicting leisure time exercise? *American Journal of Health Behavior*, 27(5), 493-507.
- Ortega-Smith, E., Payne, L. L., & Godbey, G. (2003). Physical and psychosocial characteristics of older adults who participate in a community-based exercise program. *Journal of Aging and Physical Activity*, 11(4), 516-531.
- Peterson, J. A., Yates, B. C., Atwood, J. R., & Hertzog, M. (2005). Effects of a physical activity intervention for women. *Western Journal of Nursing Research*, 27(1), 93-110.
- Pritchard, M. P., & Brunson III, W. A., (2001, May). Understanding spectator involvement: How do enduring involvement and situational involvement stimulate involvement response? In *Abstracts, 16th Annual Conference North American Society for Sport Management*, (p. 67-68). Virginia Beach, VA.
- Richins, M. L., Bloch, P. H., & McQuarrie, E. F. (1992). How enduring and situational involvement combine to create involvement responses. *Journal of Consumer Psychology*, 1(2), 143-153.
- Rovniak, L. S., Anderson, E. S., Winett, R. A., & Stephens, R. S. (2002). Social cognitive determinants of physical activity in young adults: A prospective structural equation analysis. *Annals of Behavioral Medicine*, 24(2), 149-156.
- Sallis, J. F., Hovell, M. F., Hofstetter, C. R., Faucher, P., Elder, J. P., & Blanchard, J. et al. (1989). A multivariate study of determinants of vigorous exercise in a community sample. *Preventive Medicine*, 18(1), 20-34.

- Sallis, J. F., Kraft, M. K., & Linton, L. (2002). **How the environment shapes physical activity: A transdisciplinary research agenda.** *American Journal of Preventive Medicine*, 22(3), 208.
- Sallis, J. F., & Owen, N. (1999). *Physical activity and behavioral medicine*. Thousand Oaks, CA: Sage Publications.
- Sherif, M., & Cantril, H. (1947). *The psychology of ego involvements, social attitudes and identifications*. New York: Wiley.
- Stahl, T., Rutten, A., Nutbeam, D., Bauman, A., Kannas, L., & Abel, T., et al. (2001). The importance of the social environment for physically active lifestyles - results from an international study. *Social Science & Medicine*, 52, 1-10.
- Stein, G. L., Kimiecik, J. C., Daniels, J., & Jackson, S. (1995). Psychological antecedents of flow in recreational sport. *Personality and Social Psychology Bulletin*, 21(2), 125-135.
- Taylor, W.C., Baranowski, T., & Sallis, J.F. (1994). Family determinants of childhood physical activity: A social-cognitive model. In R.K. Dishman (Ed.), *Advances in exercise adherence* (pp. 319-342). Champaign, IL: Human Kinetics.
- Toobert, D. J., Glasgow, R. E., Nettekoven, L. A., & Brown, J. E. (1998). Behavioral and psychosocial effects of intensive lifestyle management for women with coronary heart disease. *Patient Education and Counseling*, 35(3), 177-188.
- Trost, S. G., Neville, O., Bauman, A. E., Sallis, J. E., & Brown, W. (2002). Correlates of adults' participation in physical activity: Review and update. *Medicine and Science in Sports and Exercise*, 34(12), 1996-2001.
- Voelkl, J. E., & Ellis, G. D. (1998). Measuring flow experiences in daily life: An examination of the items used to measure challenge and skill. *Journal of Leisure Research*, 30, 380-389.
- Watkins, M., & Bond, C. (2007). Ways of experiencing leisure. *Leisure Sciences*, 29, 287-307.
- Webster, J., Trevino, L.K., & Ryan, L. (1993). The dimensionality and correlates of flow in human computer interactions. *Computers in Human Behavior*, 9 (4), 411-26.