

Identifying important factors for older adults' physical activity participation across individual/group, structured/unstructured contexts

Katie L. Beck¹ · Lori E. Weeks² · William J. Montelpare¹ · Dany J. MacDonald¹

Published online: 13 May 2016
© Springer-Verlag Berlin Heidelberg 2016

Abstract Most Canadian older adults do not meet physical activity recommendations. Researchers have investigated participation barriers and facilitators, with little consideration given to how specific factors influence activity participation for older adults. The purpose of this study was to identify unique factors that influence older adults' activity selection and to determine in which type of setting they are preferred. Using a two-phase methodology, identification of 25 factors affecting participation was followed by 45 older adults ranking the factors within four categories of activities: individual unstructured, group unstructured, individual structured, and group structured. Phase 1 analysis ranked each factor within each category. Further analysis found that there was a statistical difference between categories, indicating that older adults found different factors important, depending on the category of physical activity in question. This led to phase 2 analyses which identified three levels of factor groupings including the following factors: level A: fun, satisfaction, commitment, and energize; level B: safety, learning, awareness, internal motivation, and productive; and level C: meaningful contribution, intensity, and motivation. Additionally, some factors which were not identified in all categories were identified as unique to certain categories. These included creativity, hobbies, meaningful contribution, spiritual, competence, interaction casual, regularly

scheduled, competition, self-efficacy physical, and team. This information can be used by individuals as well as program providers to nurture these factors within physical activity programs, which may lead to increased participation in this age cohort.

Keywords Older adults · Physical activity · Factors · Importance · Participation

Identifying important factors for older adults' physical activity participation across individual/group, structured/unstructured contexts

Although the exact mechanisms of decreased physical activity participation in older adults are unknown, researchers suggest this may be due to changes in preferred physical activities as individuals' age. For example, people may transition from activities characterized by high intensity and competition as young adults, to activities that revolve around social relationships and enjoyment later in life as fitness levels change (King et al. 1998). Additionally, there is evidence that the meaning of exercise and reasons for engagement in exercise change as individuals' age (O'Brien Cousins 1996).

In an attempt to understand physical activity changes during older adulthood, researchers have focused on identifying barriers and facilitators to exercise participation (Bethancourt et al. 2014). In their study, Bethancourt et al. (2014) found that for older adults, barriers to physical activity participation included poor health, lack of professional guidance, and inadequate dissemination of information on available programs. They identified several facilitators of exercise participation including motivation to

Responsible editor: D. J. H. Deeg.

✉ Katie L. Beck
kbeck@upei.ca

¹ Department of Applied Human Sciences, University of Prince Edward Island, Charlottetown, PE C1A 4P3, Canada

² School of Nursing, Dalhousie University, Halifax, NS B3H 4R2, Canada

maintain physical and mental health and access to stimulating and accessible physical activity programs. This research was based on earlier research by Stiggelbout et al. (2008) who suggested that three groups of factors affect structured physical activity participation in older adults. These factors are personal (i.e., age, sex, socioeconomic status), social/cultural (i.e., social support of family and friends, influence of physician), and environmental (i.e., access to physical activity, travel time).

Specific to the older adult population, Schutzer and Graves (2004) identified additional barriers and facilitators that need to be considered. These additional barriers included health (i.e., pain, disease), knowledge (lack of understanding, awareness), and childhood exercise (i.e., physical activity experiences as a child). Additional facilitators include self-efficacy, prompts (i.e., informational mailings, telephone consultation), music, and demographics (i.e., age, sex, race, past history). As a whole, the literature surrounding facilitators and barriers helps us understand why individuals of all ages participate, or do not participate, in physical activity. Although barriers and facilitators are important factors related to participation in physical activity, they alone do not fully explain participation. A significant amount of additional information comes from behavior change theories, which help us to further understand physical activity participation or non-participation. Bauman et al. (2002) completed an in-depth review of theories and models used to identify the psychological, cognitive, social, and emotional variables that influence physical activity participation across the lifespan. The authors concluded that the main theories used in physical activity research are the Health Belief Model (Janz and Becker 1984), the Theory of Planned Behaviour (Godin 1993), Social Cognitive Theory (Bandura 1986), and the Trans-theoretical Model (Prochaska and Di Clemente 1982). In their review, Bauman et al. (2002) summarized the research by outlining the different determinants of physical activity associated with participation across the lifespan. Additionally, they tallied the determinants and related them to the theories mentioned above to determine which theory best explained the correlates most often associated with physical activity. Interestingly, of the determinants which were included within a specific theory, only 25 % matched with the Health Belief Model, 67 % aligned with the Theory of Planned Behaviour, 70 % followed Social Cognitive Theory, but 100 % of the determinants fit within the Trans-theoretical Model (Bauman et al. 2002). However, fifteen determinants were not associated with any one theory but were linked with physical activity. Although the Trans-theoretical Model may be best suited to explain participation, no single theory captures the entire spectrum of influences on physical activity participation. To this effect, Bauman et al. (2002)

suggested that “Perhaps progress at the current stage of understanding would best be served by a continued application of existing theories supplemented by creative thinking to evaluate influencing variables that are outside of current theories” (p. 12). This conclusion is directly related to the work of Bandura (2004) who proposed that a number of “other factors” related to physical activity participation exist. Bandura (2004) stipulated that while such factors may not be identified to date, they are relevant to our understanding of physical activity participation in older adults and should be explored.

However, focusing solely on behavior change theories does not provide the complete picture about motives for participation in physical activity. Additional elements need to be considered to fully understand physical activity participation. One such element is the enjoyment gained from participating in the activity. Dacey et al. (2008) posited that in older adults, enjoyment is extremely important and is one of the greatest predictors of sustained physical activity as individuals’ age. Within the physical activity context, enjoyment can be defined as a positive emotional response to participating in an activity characterized by generalized feelings of pleasure, liking, and fun (Scanlan et al. 1993). Yet, the construct of enjoyment runs deeper than simply doing something because it is fun. Fun plays a complex role in participation, and little is known about the development of enjoyment in physical activity in older adults (Mullen et al. 2011). Although enjoyment can predict participation in physical activity (Henderson et al. 2012), other researchers (Ruby et al. 2011) demonstrated that individuals may not participate because they fail to fully appreciate the enjoyment that can be gained. The difference between actual and expected enjoyment is an important distinction given that expected enjoyment can increase exercise intentions (Ruby et al. 2011). To test this hypothesis, Ruby et al. 2011 sought to quantify various aspects of enjoyment by having 279 participants predict how much they would enjoy an upcoming physical activity session, and by asking about enjoyment after finishing a session. When asked about how they would enjoy the physical activity as a whole, many focused on beginning the exercise, which lowered the perception of enjoyment due to the perceived physical stress of initiating the activity from a rested state. However, when the focus spanned the entire activity segment (beginning, middle, and end), individuals had a much higher rating of enjoyment. Overall, it was found that the largest barrier to enjoyment was the anticipation of the unpleasant beginning of an activity. Ruby et al. (2011) suggested that increasing positivity at the beginning of the activity and focusing individual’s attention across the entire experience can help to improve enjoyment of the activity.

The purpose of the present study was to identify previously unidentified and unique perceived factors that

contributed to physical activity participation in adults aged 60–80 years. This age range was selected as it focused on older adults who were near retirement from work or who had recently retired and may be interested in increasing their involvement in leisure time physical activity. At this age, they may have additional leisure time due to retirement and have not yet moved into advanced age where a decline in physical ability is normally observed. By determining and understanding which factors play a role in physical activity participation, tailored programs for older adults may lead to increased physical activity participation.

Current study

Phase 1: Methods

In the first phase of this study, we collected data from participants on which factors play a role in physical activity selection or non-selection. Then, in phase 2, we identified the importance of factors identified in phase 1.

Participants

A physical activity and aging research committee consisting of seven participants was formed using various media approaches which included: contacting community organizations directly, posting information on bulletin boards, and using a public service interview on the local radio station. These modes of recruitment created a snowball effect that was demonstrated by participants recruiting eligible family members, friends, and neighbors.

Five women and two men aged 67–75 ($M = 70.3$, $SD = 3.0$) formed this committee. Six of the seven participants were married or living in a common-law relationship, and one was widowed. Six participants had a college or university degree and lived with other individuals. All seven participants lived in a rural area, were retired, and considered their household income as average or above average compared to a typical family. Overall, the group was in self-reported good health and all reported engaging in regular physical activity.

Procedure

Following university ethics approval, the committee met for a 3-h meeting to identify factors associated with physical activity selection or non-selection. The meeting began by obtaining informed consent. Participants completed the demographic and physical activity questionnaire that included questions about age, marital status, education, income, health, and physical activity levels. The researcher explained the purpose of the meeting and described the

difference between factors, barriers, and facilitators (Schutzer and Graves 2004; Stiggelbout et al. 2008) to maintain focus of the discussion.

The committee's first task was to generate a list of factors that were perceived to influence activity selection. In generating the list, the group was asked to consider conventional sports like soccer, hockey, and curling as well as various types of physical activities such as going for a walk, cycling, completing home renovations, and gardening. As the discussion progressed and factors emerged, the researcher recorded each one on a whiteboard while the discussion continued. The researcher encouraged dialogue around topics that could be further developed by suggesting new physical activity scenarios. Once the group agreed that they had identified all possible factors, the list was considered complete. The committee consolidated the factors by grouping similar factors and expanding others that could be divided into more than one factor. Once the committee agreed that the factors were unique, the list was considered complete. Finally, the committee created a definition for each factor.

Phase 1: Results

Table 1 outlines the list of 25 factors identified by the committee along with the definition associated with each factor. In addition to identifying, defining, and providing examples for each of the 25 factors, the members of the committee identified that some factors were better suited to certain types or "categories" of physical activities than others. For example, they suggested that factors that influence participation in sports would be different than factors that influence participation in household activities. This led the committee to suggest that activities can be divided into two classifications: "structured" versus "unstructured." The committee also separated the factors into those that were better when participating alone versus as part of a group. This resulted in a second grouping of physical activities divided into either "individual" or "group" activities. As a result, the physical activities were organized into one of the following four categories: individual unstructured (IU), group unstructured (GU), individual structured (IS), and group structured (GS). Examples of IU activities include physical activities that are completed alone and without any structure or rules (raking leaves, going for a walk alone, etc.), GU activities are those that happen within a group but do not follow rigid structures or rules (walking or hiking clubs), IS activities include organized activity that do not require a team but are structured (marathon running, dance class, aerobics class), and GS activities typically include group sports (baseball, volleyball, basketball).

Table 1 Factors influencing physical activity participation, definitions, and examples

Factor name	Definition	Example
Awareness	Being alert to your surroundings and external elements	Going for a walk and noticing flowers, birds, berries, etc.
Commitment	Having an obligation to attend physical activity each week because you told others you would	Having a golf foursome who expects you to be there each week
Competence	Continually getting better at skills over time	Reducing score in golf
Competition	Activities in which there is a winner and loser or a ranking of finishers	Games which are played and a score is kept
Creativity	The ability to inject physical activity with your own creative twist	Dance or doing renovations to your house
Energize	To feel invigorated by the activity	Feeling like you have more energy after coming in from a walk in the sunshine
External motivation	Desire to participate comes from outside rewards	Desire to win a trophy
Fun	Providing entertainment or amusement	Having fun playing a sport
Hobbies	Activities that happen along with personal interests	Going for a walk and listening to podcasts or taking your camera to take photos
Intensity	The amount of energy expended ranging from low to high	A walking speed that allows conversation to long distance running which causes perspiration and makes conversation difficult
Interaction (casual)	Discussions among participants stay very general with broad topics	Conversation includes topics like the weather, work, etc.
Interaction (in depth)	Discussions among participants are much deeper and personal	Conversation includes topics like ideals, politics, religion, etc.
Internal motivation	Desire to participate comes from personal reasons	Desire to lose weight or have more energy
Meaningful contribution	Having an outcome that makes a difference to the betterment of a community or group	Habitat For Humanity house building
Mental (full engagement)	Requiring high levels of concentration on a task	Preparing for a challenging golf shot
Mental (mindless)	Requiring very little mental concentration	Raking leaves
Productive	Working toward a specific outcome while being physically active	Planting a vegetable garden
Regularly scheduled	Meeting(s) is at a particular time and day	Mondays from 2 to 3 pm
Safety	Consideration given to personal safety from external factors	Going for a walk with others in case you might fall, encounter a threatening person, etc.
Satisfaction/fulfillment	Feelings of having accomplished something worthwhile	Beating your personal best or completing a project you've been working on
Self-efficacy (mental)	The belief that you are/are not mentally able to do the activity successfully	I am/am not able to learn all the rules and techniques in golf
Self-efficacy (physical)	The belief that you are/are not physically able to do the activity successfully	I am/am not flexible enough to curl
Spiritual/meditation	Allowing participant time to reflect and relax	Going for a walk on the beach
Team	Working with other individual to accomplish a physical activity	Curling team, hockey team, etc.

Phase 2: Methods

Participants

A total of 45 participants were recruited in the second phase of the study and were recruited in the same fashion as phase 1. Participants involved in phase 1 of the study were excluded from phase 2 of the study. The 45 participants in phase 2 consisted of 10 men and 35 women aged

64–79 years ($M = 69.3$, $SD = 3.6$). The demographics questionnaire demonstrated that 24 participants (53 %) were married while 20 (44 %) were widowed, divorced, or never married, with one participant not reporting their marital status. Participants reported having a mix of education levels with 15 (33 %) having high school or less, 19 (42 %) having attended trade school or receiving a college diploma, and 11 (24 %) having a university degree or higher. Twenty-three participants (51 %) lived in a rural

area while 22 (49 %) lived in an urban area. The distribution of income was comparable for all wage brackets with 10 individuals (22 %) earning under \$24,999, 12 (27 %) earning \$25,000–\$49,999, and 10 (22 %) individuals earning more than \$50,000. However, 13 individuals (29 %) did not report their income level. Only 3 participants (7 %) reported having no health conditions and 31 participants (69 %) indicated being active during their entire lives.

Procedure

Participants were invited to attend one of 8 small group meetings. Each meeting involved between 2 and 8 participants, other than one meeting where only one participant attended. Each meeting began by obtaining informed consent from participants followed by brief introductions. Participants completed the same demographic and physical activity questionnaire as described in phase 1. Participants were provided with the list of 25 factors identified by the phase 1 participants as being related to motivation to participate in physical activity along with definitions and examples of each factor (Table 1).

After a brief conversation between the researchers and the participants confirming their understanding of each factor, the participants were provided with four paper forms, one for each of the four categories of physical activities identified in Phase 1. An example of a physical activity that would fit into each category was also given: individual unstructured (gardening); group unstructured (walking club); individual structured (marathon running/biking); and group structured (curling). The order in which the categories were presented to participants was counter-balanced to minimize order effects. Participants were asked to list any of the 25 factors that they personally felt were important in influencing physical activity in each of the four categories of physical activity. They could list as many of the 25 factors as they wished for each category. Participants were also encouraged to add any factors they felt were missing from the list at any time, although none did so.

Although most participants in Phase 2 completed the data collection process with other participants in the room, all forms were completed independently. Some discussion did occur between participants about whether or not they felt a factor was important or should be included in the list for ranking. Participants were encouraged to engage in this discussion but ultimately, each completed their own lists and ranked them independently.

Once each participant populated the four categories of physical activity with the list of factors, each participant was asked to rate the importance of the factors. This was achieved by having participants rank their top five most

important factors, from 1 (most important) to 5 (least important). After completing this task, the meeting ended by thanking participants and answering any questions.

Data analysis

Data analysis began by summarizing which factors were identified as most important for each of the four categories of physical activity. This was achieved by creating a frequency of rank (FoR) score, which was calculated by adding the total number of times each factor was identified as one of the five most important factors. For instance, if a factor was ranked as one of the top five most important factors 23 times, regardless of which rank, the FoR score would be 23. Since we were interested in the most important factors related to physical activity participation, we focused on the five most important factors identified by participants. Given that individuals participation revolves around a few primary reasons, identifying the top five reasons was believed to capture the essence of their participation motives.

A Cochran–Mantel–Haenszel Chi-square (χ^2) test was used to evaluate the differences between categories on the order of ranks. The test was used to determine if each category followed a similar pattern of ranks or if the four categories had different ranks.

Differences within categories were measured to determine which factors were most important. To understand the importance of factors within categories, the FoR score for each factor was used to determine the proportion score and calculate a 95 % confidence interval (CI). The proportion score was calculated by dividing the FoR score by the number of participants and multiplied by one hundred. CI was calculated using standard statistical formulas (Gravetter and Wallnau 2000). CI scores that included zero indicate that the factor was not a contributor while CI scores above zero indicate that the factor was considered as a contributor. Additionally, factors that did not overlap with their CI's were considered significantly different from one another. To explore patterns of factors within each of the four categories of physical activity, CI scores were compared to create levels of factors that had similar importance. This was achieved by starting with the factor with the highest proportion (and CI), and compared it to CI's of subsequent factors. Factors that had CI values that overlapped were included in the same level. Once a factor was identified as significantly different from the most important factor, a new level emerged. This continued until the list of factors was exhausted and no new levels emerged.

At the end of the analysis, each of the four categories contained four levels of factors. Table 3 provides a summary of the different factors within each level defined as

levels A, B, C, and other factors. Level A held the most important factors, level B the next most important, level C containing the second last most important factors, and other factors holding the remaining factors not identified previously.

Phase 2: Results

Results of the χ^2 goodness of fit test revealed a significant difference across the four categories ($\chi^2 = 75.9$, $p < 0.001$). The difference indicates that the rankings of factors differed across categories and that factors were not ranked consistently across each category. This result suggests that each category should be considered independently to gain a better understanding of which factors were important within each category (see Table 2 for complete list).

To investigate the importance of factors within categories, the CI's for each factor were compared. Given the results of the first analysis, investigation of factors was completed within each category to further explore the

importance of factors. A full list of the categories, levels, and where each factor was ranked is located in Table 3.

Fun was represented in level A in each of the four categories. Satisfaction was reported in three, while energize and commitment were reported in one category. For the categories where satisfaction, energize, and commitment were not listed in level A, they appeared as level B factors. Additionally, the factors of safety, learning, awareness, productive, and internal motivation appeared across the four categories. Each of these emerged as level B factors.

Above and beyond the commonalities that appeared across categories, certain factors were identified as important within each category. For the individual unstructured category, the factors creativity, hobbies, meaningful contribution, and spiritual were identified in level B while competence, hobbies, interaction casual, and spiritual were identified within level B in the group unstructured category. The individual structured category included competence and regularly scheduled as additional factors in level B, whereas the group structured category identified the unique factors of competence, competition,

Table 2 Frequency of Rank (FoR) score of factors by category (FoR score in brackets)

Individual unstructured	Group unstructured	Individual structured	Group structured
Fun (30)	Fun (33)	Fun (32)	Fun (30)
Satisfaction (20)	Satisfaction (22)	Satisfaction (23)	Commitment (21)
Energize (18)	Energize (19)	Safety (19)	Satisfaction (16)
Learning (17)	Awareness (16)	Commitment (17)	Safety (15)
Awareness (15)	Safety (15)	Learning (16)	Team (15)
Safety (15)	Commitment (15)	Energize (14)	Learning (14)
Productive (15)	Learning (15)	Competence (12)	Competence (11)
Creativity (14)	Productive (11)	Awareness (11)	Competition (11)
Spiritual (13)	Hobbies (11)	Productive (10)	Energize (9)
Internal motivation (13)	Spiritual (10)	Internal motivation (9)	Awareness (8)
Hobbies (10)	Interaction casual (10)	Regularly scheduled (8)	Internal motivation (8)
Commitment (9)	Internal motivation (9)	Hobbies (7)	Self-efficacy physical (8)
Meaningful contribution (8)	Competence (8)	Meaningful contribution (7)	Productive (7)
Self-efficacy physical (5)	Regularly scheduled (7)	Team (6)	Regularly scheduled (7)
Intensity (5)	Meaningful contribution (6)	Creativity (5)	Hobbies (6)
Mental mindless (5)	Team (3)	Spiritual (5)	Meaningful contribution (6)
Competence (4)	Self-efficacy physical (3)	Competition (4)	Mental full (5)
Mental full (3)	Intensity (3)	Self-efficacy physical (4)	Self-efficacy mental (5)
Regularly scheduled (2)	Competition (2)	External motivation (4)	External motivation (4)
Self-efficacy mental (2)	Self-efficacy mental (2)	Mental full (3)	Intensity (4)
Team (1)	Interaction in depth (2)	Self-efficacy mental (2)	Interaction casual (4)
Interaction casual (0)	Creativity (1)	Intensity (2)	Creativity (2)
Competition (0)	Mental full (1)	Interaction casual (2)	Interaction in depth (2)
Interaction in depth (0)	Mental mindless (1)	Mental mindless (2)	Spiritual (2)
External motivation (0)	External motivation (0)	Interaction in depth (0)	Mental mindless (0)

Table 3 Importance of factors by level* within category

Category	Level A	Level B	Level C	Other factors		
Individual Unstructured	Fun Energize Satisfaction	Awareness	Competence Intensity	Competition		
		Commitment	Mental mindless	External motivation		
		Creativity	Self-efficacy physical	Interaction casual		
		Hobbies		Interaction in depth		
		Internal motivation		Mental full		
		Learning		Regularly scheduled		
		Meaningful contribution		Self-efficacy mental		
		Productive		Team		
		Safety				
		Spiritual				
		Group Unstructured	Fun Satisfaction	Awareness	Meaningful contribution	Competition
				Commitment	Regularly scheduled	Creativity
				Competence		External motivation
Energize				Intensity		
Hobbies				Interaction in depth		
Interaction casual				Mental full		
Internal motivation				Mental mindless		
Learning				Self-efficacy mental		
Productive				Self-efficacy physical		
Safety				Team		
Spiritual						
Individual Structured	Fun Satisfaction			Awareness	Competition	Intensity
				Commitment	Creative	Interaction casual
		Competence	External motivation	Interaction in depth		
		Energize	Hobbies	Mental full		
		Internal motivation	Meaningful contribution	Mental mindless		
		Learning	Self-efficacy physical	Self-efficacy mental		
		Productive	Spiritual			
		Regularly scheduled	Team			
		Safety				
		Group Structured	Commitment Fun	Awareness	External motivation	Creativity
				Competence	Intensity	Interaction in depth
				Competition	Interaction casual	Mental mindless
				Energize	Mental full	Spiritual
Hobbies	Self-efficacy mental					
Internal motivation						
Learning						
Meaningful contribution						
Productive						
Regularly scheduled						
Safety						
Satisfaction						
Self-efficacy physical						
Team						

* Levels A, B, C, and other factors denote grouping of factors which are statistically more important than the following grouping. Factors in level A are the most important, with other factors being the least important

hobbies, meaningful contribution, regularly scheduled, self-efficacy physical, and team. The remaining factors were not identified as important factors across the categories.

Discussion

The purpose of this study was to identify factors that may influence leisure time physical activity that pursuits in older adults aged 60–80 and address the identification of “other factors” as described by Bandura (2004). Additionally, the context or setting in which they happen was dissected and analyzed.

The results obtained across the four categories of physical activity show consistent trends. Certain factors ranked high in importance, consistently while other factors ranked low, consistently (see Table 3). Although it was found that contexts should be considered separately, results suggest agreement among older adults as to which factors are most important.

Enjoyment was the top-ranked factor across all four categories of physical activity. The identification of enjoyment as a salient factor in physical activity selection is consistent with prior research in the older adult population (Dacey et al. 2008; Ruby et al. 2011; Henderson et al. 2012). Bauman et al. (2002) identified “enjoyment of exercise” as a correlate of physical activity that is not fully explained by a theory or model, and called for more research on the topic. Additionally, Dacey et al. (2008) suggest that it may be important to consider actual versus expected enjoyment when trying to understand the significance of the construct. The present findings suggest that regardless of the category of physical activity (i.e., group/individual, structured/unstructured), some form of enjoyment is needed to promote participation. By extension, it is reasonable to assume that activities which are not perceived as enjoyable will be selected less often by older adults. Therefore, it may be possible to increase physical activity participation in older adults by ensuring that the activity is highly enjoyable. Although previous research has identified the meaning of physical activity enjoyment in youth (see Weiss and Williams 2004), the concept of physical activity enjoyment in older adults has not been fully explored. Future research should investigate the meaning of physical activity enjoyment in older adults to better understand how it can be achieved.

Satisfaction was the second most important factor and was identified in all categories, except group structured. To date, no research has measured satisfaction as it relates to physical activity preferences for any age. This novel factor should be studied more thoroughly as it was frequently identified in our study as being very important to this

cohort in physical activity selection. Of course, each individual will have a different view of satisfaction in physical activity, but by recognizing its importance, steps can be taken to integrate satisfaction into programs in ways that broadly promote this factor. This might be achieved by asking older adults what they feel is a worthwhile accomplishment, and providing opportunities for individuals to achieve this. For example, a participant might feel that helping to improve the environment is worthwhile, so picking up garbage along a walk might provide opportunity for satisfaction.

Commitment and energize emerged as important factors in level A. Commitment was identified as important in group structured activities, while energize was found in individual unstructured. Within the context of group structured activities, it would be expected that individuals value commitment as participants may feel like they have a social obligation to the group. This finding is consistent with previous research by Scanlan et al. (1993) that identified commitment as an important factor related to participation. They also found that commitment to physical activity and enjoyment were intimately related. This reinforces current findings of enjoyment and commitment as important contributors to physical activity selection in older adults. The factor energize is also associated with enjoyment literature. In a study by Fridlung Dunton and Vaughan (2008), it was observed that when a participant anticipated positive emotional outcomes, such as enjoyment or being energized, they showed an increase in physical activity adoption and adherence. Additional research utilizing the Physical Activity Enjoyment Scale also addresses the concept of being energized by addressing the construct with an energizing/tiring dichotomy (Kendzierski and DeCarlo 1991). Taken together, the results of the present study suggest that the four most important factors of fun, satisfaction, commitment, and energize are intimately related and should be strongly considered when planning activities for older adults.

Five additional factors were consistently identified across the four categories of level B (safety, learning, awareness, productive, and internal motivation). The concept of safety has been identified as an important factor in previous research. More specifically, research has shown that individuals are more likely to participate in activities when they perceive the environment to be safe (Cleland et al. 2015). Although not the most important factor related to participation, this finding underscores the importance of ensuring that older adults have a safe environment in which to participate.

Learning was a consistent factor in level B. Many participants commented that learning as they age was important and its relatively high rank of importance among all factors is evidence of this. This suggests that individuals

will be interested in activities that stimulate them cognitively. Physical activity's positive effect on cognitive functioning are well documented (Kerr et al. 2013) and our results reinforce that learning opportunities should be considered when designing physical activity opportunities for older adults. Therefore, it is suggested that physical activity programmers provide opportunity for learning in order to stimulate participation and enhance the well-being of older adults.

Productivity was also identified across categories of physical activity for level B. A study by Witcher et al. (2007) explored physical activity participation in rural Newfoundland. A central theme from their study was the need for physical activity to be seen as productive versus participating in the activity just "for the sake of health" (p. 179). Additionally, it was found that older adults perceived leisure time activity as something that could be done only once all of the necessary work and chores were completed (Witcher et al. 2007). These types of attitudes were also identified in the current study as individuals indicated that being productive was of great importance to them.

Another factor found in level B was awareness. Recent research by Price et al. (2012) found that a person's interaction with their environment affects their level of participation. While observing older adults on a walking trail, they found that most used the trail in spring, on sunny days, and in moderate weather. It was noted that these conditions provide the most pleasant experience and the best opportunity to enjoy the experience (Price et al. 2012). Further exploration and explanation is needed to verify this claim and to better understand how the concept of awareness influences physical activity participation of older adults.

The final factor identified in each category for level B was internal motivation. Internal (or intrinsic) motivation and its importance to physical activity participation have been reported (Deci and Ryan 1985). One study by Dacey et al. (2008) found that intrinsic motivation was correlated with increased physical activity participation in older adults. These findings corroborate our results and underscore the importance of internal motivation when attempting to encourage participation in this population.

As outlined in the results, certain factors were identified as important only within specific categories. These results suggest that above and beyond the commonalities identified above, each category holds certain idiosyncrasies that should be considered. These additional factors are important and should be considered by practitioners offering physical activity programs within these categories.

A closer look at level C factors show a mix of intrinsic (i.e., self-efficacy, creativity) and extrinsic (i.e., teams, competition) aspects of participation. Although it would be of interest to further investigate how these factors link with

the motivation of individuals (Deci and Ryan 1985), we believe that their relative (un)importance compared to Levels A and B factors mitigates their relevance. Therefore, we suggest that priority be given to Levels A and B factors as they will likely have a stronger influence on sustained participation.

Limitations and future directions

Although the results of this study help us understand the role of additional factors in activity selection in older adults, limitations exist. First, it is unclear if this is an exhaustive list of factors. Although participants in phase 2 were encouraged to suggest additional factors, it is possible that not all factors were identified. Second, data were collected from participants in a range of group sizes. It is not clear what effect group size and dynamics may have played on individual responses. Future research may ask participants to rank factors individually prior to a group discussion in an attempt to limit the group's influence. Third, participants were asked to only rank their top five most important factors. Having participants rank all 25 factors in further study may yield a more in-depth analysis. Finally, participants were all from one region of Canada, were mostly female, and were of similar ethnic and cultural background. Caution needs to be taken in generalizing our results. Further research is warranted with larger and more diverse samples to determine if these factors hold true across different cultural and demographic settings.

Conclusion

Ultimately, the data show which factors are most important to older adults when selecting physical activity and address Bandura's (2004) call for the identification of "other factors" influencing physical activity participation for older adults. This research provides practical information that can be implemented into a variety of physical activity contexts. The results of this study are useful for researchers, community members, and physical activity planners who are interested in creating programs for older adults. The knowledge of which factors are most important in which context allows these parties to modify physical activity programs for older adults so that they become more appealing, and thereby lead to increased participation. This may help address the inactivity levels in older adults, and could consequently help improve overall health (Janssen 2012). Finally, these results can be used to guide further exploration and analysis of factors that lead to physical activity selection in older adults.

Compliance with ethical standards

Informed consent All participants provided signed informed consent forms before proceeding with participation in this research.

Research involving human participants This research is in compliance with human ethics guidelines and was approved by the Research Ethics Board at the University of Prince Edward Island.

References

- Bandura A (1986) Social foundations of thought and action: a social cognitive theory. Prentice-Hall, New Jersey
- Bandura A (2004) Health promotion by social cognitive means. *Health Educ Behav* 31:143–164. doi:10.1177/1090198104263660
- Bauman A, Sallis J, Dzawaltowski D, Owen N (2002) Toward a better understanding of influences on physical activity. *Am J Prev Med* 23(2S):5–14. doi:10.1016/S0749-3797(02)00469-5
- Bethancourt HJ, Rosenberg DE, Beatty T, Arterburn DE (2014) Barriers to and facilitators of physical activity program use among older adults. *Clin Med Res* 12:10–20. doi:10.3121/cm.2013.1171
- Cleland V, Sodergren M, Otahal P, Timperio A, Ball K, Crawford D, Salmon J, McNaughton SA (2015) Associations between the perceived environment and physical activity among aged 55–65 years: Does urban-rural area of residence matter? *J Aging Phys Activ* 23:55–63
- Dacey M, Baltzell A, Zaichkowsky L (2008) Older adults' intrinsic and extrinsic motivation toward physical activity. *Am J Health Behav* 6:570–583
- Deci EL, Ryan RM (1985) Intrinsic motivation and self-determination in human behavior. Plenum, New York
- Fridlung Dunton G, Vaughan E (2008) Anticipated affective consequences of physical activity adoption and maintenance. *Health Psychol* 27:703–710
- Godin G (1993) The theories of reasoned action and planned behavior: Overview of findings, emerging research problems and usefulness for exercise promotion. *J Appl Sport Psychol* 5:141–157. doi:10.1080/10413209308411311
- Gravetter FJ, Wallnau LR (2000) Statistics for the behavioural sciences, 5th edn. Wadsworth, Canada
- Henderson KA, Casper J, Wilson BE, Dern L (2012) Behaviours, reasons, and outcomes perceived by senior games participants. *J Park Rec Admin* 30:19–35
- Janssen I (2012) Health care costs of physical inactivity in Canadian adults. *Appl Physiol Nutr Metab* 37:1–4. doi:10.1139/h2012-061
- Janz N, Becker M (1984) The health belief model: a decade later. *Health Educ Quart* 11:1–47. doi:10.1177/109019818401100101
- Kendzierski D, DeCarlo KD (1991) Physical activity enjoyment scale: two validation studies. *J Sport Exercise Psychol* 13:30–64
- Kerr J, Marshall SJ, Patterson RE, Marinac CR, Natarajan L, Rosenberg D, Wasilenko K, Crist K (2013) Objectively measured physical activity is related to cognitive function in older adults. *J Am Geriatr Soc* 61:1927–1931. doi:10.1111/jgs.12524
- King AC, Rejeski WJ, Buchner DM (1998) Physical activity interventions targeting older adults: a critical review and recommendations. *Am J Prev Med* 15:318–333
- Mullen SP, Olson EA, Phillips SM, Szabo AN, Wojcicki TR, Mailey EL, McAuley E (2011) Measuring enjoyment of physical activity in older adults: invariance of the physical activity enjoyment scale (paces) across groups and time. *Int J Behav Nutr Phys Activ* 8:1–10. doi:10.1186/1479-5868-8-103
- O'Brien Cousins S (1996) Exercise cognition among elderly women. *J Appl Sport Psychol* 8:131–145. doi:10.1080/10413209608406472
- Price AE, Reed JA, Long S, Maslow AL, Hooker SP (2012) The association of natural elements with physical activity intensity during trail use by older adults. *J Phy Activ Health* 9:718–723
- Prochaska JO, Di Clemente CC (1982) Transtheoretical therapy: TOWARD a more integrative model of change. *Psychother Theor Res* 19:276–288. doi:10.1037/h0088437
- Ruby MB, Dunn EW, Perrino A, Gillis R, Viel S (2011) The invisible benefits of exercise. *Health Psychol* 30:67–74. doi:10.1037/a0021859
- Scanlan TK, Carpenter PJ, Schmidt GW, Simons JP, Keeler B (1993) An introduction to the sport commitment model. *J Sport Exercise Psychol* 18:1–15
- Schutzer KA, Graves BS (2004) Barriers and motivations to exercise in older adults. *Prev Med* 39:1056–1061. doi:10.1016/j.ypmed.2004.04.003
- Stiggelbout M, Hopman-Rock M, van Mechelen W (2008) Entry correlates and motivations of older adults participating in organized exercise programs. *J Aging Phys Activ* 16:342–354
- Weiss MR, Williams L (2004) The why of youth sport involvement: a developmental perspective on motivational processes. In: Weiss MR (ed) *Dev sport exercise psychol: a lifespan perspective*. Morgantown, WV, pp 223–268
- Witcher CSG, Holt NL, Spence JC, O'Brien Cousins S (2007) A case study of physical activity among older adults in rural Newfoundland, Canada. *J Aging Phys Act* 15:166–183