

# Flow Experience in the Daily Lives of Older Adults: An Analysis of the Interaction between Flow, Individual Differences, Serious Leisure, Location, and Social Context

Jinmoo Heo,<sup>1</sup> Youngkhil Lee,<sup>2</sup> Paul M. Pedersen,<sup>3</sup> and Bryan P. McCormick<sup>4</sup>

---

## RÉSUMÉ

Cette étude a examiné comment les loisirs sérieux, les différences individuelles, le contexte social et l'emplacement contribuent aux expériences de flux – un état psychologique intense – dans la vie quotidienne des adultes plus âgés. La Méthode d'échantillonnage a été utilisée avec 19 adultes plus âgés dans une ville du Midwest des États-Unis. L'expérience de flux a été la mesure des résultats, et les données ont été analysées à l'aide de la modélisation linéaire hiérarchique. Les résultats ont indiqué que la localité et le statut de l'emploi ont influencé l'expérience de flux des sujets. En outre, les conclusions ont révélé que la retraite était négativement liée à la rencontre de flux, et qu'il y avait une association significative entre le domicile et l'expérience de flux. Les résultats de cette étude améliorent la compréhension des expériences de flux dans la vie quotidienne des adultes plus âgés.

## ABSTRACT

This study examined how serious leisure, individual differences, social context, and location contribute to older adults' experiences of flow – an intense psychological state – in their daily lives. The Experience Sampling Method was used with 19 older adults in a Midwestern city in the United States. Experience of flow was the outcome measure, and the data were analyzed using hierarchical linear modeling. Results indicated that location and employment status influenced the subjects' flow experience. Furthermore, the findings revealed that retirement was negatively related to experiencing flow, and there was a significant association between home and the flow experience. The results of this study enhance the understanding of flow experiences in the everyday lives of older adults.

---

<sup>1</sup> Department of Tourism, Conventions, and Event Management, Indiana University–Indianapolis

<sup>2</sup> Department of Health, Physical Education, Recreation, Dance & Sport, Calvin College

<sup>3</sup> Department of Kinesiology, Indiana University – Bloomington

<sup>4</sup> Department of Recreation, Park, and Tourism Studies, Indiana University – Bloomington

Manuscript received: / manuscrit reçu : 12/09/08

Manuscript accepted: / manuscrit accepté : 25/01/10

**Mots clés :** loisirs sérieux, flux, adultes plus âgés

**Keywords:** serious leisure, flow, older adults

Correspondence and requests for offprints should be sent to / La correspondance et les demandes de tirés-à-part doivent être adressées à:

Jinmoo Heo, Ph.D.

Department of Tourism, Conventions, and Event Management

Indiana University–Indianapolis

901 W. New York St. PE258G

Indianapolis, IN 46202

(jheo@indiana.edu)

---

The role of leisure often becomes an increasingly important part of older adults' lives. Numerous research studies have revealed the beneficial aspects of leisure experiences as people advance in years.

These benefits include improvements in physical and mental health (Russell, 1990; Yau & Packer, 2002), life satisfaction (Hawkins, Foose, & Binkley, 2004), and social bonding (Burch & Hamilton-Smith,

1991). While leisure experiences in general might be beneficial, some extraordinary leisure experiences that accompany high levels of intensity, involvement, and commitment can bring more merit to individuals than casual leisure pursuits (Stebbins, 2007). *Flow* and *serious leisure* are two such examples of extraordinary experiences.

Flow is characterized as an intense psychological state when people participate in activities in which the challenges and skills involved are high and balanced (Csikszentmihalyi, 1990). Serious leisure, on the other hand, is characterized by devotion, high investment, and commitment (Kelly & Freysinger, 2000). Both of these extraordinary leisure experiences, flow and serious leisure, have each been studied in the field of leisure research for more than 20 years.

### *Flow*

Flow is experienced when individuals exhibit an intense psychological state through their participation in certain challenging activities. This concept, which clarifies how and why an activity becomes meaningful, was first established more than 30 years ago. Csikszentmihalyi (1975) noted that flow is a quality of experience in which people are so intensely involved in an activity that nothing else seems to matter. In his study of dancers, rock climbers, and chess players, Csikszentmihalyi found that the subjects were somehow rigorously absorbed in their activities, and often lost track of time and consciousness of their surroundings. It was soon discovered, however, that these individuals were not the only leisure participants able to experience flow. As Csikszentmihalyi, Larson, and Prescott (1977) suggested, flow can occur anywhere, and there exists a variety of activities that generate flow.

As noted by Csikszentmihalyi (1975), the state of equal match – a balance – between challenge and skills can be an indicator of the flow experience. Csikszentmihalyi conceptualized flow experiences as encompassing situations when an individual's low level of challenge was matched with a low level of skills as well as when an individual's high level of challenge was matched with a high level of skill. With regard to balancing challenge and skill, older adults have shown unique patterns in their daily lives. In a study of everyday activity parameters and competence, a group of scholars (Pushkar, Arbuckle, Conway, Chaikelson, & Maag, 1997) found that older adults normally rated their activities as being fairly easy. Additionally, they discovered that older adults were happiest when they were engaging in activities with a low level of challenge. Contradictory to this finding, O'Brien and Conger (1991) argued that healthy older adults searched for activities that require effort to overcome difficulties, and

the researchers asserted that those activities that place substantial demands on individuals' abilities greatly influence the quality of the experience. The heterogeneity of findings about older adults has led researchers to investigate other potential factors influencing flow experiences.

### *Contextual, Personal, and Location Factors Conducive for Flow*

Although the links between flow outcomes and contextual, personal, and location factors have not been empirically established, the relationship between variables that are somewhat compatible with flow and other factors has been tested. Previous research shows that certain situations might be conducive to the flow experience in the daily lives of older adults. For example, social contexts (e.g., interacting with relatives) may influence the flow experience differently among older adults. Larson, Mannell, and Zuzanek (1986) studied older adults and found that being with friends was more conducive to flow than being with family. Similarly, Privette and Bundrick (1991) stated that interacting with others (i.e., friends, relatives) influenced the flow experience of older adults.

In addition to social context, personal factors have also been found to influence the flow experience in older adults. Although Csikszentmihalyi (1992a) and other scholars (e.g., Carli, Delle Fave, & Massimini, 1988) suggested that the experience of flow is perceived and described in similar ways regardless of age, gender, and social class, the way in which older adults, in particular, experience flow may be an exception. In other words, researchers should consider individual differences (i.e., socio-demographic variables such as age, gender, and retirement status) when studying flow in older adults. In one such study, Han (1992), for example, found that there were gender differences in experiencing flow. Han noted that male participants were likely to experience flow in their leisure pursuits whereas female participants were more likely to experience flow in household activities.

Besides social network and individual differences, locations have an effect on the quality of the flow experience (Csikszentmihalyi, 1997). In the aforementioned study by Han (1992), the home was an important physical environment in which older adults frequently experienced flow. Han suggested that domestic activities (e.g., household chores) could lead older adults into deeply involved experiences that produce flow. Furthermore, different locations within a home may have different effects on the psychological state of older adults. Csikszentmihalyi noted that good-mood states for women and men were to be found in the kitchen and basement, respectively. Csikszentmihalyi added

that there was little knowledge about the influence of location, and called for studies to examine how the environment affects individuals. Although some of these research studies did not directly measure the relationship between the flow experience and contextual factors, such a link could be suggested because positive emotions (e.g., enjoyment, pleasurable feelings) are considered compatible with flow experience.

#### *Activity Factors Related to Flow*

In addition to social context, personal differences, and location, some studies have found that engagement in certain leisure activities might be conducive to experiencing flow. Mannell (1993) and Stebbins (1992) noted that when individuals commit to a certain activity, they are likely to experience flow. For example, the subjects in one study (Mannell, Zuzanek, & Larson, 1988) reported experiencing flow when they were engaging in extrinsically motivated activities while the subjects in another study (Yaffey, 1991) experienced flow when they participated in activities that required physical commitment. Serious leisure requires high levels of commitment, and some researchers (Kelly & Freysinger, 2000; Stebbins, 2001) have conceptualized that individuals may experience flow when they are engaged in serious leisure. In serious leisure, participants are satisfied through gaining personal and social rewards such as self-actualization, skill development, linking with other serious leisure participants, and group accomplishment (Stebbins, 2001). Based on studies of jazz musicians and barbershop singers, Stebbins' findings revealed a close relationship between serious leisure activities and flow experiences.

Six experiential qualities represent the essential nature of serious leisure (Stebbins, 1992). These qualities are (a) perseverance, (b) significant effort, (c) career development, (d) durable benefits, (e) strong identification, and (f) unique ethos. Furthermore, there are both personal and social benefits associated with serious leisure (cf., Stebbins, 2004, 2007). Personal benefits in serious leisure include (a) self-actualization, (b) self-expression, (c) self-image, (d) self-gratification, (e) regeneration, (f) personal enrichment, and (g) financial returns. On the other hand, social attraction, group accomplishment, and the development of the group are some of the social benefits affiliated with serious leisure. Research in this area has investigated various demographic segments, including those individuals in the aging population segment (e.g., Brown, McGuire, & Voelkl, 2008). Studies that examined older adults discovered several benefits associated with participation in serious leisure activities. For instance, Siegenthaler and O'Dell (2003) discovered that older adults who exhibited a high commitment to golf valued the development of social interaction and friendship through

playing golf. Although social benefits through the activity were highlighted in the study, older adults in such serious leisure activities are likely to experience a feeling of competence, which would generate flow.

As can be gleaned from the literature, older adults' flow experience is related to several factors such as individual differences, social context, location, and commitment to activity. Although these factors have been studied across various disciplines, a general consensus is that additional research is needed to document the relationships.

#### *Purpose of the Study*

Mannell (1993) empirically tested the link between serious leisure and flow in a study of the daily lives of older adults. The relationship between high-investment activities and the experience of flow was identified, and it was confirmed that older adults who felt some commitment or obligation were likely to experience flow. Although Mannell's study contributed to the body of knowledge by examining the relationship between qualities of flow experiences, the role of situational characteristics was not clearly identified. Furthermore, while previous studies (e.g., Goff, Fick, & Oppliger, 1997; Major, 2001) of serious leisure and flow have examined the between-individual differences, within-individual fluctuations have yet to be investigated.

Therefore, the study we discuss in this article has extended the previous research on older adults' daily lives by investigating the importance of context for predicting reported flow states. In the literature discussed thus far, arguments have been made that certain situations and certain individual differences are conducive to flow experience in the daily lives of older adults (Han, 1992; Privette & Bundrick, 1991). Studies have also postulated that experiential characteristics such as serious leisure are likely to generate flow (Hamilton-Smith, 1992; Stebbins, 2001).

Although such arguments are plausible, no investigations have been found that either support or reject them. In fact, while there exists a number of studies that have examined the relationship between situational characteristics and the experience of flow (e.g., Larson et al., 1986), the influence of serious leisure on flow is still unclear. Furthermore, retirement is not only an objective life course transition but also a subjective developmental transformation that can affect quality of experience of older adults. Despite the critical importance of the retirement stage, little research has addressed the impact of retirement on quality of experience. Therefore, in order to address the limited research devoted to this area, the purpose of our study was to investigate how serious leisure, individual differences, social context, and location

contribute to the flow experience in the daily lives of older adults.

## Methods

### Sample

The study participants ranged from 62 to 85 years of age. This sample consisted of 19 older adults (6 males and 13 females, mean age = 72,  $SD = 6.0$ ) who were recruited from a local agency for the aging in a Midwestern city in the United States. This nonprofit agency provides services to people in the region who are 50 years of age and older; however, in the present study only those who were 60 years of age or older were included. At the time of data collection, participants in this study were involved in a variety of programs such as computer tutoring sessions, arts and humanities classes, fitness pursuits, intergenerational endeavors, and volunteer opportunities. The sample for this study was drawn from individuals who were enrolled in one of those programs. Physical disabilities were not a limitation for participation. Participants in this study were physically independent and relatively healthy because they were able to drive themselves to the agency and participate in the activity classes.

With regard to their level of education, 53 per cent had up to 12 years of formal education and 42 per cent had more than 12 years of education. The majority of participants were married ( $n = 15$ ; 79%). The rest of the participants were separated ( $n = 4$ ; 21%). Most of the participants were retired ( $n = 17$ ; 89%). With regard to living arrangements, 84 per cent of the participants noted they lived with others, and three participants indicated they lived alone.

### Procedures

The research tool of the present study was the Experience Sampling Method (ESM), which was developed by Csikszentmihalyi et al. (1977). This tool has been designed to collect data about participants' feelings in naturally occurring situations. One of the advantages of using the ESM is that the participants can, through the use of a signal, record ongoing events and their immediate responses to these events. Due to the short time interval between the signal and the subject's response, the ESM helps minimize memory biases that often come from retrospective recall instruments (Scollon, Kim-Prieto, & Diener, 2003). As Borrell (1998) reported, the ESM has proven to be a successful tool for capturing everyday experiences among older adults. Scollon et al. also noted that ESM permits researchers to investigate both between-individual and within-individual experiences. It is important to distinguish between these two levels because they are independent

of each other. In other words, within-person variability can be different from between-person variability in both flow and its concomitants.

However, there are a few disadvantages of using ESM. Alarms can be disruptive in the daily lives of the subjects. People sitting in church, engaged in meetings, or attending to other important activities and errands can be annoyed by the beeps. In addition to the noise disturbance, the ESM usually has an extensive number of questions. Participants were required to fill out a short form for each beep, and they answered around 1,000 questions during seven days. Because of the disruptiveness of the alarms and the extensive questioning, in past studies it has not been unusual for some participants to drop out in the middle of the studies. Across a number of studies, Cronbach's alpha values for numerous scales in ESM studies have been reported in an acceptable range (between .70 to .90; e.g., Diener, Smith, & Fujita, 1995; Eid & Diener, 1999).

In this study, participants carried pre-programmed wristwatches for seven consecutive days and completed a self-report form whenever they received the alarm from the device. These wristwatches were programmed to beep seven times a day. Participants received the randomized signals between 9:00 a.m. and 9:00 p.m. Participants were assured that the signals would occur at random times, with the restriction that two signals would not beep fewer than 30 minutes apart and not more than two hours apart. In order to prevent memory decay when responding to the signals, participants were asked to fill out only those questionnaires that could be completed within 15 minutes of signaling.

### Instrumentation

The Experience Sampling Form (ESF) included a self-report questionnaire that was designed to capture the participants' experiences when they were paged. The ESF contained several open-ended questions regarding what the participants were thinking when they were paged, the location of the participants, the activities in which the participants were engaged, and the main activity in which the participants were involved. In order to measure the participants' perceptions of the situations, a number of Likert-type statements and semantic differential items (e.g., happy-sad, lonely-social) were used in the ESF.

*Flow.* Levels of challenge and skill have been broadly used as indicators of flow (Moneta, 2004). When investigating the phenomenon of flow in everyday settings (i.e., flow experiences between work and leisure), researchers could – as long as they carefully provided an appropriate operational definition of flow – use perceived challenges and skills as indicators of

flow. Although using the balance between perceived challenge of an activity and skill level can be a restricted view of flow and therefore warrants caution (Csikszentmihalyi, 1992b), this measure is still known as an important precondition for the flow experience (Whalen, 1997).

To investigate the experience of flow, we focused on two of the variables measured by the ESF: the perceived challenge of the activity and the perceived skills in the activity. These were revealed by answers to the questions, "How difficult was the activity?" and "How well were you doing the activity?" and were measured using a five-point Likert scale for challenge (1 = "very easy" to 5 = "very difficult") and for skills (1 = "not well" to 5 = "very well") respectively.

The operational definition of flow was determined using raw scores for challenge and skill. A determination of flow state was made whenever levels of skill and levels of challenge were above the mid-point for both skill and challenge. Scores of three and higher on perceived challenge and skill were used to calculate a dichotomous variable. This was used to assess flow and non-flow states. In other words, the situations when the participants experienced medium-to-high challenge (i.e., level 3, 4, or 5) matched with medium-to-high skill (i.e., level 3, 4, or 5) were considered flow states in this study. There were 25 possible combinations of challenge and skill, and nine situations were considered flow (see Table 1). Answers on perceived challenge and perceived skill were cross-tabulated.

**Table 1: Descriptive statistics of challenge, skill, and serious leisure**

Subject ID	Challenge		Skill		Serious Leisure	
	Mean	SD	Mean	SD	Mean	SD
1	1.59	.92	4.38	1.03	12.14	2.40
2	1.55	.95	4.52	.92	12.81	2.63
3	1.98	.91	3.69	1.14	12.31	2.04
4	2.15	.75	3.72	.82	13.51	1.65
5	1.24	.43	4.52	.87	12.84	1.62
6	1.90	.46	4.14	.73	12.67	1.46
7	2.18	.75	4.31	.52	13.79	2.00
8	1.38	.77	4.78	.69	15.95	.30
9	2.41	.74	2.78	.85	14.44	1.97
10	1.79	1.16	4.19	.93	12.79	1.77
11	2.32	.94	4.16	.76	9.89	1.85
12	1.58	1.10	4.46	1.03	15.46	1.68
13	1.63	1.19	4.23	.84	13.58	2.32
14	1.74	.81	4.59	.57	15.04	1.48
15	2.11	.31	3.96	.20	12.02	.14
16	1.98	.75	3.73	1.23	14.67	1.86
17	1.44	1.02	4.23	1.08	12.77	3.02
18	1.84	1.19	4.16	.92	13.97	1.94
19	1.63	.79	4.39	.80	12.28	2.99

*Serious leisure.* We developed four questions on the basis of previous research in the fields of leisure behaviour (Goff et al., 1997). The constructs of serious leisure were assessed from the following perspectives: extent to which the respondents identified with the chosen activity, respondents' perceptions about how much effort they invested in the activity, and respondents' perceptions about benefits gained through the activity. The following four questions were used to measure serious leisure: (a) "The activity I was doing is very important in describing who I am", (b) "I intend to accomplish this activity", (c) "I regularly train for this activity", and (d) "I believe I have the potential to be good at this activity". These items, which were purported to assess three of the six essential characteristics of serious leisure, were measured using a four-point Likert scale ranging from "strongly agree" (1) to "strongly disagree" (4).

As examined in the aforementioned literature, Stebbins (2001) noted that there are six essential characteristics of serious leisure: perseverance, effort, career development, benefit, unique ethos, and identity. Among these characteristics, strong identification is a particularly important aspect of serious leisure because serious leisure participants tend to strongly identify themselves with the activity. Stebbins also suggested that serious leisure participants have tendencies to speak frequently and proudly about them to other people. Therefore, this characteristic of serious leisure was determined by questions ("items") regarding strong personal identification (e.g., "The activity I was doing is very important in describing who I am"). This item shows similarity with "identity" items (e.g., "Others recognize that I identify with ...", and "I am often recognized as one devoted to ...") in Gould, Moore, McGuire, and Stebbins' (2008) Serious Leisure Inventory Measure (SLIM).

The second identity item measured accomplishment that encompasses overall personal benefit (i.e., "I intend to accomplish this activity"). This item reflects personal benefits such as the expression of abilities and self-gratification that were found in Gould et al.'s SLIM (i.e., "My knowledge of ... is evident when participating," and "My ... experiences are deeply gratifying"). The third identity item related to significant personal effort to acquire and develop special knowledge, abilities, and skills (i.e., "I invest significant effort for this activity"). Self-actualization was assessed using the fourth identity item (i.e., "I believe I have potential to be good at this activity"), which measured the extent to which unique skills, abilities, and knowledge were applied and developed in serious pursuits.

While there are six distinguishing qualities of serious leisure, three of the qualities (i.e., perseverance, career

development, and unique ethos) were not included because of an ESM limitation. As we have discussed, ESM provides immediate feelings and responses at a given moment, and this does not allow researchers to assess turning points or stages of achievement. In addition, *unique ethos* refers to shared attitudes, practices, values, and goals of the social world (Stebbins, 2007). Examining the community characteristics was restricted because ESM focuses on individual responses.

*Social context.* The question “Who were you with?” was used to determine the categories of social context. From this question, the responses were collapsed into the two categories and later coded into either 1 (alone) or 0 (with others).

*Location.* The question “Where were you?” was used to identify sub-categories of location. The responses were coded into two categories: (1) home and (0) outside the home. To ensure the accuracy of coding, a researcher was employed who also coded the responses. The inter-rater reliability for the location item was .86 indicating a high agreement across the investigators and researcher (Debats, Drost, & Hansen, 1995).

### Data Analysis

We analyzed the data in the present study using *hierarchical linear modeling* (HLM), a statistical technique developed by Raudenbush and Bryk (2002). Data were collected both at the between-person levels (i.e., age, gender, retirement status) and at the within-person levels (i.e., multiple measurements of serious leisure, location, social contexts in everyday life). The data in our study represented over 700 repeated measures of experiences that were nested within 19 older adults. By using GPower 3.0.10, we conducted a power analysis and found that 19 is an adequate number for between-person level, and that 700 for within-person level is sufficient for analysis. With the multi-level data, it is inappropriate to disaggregate between-person level variables and enter them into a regression equation because it would result in ignoring within-person variance (Raudenbush & Bryk). HLM is the appropriate method to analyze data from a mixed-models design because each ESF is nested within a different person, and the study required the use of a linear regression model for multi-level data. HLM lets researchers partition variances into within-person and between-persons components so that the data can be considered from multiple levels. Through partitioning the variance, the model’s explanatory power can be enhanced.

HLM has often been used in the education field when researchers have analyzed the effects of student and school characteristics (Bryk & Raudenbush, 1992). Classrooms or schools have been used as higher-level

data because students are nested within classrooms and schools. For example, when students are nested in schools, the effects of schools must be accounted for because schools have potential effects on the outcome of the study. The HLM statistical analysis technique also can be applied to recreational and leisure settings (e.g., Sibthorp, Witter, Wells, Ellis, & Voelkl, 2004). A study by Sibthorp et al. used adolescents enrolled in three weeks of sailing and scuba diving courses (20 different courses) and two program types. A three-level HLM design was used because the variance for within-participants was at the lowest level, and the variances between courses and variance between types of program were at the higher levels.

Data were considered hierarchical in the present study because experiences were nested within individuals. Thus, HLM allows for the examination of both within-person and between-person effects on an individual-level dependent variable. One of the major advantages of applying HLM was that it allowed for controlling within-person differences for serious leisure and social contexts. In this study, rather than studying the main effects of person characteristics, we were interested in examining within-person fluctuation. Such an approach is similar to most ecological momentary assessment investigations (Schwartz & Stone, 1998). This procedure enhanced the reliability of flow associated with serious leisure, location, and social contexts.

In our study, we used the HLM 6.02 program (Raudenbush, Bryk, Cheong, Congdon, & Toit, 2004) to address the relationship among a number of self-report variables and individual differences in flow experience. Because the outcome measure in this study was dichotomous (i.e., flow vs. non-flow), we specified a non-linear Bernoulli model (Bryk & Raudenbush, 1992). The primary analyses focused on the prediction of flow experience. Specifically, serious leisure, social context (i.e., with others vs. alone), and location (i.e., home and outside the home) were level 1 predictors. Level 2 predictors were the participants’ age, gender, and employment status (i.e., retired vs. employed). Dummy variables were created because two level 1 predictors (social context and location) were categorical variables. Social context was represented by a single dummy variable (1 = alone, 0 = with others), and location was also represented by a single dummy variable (1 = home, 0 = outside home). The components of the following model illustrate the structure of the analysis.

### Level 1 Model

$$\begin{aligned} \text{Logit}(Y_{ij} = \log[P_{ij}/(1 - P_{ij})]) = & \beta_{00} + \beta_{01} * (\text{Location}) \\ & + \beta_{02} * (\text{Serious Leisure}) \\ & + \beta_{03} * (\text{Social Context}) \end{aligned}$$

## Level 2 Model

$$\beta_{00} = \gamma_{00} + \gamma_{01} * (\text{Age})_j + \gamma_{02} * (\text{Gender}) + \gamma_{03} * (\text{Retirement}) + \gamma_{0j}$$

## Results

### Preliminary Analyses

The participants ( $N = 19$ ) in the present study were asked to fill out the ESF seven times a day for seven consecutive days. Therefore, each participant had the potential to submit a total of 49 ESM reports over that one-week period. Respondents completed 779 (83.6%) ESF forms. Of the submissions, 15 reports were discarded because they were not completed within the stated 15-minute time period. Therefore, 764 reports were used in the analysis for a response rate of 82.06 per cent.

*Descriptive statistics.* The data for one of the predictor variables (i.e., serious leisure) as well as the challenge and skill variables by each subject are shown in Table 1. When aggregated across all scores, the mean score for serious leisure was 13.37 ( $SD = 2.36$ ), and the score ranged from 9.89 to 15.95 for the 19 respondents. Early research in this area found that individuals experience flow when perceived challenge and skill are balanced (Csikszentmihalyi, 1975). Table 2 displays mean scores of challenge (which ranged from 1.16 to 2.41) and skill (which ranged from 2.78 to 4.78). For challenge, the aggregated mean score across the participants was 1.81 ( $SD = .32$ ). For skill level, the aggregated mean score across the participants was 4.15 ( $SD = .44$ ). As the mean scores reveal, for the most part the participants rated *challenge* low while they rated *skill level* relatively high. Most participants reported that they faced low challenge levels and high skill levels throughout their engagement in the various activities during the study. Therefore, the majority of their answers were placed in the upper-right quadrant of Table 2. Accordingly, 12.9 per cent of the total observations were considered flow

state (shaded values indicate flow state). Of those flow states, participants reported that 48 per cent of their flow experiences were generated through recreation and leisure activities such as club activities, playing sports, and entertainment. Doing housework or caring for household objects accounted for another 36 per cent of that captured flow experience. Among the recreation and leisure activity, the majority (66%) involved relaxing or short-lived pleasurable activities such as listening to music, watching television, and reading.

*Reliability analyses.* Cronbach's alpha of the serious leisure items was .90. Based on a reliability analysis, the removal of any of the four remaining items should result in a reduction in alpha reliability. Cronbach's alpha values on respective serious leisure item were as follows: .80 ("the activity I was doing is very important describing who I am"); .74 ("I intend to accomplish this activity"); .81 ("I invest significant effort for this activity"); and .81 ("I believe I have potential to be good at this activity"). This internal consistency was based on aggregated responses of 19 participants, and did not account for within-person variability.

*Intercorrelations.* The intercorrelations among the predictors as well as the challenge and skill variables are shown in Table 3. Data points represent the mean across seven days for each individual. Correlation analysis shows all relationships are statistically significant ( $p < .05$ ). Because skill was greater than challenge in most instances, perceived challenge was negatively correlated with skill level.

### Hierarchical Linear Modeling

*Null model.* Further analyses were conducted using HLM in order to predict reports of flow from experience variables (i.e., serious leisure, social context, location) and individual difference variables (i.e., age, gender, retirement). Two steps were taken in order to find out if there was a between-individual variance in flow. First, a null model was estimated. In this model, no predictors were included. This model is designed to

**Table 2: Occurrence of flow experience**

		How well were you doing the activity?				
		1 (not well)	2	3	4	5 (very well)
How difficult was the activity?	1 (very easy)	.8%	.4%	.3%	6.3%	35.0%
	2	0%	4.0%	2.5%	26.3%	7.8%
	3	0%	.8%	5.7%	3.5%	.5%
	4	.3%	1.6%	.8%	1.4%	.1%
	5 (very difficult)	1.4%	.8%	.8%	0%	.1%

**Note:** The shaded cells indicate the cells that were conceptualized as flow.

**Table 3: Intercorrelations of predictor and dependent variables**

Variables	Mean	SD	Challenge	Skill	Serious Leisure
1. Challenge	1.81	.32	–	–.62* (–.98~.31)	–.18* (–.85~.27)
2. Skill	4.15	.44		–	.15* (–.50~.88)
3. Serious Leisure	13.31	1.42			–

**Note:** The correlation coefficients in the top part of each cell are aggregate-level correlations, taken to the between-person level. Each observation is the mean across the seven days for each individual. Therefore, within-person level variances are ignored in these correlations. The correlation coefficients in the bottom part of each cell (the ones in the parentheses) indicate ranges taken from each individual.

\* $p < .01$

estimate the size of the variation in the average probability of experiencing flow. As Table 4 indicates, significant chi-square values show that there was a considerable variation in flow across individuals. Additionally, the reliability coefficient for flow is moderate, which confirms that the model was appropriate (Huebner, 2005).

*Full model.* A full model was estimated in the second step. This model was estimated at two levels. Level 1 (within-individual) included experience variables. This level estimated the effect of within-individual change on the odds of flow. Level 2 (between-individual) included individual difference variables, and the results of the model are presented in Table 5.

From the HLM analysis, we found that retirement was negatively related to experiencing flow. Retirement significantly reduced the experience of flow ( $\gamma = -.96$ ,  $p < .05$ ), and it decreased the odds of flow by 62 per cent. In other words, participants who were retired were less likely to experience flow than those who were not retired.

The location variable was significantly associated with the dependent measure. There was a significant association between home and indication of flow experience ( $\gamma = .49$ ,  $p < .05$ ). These findings reveal that older adults in this study were likely to experience flow when they were at home. The odds of experiencing flow increased by 64 per cent when the participants were at home. From the analysis, it was found that being employed and being at home increased the likelihood that older adults would experience flow in their daily lives. Other level 1 variables (i.e., social context, serious leisure) as

**Table 4: Variance components for random effects**

	Reliability	Variance	$\chi^2$
Flow			
Intercept	.70	.73	69.98*

\*  $p < .01$

well as age and gender were not significantly associated with the dependent measure.

## Discussion

The purpose of our study was to investigate how serious leisure, individual difference, social context, and location contribute to the experience of flow in the daily lives of older adults. Although this study did not discover a significant relationship between serious leisure and flow, the study results did suggest that other factors such as location and individual employment status (i.e., retirement) influenced the flow experience in older adults.

The non-significant relationship between serious leisure and flow in this study warrants discussion. In theory, high investment activity, intense involvement, and personal commitment, all of which are central characteristics of serious leisure, should generate flow. The results of this study, however, are contrary to the conceptualization by Kelly and Freysinger (2000) that serious leisure generates flow. Explanations for this vary.

From a theoretical perspective, the findings of this study point to a counter-intuitive understanding of flow and serious leisure. Interestingly, participants reported that more than half of their flow experience was generated

**Table 5: Final estimation of fixed effects for flow**

	Coefficient	SE	Odds
<b>Level 1</b>			
Social Context	.12	.23	1.13
Serious Leisure	–.05	.07	.95
Location	.49*	.22	1.64
<b>Level 2</b>			
Intercept	–1.76**	.47	–
Gender	.17	.42	1.18
Age	.00	.02	1.00
Retirement	–.96*	.43	.38

\* $p < .05$ , \*\* $p < .01$

through doing housework, as well as other relaxing or short-lived pleasurable activities (e.g., watching television, reading, and listening to music). These activities were categorized as casual leisure by Stebbins (2001). If so, does casual leisure contribute to flow? Stebbins (2007) suggested that experiencing flow is not restricted to serious leisure participation because the enjoyment component in casual leisure is as important as it is in serious leisure. Stebbins noted that casual leisure, as opposed to serious leisure, involves immediate, intrinsically rewarding activities that require "little or no special training to enjoy" (p. 58). As Hutchinson and Kleiber (2005) observed, casual leisure could be meaningful to participants because of benefits such as buffering immediate stress, buffering the impact of negative life events, and sustaining coping efforts.

While the ideas from Stebbins (2007) and Hutchinson and Kleiber (2005) are conceptual in nature, Graef (2000) made a similar observation in his empirical study. Graef found that the experience of flow is not limited to structured activities such as artistic performances, playing a game, or occupations. He reported that the trivial activities in everyday life such as watching television and reading fit the original flow model to a limited complexity. These ordinary, unstructured activities are referred to as micro-flow activities, and the notion of micro-flow activities is similar to casual leisure. Therefore, while some researchers (e.g., Stebbins, 2001) have theorized a conceptual relationship between serious leisure and flow, the complexity of flow (i.e., micro-flow or deep flow) should be reconsidered when this relationship is tested. In other words, failure to find such a relationship in the present study suggests that serious leisure may be closely related to deep-flow activities, but serious leisure and micro-flow activities may not be associated with each other. It should also be noted that the majority of the activities that older adults in this study engaged in were not considered deep-flow activities in the first place, and, therefore, an unexpected finding between serious leisure and flow might have been shown.

From this study, it is not known whether unstructured, micro-flow activities accompanied all nine of the flow elements found by Csikszentmihalyi (1990). However, it could be inferred from the present study's data that participants experienced at least some components of flow. Considering the relatively high level of skills that participants indicated towards the activity, it is reasonable to assume that they had a sense of control over the activity in their daily lives. In addition, a closer examination of the data revealed that most of the participants' thoughts (81%) were related to the task when they were engaged in flow-generating activities. This was confirmed by examining the questions "What were you doing" and "What were you thinking". Such

a finding indicates that participants had clear goals regarding the activities, and also demonstrates that they were engaged in the activities that provided them with opportunities to focus.

From a methodological standpoint, the timing of data collection might have made a difference in this study's results pertaining to the relationship between serious leisure and flow. Stebbins (2001) contended that involvement in serious leisure can be influenced by work schedules. He noted that involvement in serious leisure activities "usually takes place during evenings and weekends, which accommodates the conventional nine-to-five, Monday-to-Friday employment schedule" (p. 16). This notion of serious leisure is focused on the general segment of the population which includes people who are not retired and who have a fixed work schedule. Data collection in the present study occurred from 9:00 a.m. to 9:00 p.m. over a one-week period. Considering the number of retired participants ( $n = 17$ ), most of the subjects were not influenced by a conventional work schedule. This time frame is much different from the time frame that Stebbins referred to regarding when serious leisure most often takes place. Upon retirement, a work lifestyle no longer exists among many older adults (Stebbins, 2004). Stebbins proposed that serious leisure can provide a substitute for work for the retired, but it is unknown if older adults upon retirement can experience flow from a work substitute – namely serious leisure.

Furthermore, in order to understand why the experience of flow was negatively related to serious leisure, it is important to note that flow was measured by the perceived challenge and skill levels among the respondents in this study. Perhaps the balance between challenge and ability level did not play an important role in experiencing flow among the individuals in this study. In other words, other dimensions of flow (e.g., sense of control over the activity, distorted sense of time, high degree of concentration) might be better indicators of flow. Although the ratio of challenge and skill has been widely used in flow studies, no evidence exists that average or above-average levels of challenge and skill are required to experience flow. Therefore, it is possible that other dimensions of flow might be more influential than the level of challenge and skills. Perhaps, as suggested by Jones, Hollenhorst, and Perna (2003), it can be argued that multifaceted factors should have been considered to predict flow, and flow as measured by the skill-challenge ratio may not be a by-product of serious leisure among older adults.

Older adults in this study were more likely to experience flow when they were at home as opposed to when they were outside the home. In fact, older adults spent

more than half of their time at home during the week when the study was conducted. A plausible explanation for experiencing flow at home could be related to how older adults value home. As this study demonstrated, home is important to the lives of older people because a significant portion of their time is spent at home.

Swenson (1998) noted that personal attachments to homes influence the mental and physical well-being of older adults. Swenson found that home provided self-esteem, a sense of identity, and a manifestation of control over the environment. Furthermore, one essential characteristic of experiencing flow is being in control of one's life at a certain point in time (Csikszentmihalyi, 1990). Given that older adults may have control over environments at home, it has become a relatively important source of a quality experience, and it could be suggested that being engaged and deeply involved in home activities can be important for older adults.

In addition to the association between location and the experience of flow, the findings of this study indicated that retirement significantly reduced the experience of flow. Csikszentmihalyi (1997) suggested that when individuals are in high challenge and high skill situations on the job, it is likely that flow will occur. Just like playing games or sports, work also encourages concentration and intrinsically rewarding activities. The result is also in accordance with the study by Delle Fave and Massimini (1988) which noted that employment is a continuous source of highly complex challenges and often requires developed skills. The findings of the present study seemed to confirm the notion that employment status influences the flow experience occurrence of older adults (Drentea, 2002).

Unlike previous studies (e.g., Larson et al., 1986; Privette & Bundrick, 1991), this investigation did not find a significant relationship between social context and experience of flow. Given this result, it was intriguing to examine closely the participants' interactions with others in their daily lives. In their study, Larson et al. showed that older adults reported lower levels of optimal experiences when they were with family than when they were with friends. Considering the majority of participants ( $n = 16$ ) were married in the present study, it would not be surprising that these older adults would spend much of their time with family members. In fact, a closer examination of the data showed that "with their spouse" accounted for a significant portion of the experiences that were coded as "with others."

The generalization of the findings may be questioned because the characteristics of participants in this study might differ from those of the general population. For

example, participants in this study were recruited on a voluntary basis. They were potentially above average in terms of health, independence, and willingness to participate in activities. Furthermore, the participants in this study were exclusively Caucasian older adults. Perhaps including participants from different ethnic and racial groups as well as individuals from a variety of communities might strengthen the study and expand its generalizability.

Some research has demonstrated a gender effect in relation to the experiences of flow (Bryce & Haworth, 2002; Han, 1992). One reason that this study did not find a gender effect might have been caused by the study's small number of participants and the uneven distribution in the number of males ( $n = 6$ ) and females ( $n = 13$ ). Using a larger sample in future research may be helpful.

Other limitations involved the methodology of the study. For instance, this study did not use an instrument designed to measure serious leisure. At the time of this study, there were no instruments specifically designed to measure serious leisure. Furthermore, there currently exist no other measures of serious leisure designed to study serious leisure using a repeated measures design such as ESM. It could be suggested that future studies in this area use the items from the Serious Leisure Inventory and Measure (SLIM) by Gould et al. (2008). With regard to face validity of serious leisure items, there are similarities between the ones used in this study and SLIM, but reliability and validity of those items remains to be remedied. Whereas Stebbins (1992) identified six defining constructs of serious leisure, this study utilized three qualities of serious leisure. Due to the limitation of space in the Experience Sampling Form, the ESM technique used in the present study was unable to accommodate sufficient serious leisure items in that booklet. Because we relied on several aspects of serious leisure, we acknowledge that we did not provide a full picture of serious leisure. It is crucial to consider including those qualities that were ruled out. Future ESM-based research on serious leisure is needed to investigate those factors (e.g., perseverance, unique ethos) by implementing questions from SLIM such as "I overcome difficulties in the activities by being persistent" and "I share many of the sentiments of my fellow devotees".

Furthermore, while ESM seems to be one of the best choices to measure subjective daily experiences, the present study has shown that ESM still has some limitations. Perhaps employing a new approach (i.e., the Day Reconstruction Method [DRM], developed by Kahneman, Krueger, Schkade, Schwarz, & Stone, 2004) is a possible alternative that researchers might consider. The DRM data collection method involves constructing

a diary of the previous day that consists of a series of episodes. Such a procedure is useful because it measures both objective as well as subjective aspects of daily lives. The DRM is designed to produce a moment-based report, which also is purported to attain accurate recall by asking respondents to retrieve episodes from the previous day. Previous research has shown the effectiveness of this methodology (e.g., Srivastava, Angelo, & Vallereux, 2008). In DRM, respondents are asked to describe each episode and answer questions about the situation and feelings that they experienced as in ESM (Kahneman et al., 2004). DRM may possibly reduce burdens for the respondents, minimize disrupting normal daily activities of participants, and offer an assessment of experience over a full day. It also does not depend on the subject's selective memory and thus may provide an excellent depiction of how people budget their time.

In addition to the limitations we have discussed, this study's measurement of flow by using only perceived challenge and skill level may reveal only a small portion of all aspects and features of flow. Therefore, it is suggested that future studies investigate other components of flow (e.g., concentration, goals, loss of self-consciousness). It is also, however, worth noting that while using the balance between perceived challenge of an activity and skill level can be a restricted view of flow (Csikszentmihalyi, 1992a), it is still known as an important precondition for the flow experience (Whalen, 1997). Researchers have demonstrated the importance of the optimal balance approach on flow experience, and it was evidenced that optimal balance is a prerequisite of maintaining the enjoyment of flow (Egbert, 2003).

## Conclusion

Our research has demonstrated that examining older adults' daily lives using momentary assessments enhances the understanding of flow experiences. While a relationship between serious leisure and experiencing flow was not found, the findings suggest that retirement status and location contribute to older adults' flow experience. Further investigation of those issues is warranted so that practitioners working with older adults become aware of situations that are likely to produce flow-creating opportunities and thus be able to assist older adults in enhancing their well-being.

## References

- Borrell, K. (1998). Using the experience sampling method in gerontological social work. *Journal of Gerontological Social Work, 30*(3/4), 183–189.
- Brown, C. A., McGuire, F. A., & Voelkl, J. (2008). The link between successful aging and serious leisure. *International Journal of Aging and Human Development, 66*(1), 73–95.
- Bryce, J., & Haworth, J. (2002). Wellbeing and flow in sample of male and female office workers. *Leisure Studies, 21*, 249–263.
- Bryk, A.S., & Raudenbush, S.W. (1992). *Hierarchical linear models*. Newbury Park, CA: Sage.
- Burch, W.R., & Hamilton-Smith, E. (1991). Mapping a new frontier: Identifying, measuring, and valuing social cohesion benefits related to nonwork opportunities and activities. In B.L. Driver, P.J. Brown & G.L. Peterson (Eds.), *Benefits of leisure* (pp. 369–382). State College, PA: Venture.
- Carli, M., Delle Fave, A., & Massimini, F. (1988). The quality of experience in the 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.
- Csikszentmihalyi, M. (1975). *Beyond boredom and anxiety: Experiencing flow in work and play*. San Francisco: Jossey-Bass.
- Csikszentmihalyi, M. (1990). *Flow: The psychology of optimal experience*. New York: Harper and Row.
- Csikszentmihalyi, M. (1992a). 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.
- Csikszentmihalyi, M. (1992b). A response to the Kimiecik and Stein & Jackson papers. *Journal of Applied Sport Psychology, 4*, 181–183.
- Csikszentmihalyi, M. (1997). *Finding flow: The psychology of engagement with everyday life*. New York: Harper Collins.
- Csikszentmihalyi, M., Larson, R., & Prescott, S. (1977). The ecology of adolescent activity and experience. *Journal of Youth and Adolescence, 6*, 281–294.
- Debats, D.L., Drost, J., & Hansen, P. (1995). Experiences of meaning in life: A combined qualitative and quantitative approach. *British Journal of Psychology, 86*(3), 359–375.
- Delle Fave, A., & Massimini, F. (1988). Modernization and changing contexts of flow in work and leisure. In M. Csikszentmihalyi & I. Csikszentmihalyi (Eds.), *Optimal experience: Psychological studies of flow in consciousness* (pp. 193–213). New York: Cambridge University.
- Diener, E., Smith, H., & Fujita, F. (1995). The personality structure of affect. *Journal of Personality and Social Psychology, 69*, 130–141.
- Drentea, P. (2002). Retirement and mental health. *Journal of Aging and Health, 14*(2), 167–194.
- Eid, M., & Diener, E. (1999). Intraindividual variability in affect: Reliability, validity, and personality correlates. *Journal of Personality and Social Psychology, 76*, 662–676.

- Egbert, J. (2003). A study of flow theory in the foreign language classroom. *The Modern Language Journal*, 87, 499–518.
- Goff, S. J., Fick, D. S., & Oppliger, R. A. (1997). The moderating effect of spouse support on the relation between serious leisure and spouses' perceived leisure-family conflict. *Journal of Leisure Research*, 29(1), 47–60.
- Gould, J., Moore, D., McGuire, F., & Stebbins, R. (2008). Development of the serious leisure inventory and measure. *Journal of Leisure Research*, 40(1), 47–68.
- Graef, R. (2000). Flow patterns in everyday life. In M. Csikszentmihalyi (Ed.), *Beyond boredom and anxiety* (pp. 140–160). San Francisco: Jossey-Bass.
- Hamilton-Smith, E. (1992). Work, leisure and optimal experience. *Leisure Studies*, 11, 243–256.
- Han, S. (1992). The relationship between life satisfaction and flow in elderly Korean immigrants. In M. Csikszentmihalyi & I.S. Csikszentmihalyi (Eds.), *Optimal experience: Psychological studies of flow in consciousness* (pp. 138–149). New York: Cambridge University.
- Hawkins, B., Foose, A.K., & Binkley, A.L. (2004). Contribution of leisure to the life satisfaction of older adults in Australia and the United States. *World Leisure Journal*, 46(2), 4–12.
- Huebner, B.M. (2005). The effect of incarceration on marriage and work over the life course. *Justice Quarterly*, 22(3), 281–203.
- Hutchinson, S.L., & Kleiber, D.A. (2005). Gifts of the ordinary: Casual leisure's contributions to health and well-being. *World Leisure Journal*, 47(3), 2–16.
- Jones, C.D., Hollenhorst, S.J., & Perna, F. (2003). An empirical comparison of the four channel flow model and adventure experience paradigm. *Leisure Sciences*, 25, 17–31.
- Kahneman, D., Krueger, A.B., Schkade, D.A., Schwarz, N., & Stone, A.A. (2004). A survey method for characterizing daily life experience: The day reconstruction method. *Science*, 306, 1776–1780.
- Kelly, J.R., & Freysinger, V.J. (2000). *21st century leisure: Current issues*. Needham Heights, MA: Allyn & Bacon.
- Larson, R., Mannell, R., & Zuzanek, J. (1986). Daily well-being of older adults with friends and family. *Psychology and Aging*, 1(2), 117–126.
- Major, W.F. (2001). The benefits and costs of serious running. *World Leisure Journal*, 43(2), 12–25.
- Mannell, R., Zuzanek, J., & Larson, R. (1988). Leisure states and the flow experience: Testing perceived freedom and intrinsic motivation hypotheses. *Journal of Leisure Research*, 20(4), 289–304.
- Mannell, R.C. (1993). High investment activity and life satisfaction among older adults: Committed, serious leisure, and flow activities. In J.R. Kelly (Ed.), *Activity and aging* (pp.125–145). Newbury Park, CA: Sage.
- Moneta, G.B. (2004). The flow experience across cultures. *Journal of Happiness Studies*, 5, 115–121.
- O'Brien, S.J., & Conger, P.R. (1991). No time to look back: Approaching the finish line of life's course. *International Journal of Aging and Human Development*, 33(1), 75–87.
- Privette, G., & Bundrick, C.M. (1991). Peak experience, peak performance, and flow: Correspondence of personal descriptions and theoretical constructs. *Journal of Social Behavior & Personality: Special Issue: Handbook of Self-Actualization*, 6(5), 169–188.
- Pushkar, D., Arbuckle, T., Conway, M., Chaikelson, J., & Maag, U. (1997). Everyday activity parameters and competence in older adults. *Psychology and Aging*, 12(4), 600–609.
- Raudenbush, S.W., & Bryk, A.S. (2002). *Hierarchical linear models: Applications and data analysis methods* (2nd ed.). Newbury Park, CA: Sage.
- Raudenbush, S.W., Bryk, A.S., Cheong, Y.F., Congdon, R., & Toit, M. (2004). *HLM 6: Hierarchical linear and non-linear modeling*. Chicago: Scientific Software International.
- Russell, R.V. (1990). Recreation and quality of life in old age: A causal analysis. *Journal of Applied Gerontology*, 9, 77–89.
- Schwartz, J.E., & Stone, A.A. (1998). Strategies for analyzing ecological momentary assessment data. *Health Psychology*, 17(1), 6–16.
- Scollon, C.N., Kim-Prieto, C., & Diener, E. (2003). Experience sampling method: Promises and pitfalls, strengths and weaknesses. *Journal of Happiness Studies*, 4, 5–34.
- Sibthorp, J., Witter, E., Wells, M., Ellis, G., & Voelkl, J. (2004). Hierarchical linear modeling in park, recreation, and tourism research. *Journal of Leisure Research*, 36(1), 89–100.
- Siegenthaler, K.L., & O'Dell, I. (2003). Older golfers: Serious leisure and successful aging. *World Leisure Journal*, 45(1), 47–54.
- Srivastava, S., Angelo, K.M., & Vallereux, S.R. (2008). Extraversion and positive affect: A day reconstruction study of person-environment transactions. *Journal of Research in Personality*, 42, 1613–1618.
- Stebbins, R.A. (1992). *Amateurs, professionals, and serious leisure*. Montreal, QC, Canada: McGill-Queen's University.
- Stebbins, R.A. (2001). *New directions in the theory and research of serious leisure*. Lewiston, NY: Edwin Mellen.
- Stebbins, R.A. (2004). *Between work and leisure: A study of common ground of two separate worlds*. New Brunswick, NJ: Transaction.
- Stebbins, R.A. (2007). *Serious leisure*. New Brunswick, NJ: Transaction.

Swenson, M.M. (1998). The meaning of home of five elderly women. *Health Care for Women International, 19*, 381–393.

Whalen, S. (1997). *Assessing flow experiences in highly able adolescent learners*. Paper presented at the annual meeting of the American Educational Research Association in Chicago, IL.

Yaffey, D. (1991). Outdoor pursuits and adventure experience. *Journal of Adventure Education and Outdoor Leadership, 8*(2), 22–25.

Yau, M.K., & Packer, T.L. (2002). Health and well-being through T'ai Chi: Perceptions of older adults in Hong Kong. *Leisure Studies, 21*(2), 163–178.