An Evaluation of Health Canada's Physical Activity Guides to Healthy Active Living as Motivational Instruments

by

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B.A. Psychology, University of Victoria, 2003

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SUPERVISORY COMMITTEE

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ABSTRACT

Health Canada has published national physical activity guidelines, which are included in their 27-page *Physical Activity Guide to Healthy Active Living.* To date, the use of these guides as motivational instruments for physical activity promotion has not been evaluated. The purpose of this study was to determine whether or not reading the guide 1) increased motivational antecedents to engage in regular physical activity, and 2) increased regular physical activity intention and behaviour over a one month period. Participants included 130 randomly sampled Canadian adults (18 years or older) from Victoria, British Columbia, who were randomly mailed packages consisting of either 1) a questionnaire and a copy of Health Canada's guide, or 2) just a questionnaire. Questionnaire items pertained to participants' socio-demographics, physical activity behaviours (Godin Leisure-Time Exercise Questionnaire), and physical activity motivation (Theory of Planned Behaviour). One month following the completion and return of the first questionnaire, participants were sent a one-month follow-up questionnaire pertaining to their physical activity behaviours throughout the previous month. A manipulation check of randomization between conditions suggested no differences in demographics, prior physical activity, or knowledge of the guide ($p > .10$). Results revealed significant interactions between the guide condition and physical activity status on instrumental behavioural beliefs ($F_{2,112} = 6.65$, $p < .01$, $\eta^2 = 0.05$), and subjective norm ($F_{2,115} = 5.72$ $p < .05$, $\eta^2 = 0.05$), but no other factors were significantly different ($p > .10$). It was concluded that among physically inactive people, receiving Health Canada's guide may increase some informational/motivational constructs, but key motivational antecedents (affective attitude, perceived behavioural control) and outcomes (intention, behaviour) seem unaffected.

Supervisor: Dr. Ryan E. Rhodes, (School of Physical Education)

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A special thanks to my family, Dave, and the Kennedy family for their love, support, and encouragement.

DEDICATION

I dedicate this thesis to my family. Many thanks for all of your support, not just throughout my studies, but for each day. Your unconditional love and support, your encouragement and patience, and your generosity and kindness mean the world to me. I love you very much.

CHAPTER 1: INTRODUCTION

In 1998, Health Canada developed a 27-page *Physical Activity Guide to Healthy Active Living* in response to the low levels of physical activity among Canadian adults (people aged 18 years and older). By 1999, a version tailored specifically to the older adult population (people aged 65 years and older) was developed. According to research conducted by Health Canada, (2003) Canadians were unaware of the associated risks of physical inactivity, and wanted a valid and practical guide similar to *Canada's Food Guide to Healthy Eating* to help them judge, in general, how much physical activity they needed to engage in so as to achieve better health.

Health Canada's physical activity guide is based on current Exercise Science evidence and was developed and tested in consultation with many stakeholders (i.e., scientific experts, provincial representatives, non-governmental organizations associated with health, ordinary Canadian citizens). Prototypes of the guide were evaluated through a national concept-testing phase, which included country-wide focus groups with citizens, health and fitness practitioners, and a survey of more than 150 public, voluntary and professional stakeholder organizations (Health Canada, 2003).

Despite the detailed and rigorous development procedure, the reach of the guides has been poor. For example Spence et al. (2002) found less than one third of Albertans were aware of Health Canada's recommended physical activity levels. Moreover, a test of the efficacy of the guide as a motivational intervention has never been evaluated. This evaluation seems prudent considering the effort spent producing the guide.

According to Marcus, Owen, Forsyth, Cavill, and Fridinger (1998a), print-based interventions, such as the guide, offer the possibility of reaching larger numbers of individuals at

a lower cost than that associated with services that involve face-to-face contact with health care providers.

In 1998, Marcus et al. (1998a), conducted a review of 28 studies evaluating the effectiveness of various forms of physical activity interventions (mass-media, print-media and information technology). Of the 28 studies reviewed by Marcus et al. (1998a), nine involved an examination of print-based media (Owen et al., 1987; Marcus et al., 1992, 1996, 1997, 1998b; King et al., 1991, 1995; Cardinal et al., 1995, 1996). Overall, Marcus et al. (1998a) found that messages that were more structured tended to be outperformed by media-based approaches that allowed for greater flexibility. Further, Marcus et al. (1998a) have suggested that due to health-care professionals' limited amounts of time, print-based media may serve as a useful alternative to extensive personal counselling in the delivering of information that would otherwise be repeated for each individual counselled. Moreover, Marcus et al. (1998a) have suggested that print-based media would allow for the supplying of additional information, as well as a means of follow-up in the maintenance phase.

To evaluate the guide as a physical activity intervention, this study utilized constructs from Ajzen's Theory of Planned Behaviour (1991). The Theory of Planned Behaviour is a popular model focusing on the informational and motivational influences on behaviour and its efficacy in the physical activity domain is well-supported (Hagger et al., 2002). Further, the guide was created on the basis of social cognition theories with particular consideration of the key factors influencing individual-level motivation and behaviour (Health Canada, 2003). My own content analysis of the guide found all information within the guide to fall under the behavioural, normative, or control beliefs represented within the Theory of Planned Behaviour.

CHAPTER 2: METHOD

Pilot Work

A pilot study was conducted to examine beliefs surrounding physical activity in a random sample of adults (aged 18 years and older) living in British Columbia. Potential participants were selected through a consumer marketing service (infocanada.ca). For the pilot study, 300 Questionnaires (see Appendix D) were sent through the mail, and participants were asked to fill out information regarding demographics, their perceived beliefs about physical activity, and their engagement in endurance activity, strength activity, and flexibility activity. Overall, there was an 18% response rate, with a total of 55 adults responding to the questionnaire. Of the 55 adults, 15 were older adults (aged 65 years and older).

Following procedures proposed by Ajzen (2002), participants' responses to the pilot study questions were used to construct a list of "modal accessible beliefs" (i.e., a list of the most commonly held beliefs of all participants). This list was constructed in order to create items for the questionnaire used in this thesis. According to Ajzen (2002), generally five to eight beliefs are identified.

One hundred percent of the modal accessible beliefs endorsed by the 15 older adults in the pilot-study were used to construct the standard questionnaire used in this thesis (i.e., any given belief listed by an older adult was included as a modal accessible belief). Beliefs endorsed by the 40 younger adults (18-64 years) were similar to those endorsed by the 15 older adults, however, there were several beliefs unique to and endorsed only by the older adults, and are as follows:

Behavioural Beliefs: "Reduce injury"
"Improve or maintain my social life"
"Control my weight"
"Gets me out of the house"

Normative Beliefs: "My dog"
"Workout partner"

Control Beliefs: "Knowing proper technique"
"It gives me something to do"

Beliefs endorsed by both younger and older adults are as follows:

Behavioural Beliefs: "Make me feel good"
"Take too much of my free time"
"Improve my physical appearance"
"Reduce my chances of chronic disease"
"Help relieve my stress"
"Cause muscle soreness"
"Help maintain my independence"

Normative Beliefs: "My family"
"My friends"
"Health professionals"
"Spouse/romantic partner"
"Fitness instructors/trainers\coaches"

Control Beliefs: "Other time commitments"
"Financial cost"
"Injury/other health issues"
"Access to a gym/recreation centre"
"Not having someone to do the activity with"
"Bad weather"

***A copy of the questionnaire used in the current study can be found in Appendix G

Current Study

Ethical approval for the current study was sought and approved through the University of Victoria Office of the Vice President Research. To carry out the current study, I followed a randomized post-test only experimental design with a one-month follow-up of intention and behaviour.

Participants

An initial sample of 1000 people was selected from a randomly generated list of residences in the Greater Victoria area through a consumer marketing service (superpages.ca).

The target sample for this thesis was originally set at 102 metro-Victoria older adults (aged 65 years and older), and was to be derived from an overall sample of 1000 people. This target sample of N = 102 was based on Cohen's (1988) medium effect size, and was justified using G-power (Erdfelder, Faul, & Buchner, 1996). Due to a poor response rate (13% of the initial 1000 people), however, the sample was collapsed to include all adults (anyone aged 18 years or older).

Procedure

Potential participants (N = 1000) were randomly assigned to either the experimental condition or to the control condition by deeming the first 500 names on the mailing list from superpages.ca list as "Control" and the next 500 names as "Experimental".

The first mail-out took place February 15, 2005. The experimental group (N = 500) was sent packages containing copies of both Health Canada's guide for adults, and guide for older adults, and their accompanying handbooks, along with a questionnaire with a postage-paid, self-addressed return envelope. Also included in the packages were information letters (see Appendix E) asking the participant to first read the enclosed guide and handbook corresponding to their current age (adult guide if aged 18-64 years, and older adult guide if aged 65 years and older), and then complete and return the enclosed questionnaire. The control group (N = 500) was sent packages containing a questionnaire with a postage-paid, self-addressed return envelope, and an information letter (see Appendix F) asking them to fill out and return the enclosed questionnaire.

Following the Total Design Method (Dillman, 1990), one month following the first mail-out (March 15, 2005), a second mail-out was sent to individuals who had not yet returned the

initial questionnaire package, to individuals who had not already informed me that they did not wish to participate in my study, and to individuals whose packages did not get sent back with labels such as "Return to Sender", "Moved", or "Deceased". The contents of the second mail-out were the same as the first, however, also included in the second mail-out package was a letter reminding potential participants about the study and asking them to complete the questionnaire package and return it at their earliest convenience.

One-month following the completion and return of the questionnaires from the first and second mail-outs, consenting participants were sent a one month follow-up questionnaire (see Appendix H) to complete. Questions included in the one month follow-up pertained to their frequency of engagement in endurance, strength, and flexibility activities throughout the previous month, as well as their activity intentions for the near future. Participants were sent their one month follow-up questionnaire exactly one month following the return of the initial questionnaire, and these dates were all kept track of in an Excel spreadsheet.

The first mail-out, sent February 15, 2005, yielded 132 responses producing 78 eligible participants who completed and returned their questionnaire package. The remaining 54 of the 132 responses included 26 "Return to Sender", 7 "Moved", 9 "Deceased", 3 "self-reported Physically or Cognitively impaired" and 11 "Decline participation in the current study".

The second mail-out, sent March 15, 2005 to 868 people of the initial 1000, yielded 88 additional responses producing 52 more eligible participants who completed and returned their questionnaire package. The remaining 36 of the 88 responses included 17 "Return to Sender", 10 "Moved", 4 "Deceased", and 5 "Decline participation in the current study".

From the first and second mail-outs, a total of N = 130 completed and returned the initial questionnaire. Of the 130 people who completed the initial questionnaire, 88 also completed and returned the one month follow-up questionnaire.

Demographic characteristics of the sample (N = 130) were: median age 54.00 years (SD = 14.30), 44.60 % female, 37.70 % married/common law, 57.90 % currently employed, 66.26 % making an annual income of $40,000 or more, and 56.25 % of the sample with a university or college degree. In terms of health behaviour indicators, mean BMI was 25.70 (SD = 4.50), 32.30 % reported having a close relative who had been diagnosed with heart disease before the age of 60, 26.20 % reported suffering from high blood cholesterol, 30.20 % reported suffering from high blood pressure, and 50.80 % reported that they were previously aware of Health Canada's recommended amounts of physical activity. Demographic and health behaviour indicators according to group, and comparison statistics for the entire Victoria adult population can be found in Table 1. When comparing the demographic characteristics of the sample to those of the city of Victoria adult population (Statistics Canada 2001 Census), some trivial, and insignificant differences were found. I found that a greater percentage of my sample had obtained a college or university degree (respectively, my sample 56.25%, Victoria 50.14%), that a greater percentage of my sample was earning an annual household income of more than $40,000 (respectively, my sample 66.26%, Victoria 58.24%), and that the median age of my sample was greater by approximately ten years (respectively, my sample 54.00 years, Victoria 43.30 years). All remaining socio-demographic variables appeared to be the same, even those pertaining to current physical activity levels (CFLRI 2003).

Table 1 Demographic, Medical and Exercise Profile

Characteristic	Control	Experimental	p-Level
Demographic Profile			
Age Median (SD)	54.50 (16.44)	52.71 (11.68)	.48
% Female	36.37	53.97	.05
% Married/Common-Law	33.33	41.27	.35
% Completed University	58.46	53.97	.61
% > $40,000	63.12	69.50	.47
% Currently Employed	54.55	62.71	.36
Medical Profile			
% Previously Aware of Recommended Amounts of Physical Activity Mean (SD)	50.00	52.38	.79
% Close Relative with Heart Disease Before 60 Years of Age	28.79	34.92	.46
% High Blood Cholesterol	26.56	26.23	.97
% High Blood Pressure	36.51	24.19	.14
BMI	25.16 (3.94)	26.24 (4.96)	.18
Past Exercise Mean (SD)			
Endurance Mild Minutes	122.23 (217.98)	143.25 (259.26)	.62
Endurance Moderate Minutes	105.78 (106.87)	104.82 (91.59)	.96
Endurance Strenuous Minutes	103.44 (164.63)	98.56 (116.34)	.79
Endurance Strenuous + Moderate Minutes	209.22 (189.49)	201.38 (159.98)	.80
Endurance Total Minutes	333.36 (257.73)	347.98 (335.89)	.79
% Meeting Health Canada's Guidelines	63.07	60.66	.78
Strength Total Minutes	90.78 (150.53)	77.87 (92.39)	.59
% Meeting Health Canada's Guidelines	49.23	44.26	.58
Flexibility Total Minutes	37.41 (50.54)	38.35 (58.88)	.93
% Meeting Health Canada's Guidelines	20.00	21.31	.86

***Note incidence was too small to provide statistical tests for angina, stroke, diabetes and heart attack. These four diseases surfaced as risk factors, but N< 5 and consequently Chi ^{2} could not be computed, and all were below 10%

Measures

Theory of Planned Behaviour constructs were assessed using validated items of Ajzen, (2002) and belief level items created in pilot work based on Health Canada's (2002) physical activity recommendations. All constructs were measured using 5-point Likert-scale type questions (1 being strongly disagree and 5 being strongly agree) Preceding all *Attitude/Behavioural Belief* adjectives, *Subjective Norm/Normative Belief* adjectives, and *Perceived Behavioural Control/Control Belief* adjectives was the statement "Over the next month…". The majority of questionnaire items pertained to strength, endurance, and flexibility activities at moderate (i.e., not exhausting but light perspiration), and strenuous (heart beats rapidly and sweating) intensities. Examples of endurance activities, as suggested by Health Canada (1998) were " brisk walking or running, golfing without a ride-a-cart, yard and garden work, cycling, skating, continuous swimming, tennis, dancing, etc". Examples of strength activities, as suggested by Health Canada (1998) were "heavy yard work such as cutting and piling wood, raking and carrying leaves, exercises like sit-ups and push-ups, and weight-training routines". Examples of flexibility activities, as suggested by Health Canada (1998) were "stretching routines, Tai-Chi, yoga, and dance".

Attitude was measured using two items that reflect the affective (i.e., enjoyable-un-enjoyable, pleasant-unpleasant) component, and two items that reflected the instrumental (i.e., wise-unwise, beneficial-harmful) component. Several studies have been conducted in the physical activity research domain, which support the distinction of these attitudinal components (Rhodes, Courneya, & Jones, 2003; Rhodes & Courneya, 2003b). Preceding the four *Attitude* adjectives was the statement "Over the next month, doing these activities would be". Cronbach's alpha coefficients of internal consistency for *Affective Attitude* across activities were 0.90 for

endurance, 0.72 for strength, and 0.86 for flexibility. Cronbach's alpha coefficients of internal consistency for *Instrumental Attitude* across activities were 0.70 for endurance, 0.90 for strength, and 0.69 for flexibility.

Using 11 items, *Behavioural Beliefs* were measured by asking participants to rate how engaging in endurance, strength, and flexibility activities over the next month would be (see Table 2). Cronbach's alpha coefficients of internal consistency for *Behavioural Belief* aggregates across activities were 0.74 for endurance, 0.72 for strength, and 0.78 for flexibility.

Subjective Norm was measured by combining two items reflecting the injunctive component of subjective norm and one item reflecting the descriptive component (see Table 2). The combination of these injunctive and descriptive components was based on Ajzen's (2002) recommendations, and results of Rhodes and Courneya (2003a). Reliabilities for *Subjective Norm* measures were as follows: endurance, $\alpha = 0.81$, strength, $\alpha = 0.78$, and flexibility, $\alpha = 0.74$.

Using 12 items, *Normative Beliefs* were assessed by asking participants to complete the phrases"Over the next month…will approve of me engaging in", and "Over the next month...will be engaging in". Both phrases were paired with six items each, and both phrases applied to endurance, strength, and flexibility activities (see Table 2). Reliabilities were as follows: endurance, $\alpha = 0.80$, strength, $\alpha = 0.79$, and flexibility, $\alpha = 0.74$.

Perceived Behavioural Control was measured by three previously recommended (Rhodes & Courneya, 2003b, 2004) items (see Table 2). All three questions pertained to endurance, strength, and flexibility activities. Cronbach's alpha coefficients of internal consistency were 0.89 for endurance, .75 for strength, and .81 for flexibility.

Control Beliefs were measured using eleven items. Participants were asked to rate their control over engaging in endurance, strength, and flexibility activities over the next month (see Table 2): *Perceived Behavioural Control* measures were reliable at $\alpha = 0.89$ for endurance, $\alpha = .81$ for strength, and $\alpha = .78$ for flexibility.

Intention was assessed with two items, each using the phrase "Over the next month, I…to engage in". The two items were 1) "intend" and 2) "am motivated". *Intention* measures were reliable at $\alpha = 0.84$ for endurance, $\alpha = .74$ for strength, and $\alpha = .79$ for flexibility.

Table 2 Questionnaire Items

Behavioural Beliefs

"Over the next month, engaging in [Endurance][Strength][Flexibility] activities would…"

(1) "make me feel good"

(2) "take too much of my free time"

(3) "improve my physical appearance"

(4) "reduce my chances of getting injured"

(5) "improve my social life",

(6) "help me control my weigh"

(7) "get me out of the house on a regular basis"

(8) "reduce my chance of chronic disease"

(9) "help relieve my stress"

(10) "cause muscle soreness"

(11) "help maintain my independence".

Subjective Norm

"Over the next month most people who are important to me will…"

(1) "approve of me engaging in *[Endurance][Strength][Flexibility] activities*"

(2) "want me to engage in *[Endurance][Strength][Flexibility] activities*"

(3) "will be engaging in *[Endurance][Strength][Flexibility] activities*"

Normative Beliefs

"Over the next month...will approve of me engaging in [Endurance][Strength][Flexibility] activities"

(1) "my friends"

(2) "my family"

(3) "health professionals"

(4) "my spouse/romantic partner"

(5) "fitness class instructors/coaches"

(6) "my workout partner"

"Over the next month…will be engaging in [Endurance][Strength][Flexibility] activities

(1) "my friends"

(2) "my family"

(3) "health professionals"

(4) "my spouse/romantic partners"

(5) "fitness class instructors/coaches"

(6) "my workout partner".

Perceived Behavioural Control

"Over the next month…"

(1) "I have control over doing the following activities *[Endurance][Strength][Flexibility]* if I really wanted to"

(2) "if I really wanted to, doing the following activities *[Endurance][Strength][Flexibility]* would be up to me"

(3) "if I really wanted to, I am confident I could do the following activities *[Endurance][Strength][Flexibility]*"

Control Beliefs

"Over the next month…"

(1) "I have control over doing the following activities *[Endurance][Strength][Flexibility]* if I really wanted to"

(2) "if I really wanted to, doing the following activities *[Endurance][Strength][Flexibility]* would be up to me"

(3) " if I really wanted to, I am confident I could do the following activities *[Endurance][Strength][Flexibility]*"

(4) "despite other time commitments, if I really wanted to I could do the following activities *[Endurance][Strength][Flexibility]*"

(5) "despite the financial cost of the activity, if I really wanted to I could do the following activities *[Endurance][Strength][Flexibility]*"

6) "despite injury/other health issues if I really wanted to I could do the following activities *[Endurance][Strength][Flexibility]* "

(7) "despite no access to a gym / recreation center, if I really wanted to I could do the following activities *[Endurance][Strength][Flexibility]*"

(8) "despite not having a person to do the activity with, if I really wanted to I could do the following activities *[Endurance][Strength][Flexibility]* "

(9) "despite bad weather, if I really wanted to I could do the following activities *[Endurance][Strength][Flexibility]* "

(10) "despite not knowing proper technique if I really wanted to I could do the following activities *[Endurance][Strength][Flexibility]*"

(11) "despite having no physical chore or task to do, if I really wanted to I could do the following activities *[Endurance][Strength][Flexibility]*"

Following procedures of Ajzen (1991), aggregates of each of the belief types (*Behavioural*, *Normative*, and *Control*) were also calculated by taking the strength of each salient belief, and then combining it in a multiplicative fashion with the subjective evaluation of the belief's attribute, and finally summing the resulting products. Specifically, *Attitude* was calculated by multiplying each expectancy term by its associated value term, and then summing each of these products. *Subjective Norm* was calculated by multiplying the strength of each normative belief by the person's motivation to comply with the referent in question. *Perceived Behavioural Control* was calculated by multiplying each control belief by the perceived power of the particular control factor to facilitate or inhibit performance of the behaviour and then summing the resulting products.

Physical activity behaviours (endurance, strength, and flexibility) were measured using an adapted version (see Appendix G) of the Godin Leisure Time for Exercise Questionnaire (GLTEQ) (Godin & Shephard, 1985). The original GLTEQ consists of open-ended questions pertaining to the frequency of physical activity by intensity including activity and intensity descriptors. This questionnaire is quick and easy to administer, and is easily understood. The adapted version of the GLTEQ used in this thesis consisted of open-ended assessments of frequencies for endurance, strength, and flexibility activities, using the activity descriptors, intensity of the activities (strenuous, moderate, or mild), and the duration of each of Health Canada's recommended physical activity types. The GLTEQ was specifically chosen over other physical activity questionnaires, as evidence for its reliability has been demonstrated in prior research (Jacobs, Ainsworth, Hartman, & Leon, 1993). When conducting a simultaneous evaluation of ten commonly used physical activity questionnaires, Jacobs et al. (1993) found the GLTEQ to be reliable, and to operate exceptionally well when applied with a study employing a

one-month time frame, such as in this thesis. The adapted version of the GLTEQ used in this thesis was unlimited in its variability. Due to the fact that items were open-scaled, possible ceiling effects were avoided. Furthermore, the adapted version of the GLTEQ used in this thesis was unlimited in its sensitivity to behavioural change. By using open-scaled items, I was able to assess change not only by looking at behaviour frequencies, but also at the products of behaviour frequency and behaviour duration.

Statistical Analysis

All analyses were conducted using SPSS version 12.0 for Windows, and all data was coded, cross-checked, and cleaned to ensure the removal of outliers. Outliers were removed by deleting any people with z-scores of 3.3 or higher. As z-scores of 3.3 or higher are completed outside of the normal distribution curve, and results of this thesis were based on the normal distribution curve, these scores were removed to insure that they were not biasing the data in any way. The removal of outliers was done prior to the conduction of any statistical analyses.

An initial analysis was conducted to examine whether or not the two groups (experimental and control) differed significantly with respect to demographic variables. Gender was found to be the only significant ($p = .05$), and differing variable between the two groups, and consequently gender was included as a covariate for the remainder of our analyses. As t-tests cannot be calculated when a covariate is present, F-tests were conducted instead.

Hypothesis 1 was analyzed using a simple Analysis of Covariance (ANCOVA) (Dependent Variable = Theory of Planned Behaviour constructs) to determine if individuals exposed to the guide differed from individuals who were not exposed to the guide in terms of their beliefs towards physical activity. This simple ANCOVA was then followed by a 2

(condition) X 2 (grouping variable of interest) Factorial ANCOVA (DV = Theory of Planned Behaviour constructs) to determine if activity level and age interacted with the guide.

Hypothesis 2 was analyzed using 2 (condition) X 2 (time) RM ANCOVA (Dependent Variable = physical activity intentions and behaviours) to determine if individuals exposed to the guide differed from individuals who were not exposed to the guide in terms of changing their physical activity intentions and behaviours.

Provided that the results were significant for Hypothesis 2, Hypothesis 3 was to be analyzed using hierarchical ordinary least squares multiple regression analysis to determine if changes in intention and behaviour were mediated by Theory of Planned Behaviour variables.

After conducting all appropriate ANCOVAs, I further probed each significant interaction with follow-up F- tests. (While keeping gender as a covariate) I tested to see whether or not these interactions were significant among those who were previously inactive according to Health Canada's guidelines, and to see whether or not they were significant among older adults.

Participants were dichotomized as physically active or physically inactive according to Health Canada's guidelines (1999). To be considered physically active, participants needed to be engaging in a minimum of 30 minutes of endurance activities at least four days of the week at a moderate intensity, strength activities a minimum of two days of the week, and flexibility activities a minimum of four days of the week.

Participants were dichotomized as young or old by deeming younger adults as anyone between the ages of 18 and 64 years of age, and by deeming older adults as anyone aged 65 years and older. The rationale for this cut-off is that the older adult guide is intended for people aged 65 years and older

Due to my small sample size (N = 130), I set my p value to .05 as originally planned, but I also flagged statistics at $p < .10$. This additional procedure was considered because my sample size was lower than anticipated. Effect sizes are less variant to sample size than are p-vales, and for this reason, both p-values and effect sizes are shown. Results were interpreted using Cohen's (1977) effect size Eta squared (η^2) for small (.01), medium (.06), and large (.14) effects, and the significance criterion of $p < .10$. Following Cohen's (1977) discussion of effect size, I considered effects of a medium effect size or greater as particularly meaningful, because they represent effects typically observed by the naked eye. Nevertheless, small effect sizes are still important to large scale public health campaigns (Rutledge & Low, 2004).

CHAPTER 3: RESULTS, DISCUSSION, AND CONCLUSION

Results

Attitude and Behavioural Beliefs

Endurance

Results of the effect of the guide on attitudes and behavioural beliefs can be found in Table 3 and Table 8. No main effects were present for attitudes or behavioural beliefs (individual or aggregate) among either group ($p > .10$). Investigation of the interaction between the guide and activity status for attitude (affective and instrumental) and the aggregate behavioural beliefs identified a significant interaction with the aggregate behavioural beliefs ($F_{2,112} = 6.65$, $p < .01$, $\eta^2 = 0.05$). When I further probed this interaction with follow-up F- tests, main effects were present for participants not meeting Health Canada's physical activity guidelines ($F_{1,44} = 3.94$, p Participants not meeting Health Canada's physical activity guidelines who received the guide showed greater mean values ($M = 14.27$, $SD = 3.83$) than participants who did not receive the guide ($M = 12.22$, $SD = 3.01$) (see Figure 1).

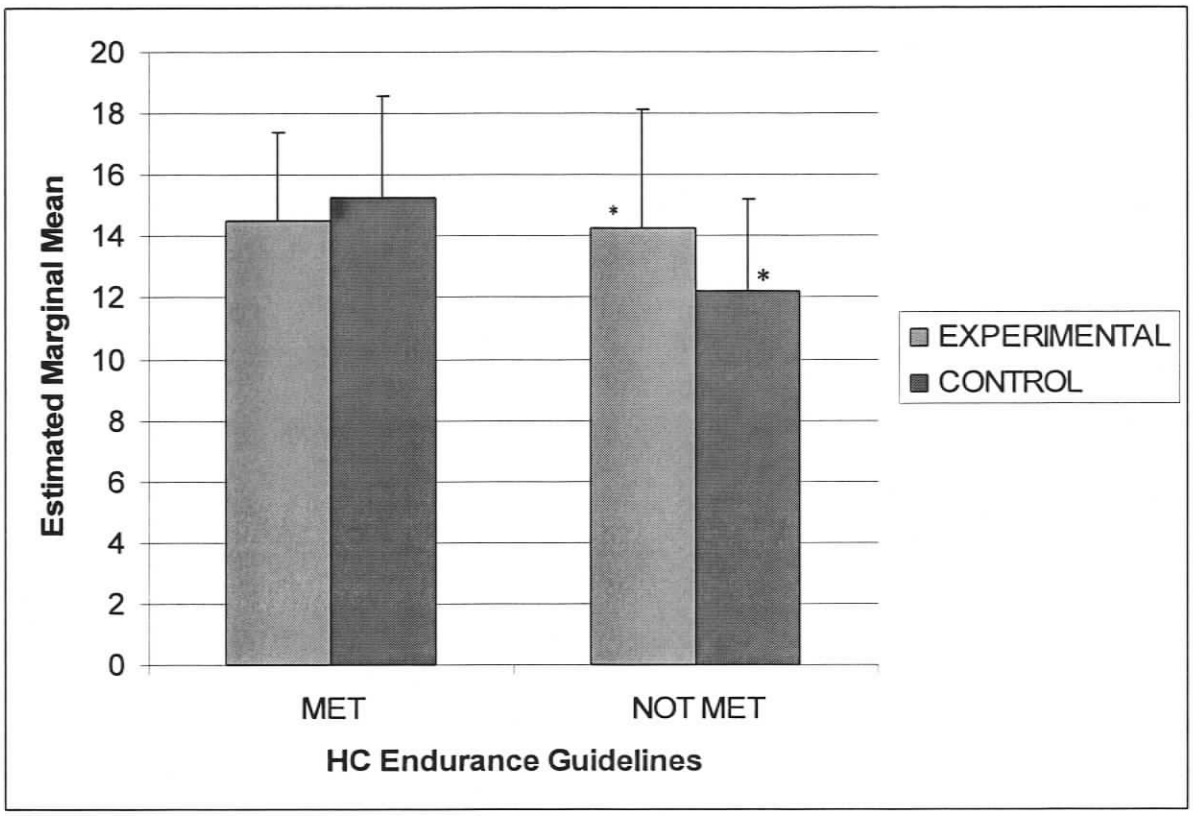

Figure 1. Effect of activity status and condition on aggregate endurance beliefs
Note: * = where significant interaction occurs

Evaluation of the guide x activity status interaction also showed that five of the 11 specific behavioural beliefs were different. These were "feel good" ($F_{11,96} = 2.86$, $p < .10$, $\eta^2 = 0.03$), "improve social life" ($F_{11,96} = 7.81$, $p = .01$, $\eta^2 = 0.07$), "control weight" ($F_{11,96} = 6.12$, $p < .05$, $\eta^2 = 0.05$), ""reduce chronic disease" ($F_{11,96} = 3.74$, $p < .10$, $\eta^2 = 0.03$), and "relieve stress" ($F_{2,114} = 3.82$, $p < .10$, $\eta^2 = 0.04$). Of these five interactions, only three showed significant ($p < .10$) main effects when the interaction was evaluated with specific follow-up F- tests. Two of the three main effects were present among participants meeting Health Canada's physical activity guidelines. These were with "improve social life" ($F = 7.80$, $p < .01$, $\eta^2 = .10$), and "reduce chronic disease" ($F = 3.83$, $p = .05$, $\eta^2 = .05$). In the case of "improve social life", mean values were lower for those who received the guide than for those who did not receive the guide

(respectively, M = 8.06, SD = 4.11, and M = 10.78, SD = 5.15). Similarly, in the case of "reduce chronic disease", mean values were lower for those who received the guide than for those who did not receive the guide (respectively, M = 15.29, SD = 5.85, and M = 18.24, SD = 5.47). The third main effect was present for "control weight", and was found among participants not meeting Health Canada's physical activity guidelines ($F = 7.49$, $p < .01$, $\eta^2 = .16$). Specifically, mean values were higher in participants who received the guide (M = 18.91, SD = 4.70) compared to those who did not receive the guide (M = 14.24, SD = 6.00).

When the interaction between age and attitude (affective and instrumental), and the aggregate behavioural beliefs was analyzed, a significant interaction was present between age and affective attitude (($F_{2,114} = 2.96$, $p < .10$, $\eta^2 = 0.03$). Upon further probing of this interaction through a follow-up F- test, there were no main effects found present among either the younger adults or the older adults ($p > .10$).

Finally, evaluation of the age x guide interaction showed that one of the 11 specific behavioural beliefs was different. A significant interaction was revealed for "reduce chronic disease" ($F_{11,97} = 2.69$, $p < .10$, $\eta^2 = 0.02$), and when this interaction was evaluated with specific follow-up F- tests, a main effect was found to be present among older adults ($F_{1,46} = 3.41$, $p < .10$, $\eta^2 = .09$). Specifically, mean values were lower among older adults who received the guide (M = 15.29, SD = 5.85) compared to older adults who did not receive the guide (M = 18.24, SD = 5.47) (see Figure 2).

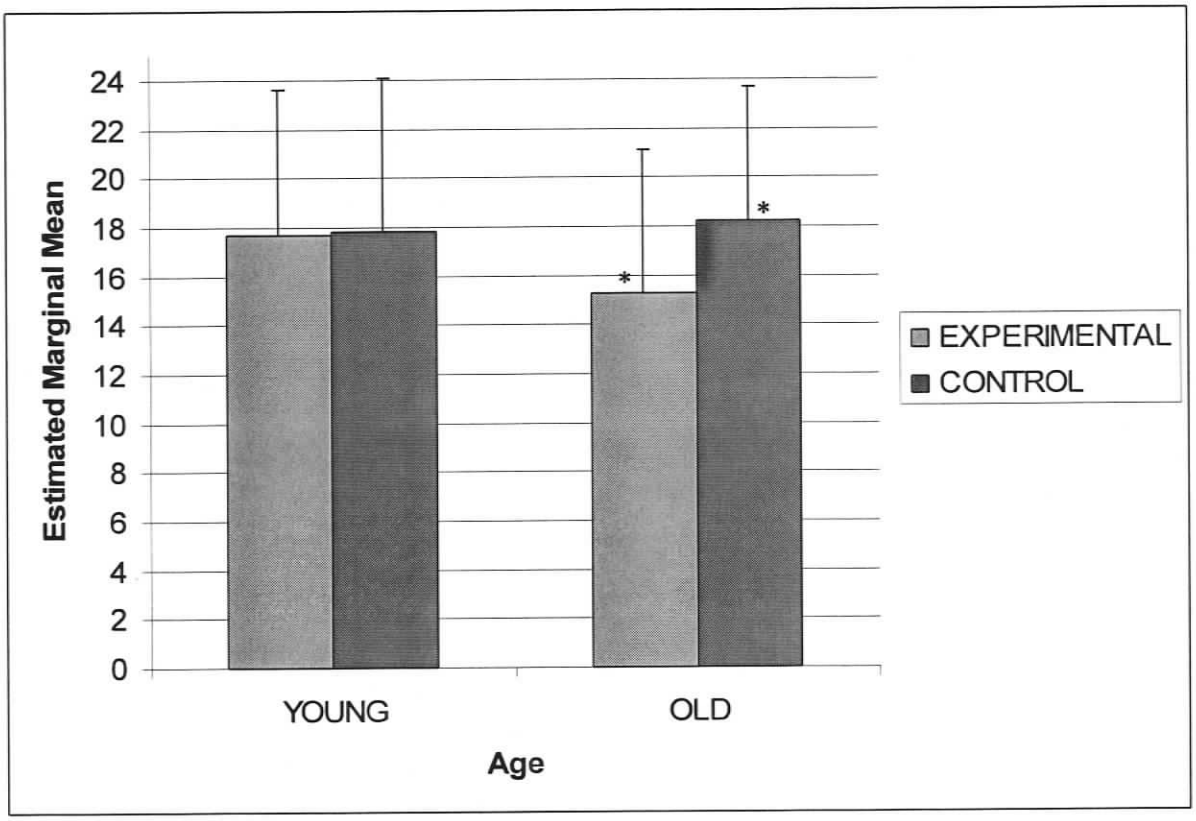

Figure 2. Effect of age and condition on the belief that endurance activity will reduce chronic disease
Note: * = where significant interaction occurs

Strength

Results of the effect of the guide on attitude and behavioural beliefs can be found in Table 3 and Table 8. Similar to endurance, no main effects were found for attitude or behavioural beliefs (individual or aggregate) among either group ($p < .10$). Investigation of the interaction between the guide and activity status for attitude (affective and instrumental) and the aggregate behavioural beliefs identified significant interactions with instrumental attitude and with the aggregate behavioural beliefs (respectively, ($F_{2,115} = 5.19$, $p < .05$, $\eta^2 = 0.04$, and, $F_{2,115} = 4.83$, $p < .05$, $\eta^2 = 0.04$).

When I further probed the guide x instrumental attitude interactions with a follow-up F-test, a main effect was revealed for participants not meeting Health Canada's physical activity guidelines ($F_{1,59} = 4.23$, $p < .05$, $\eta^2 = 0.09$) (see Figure 3).

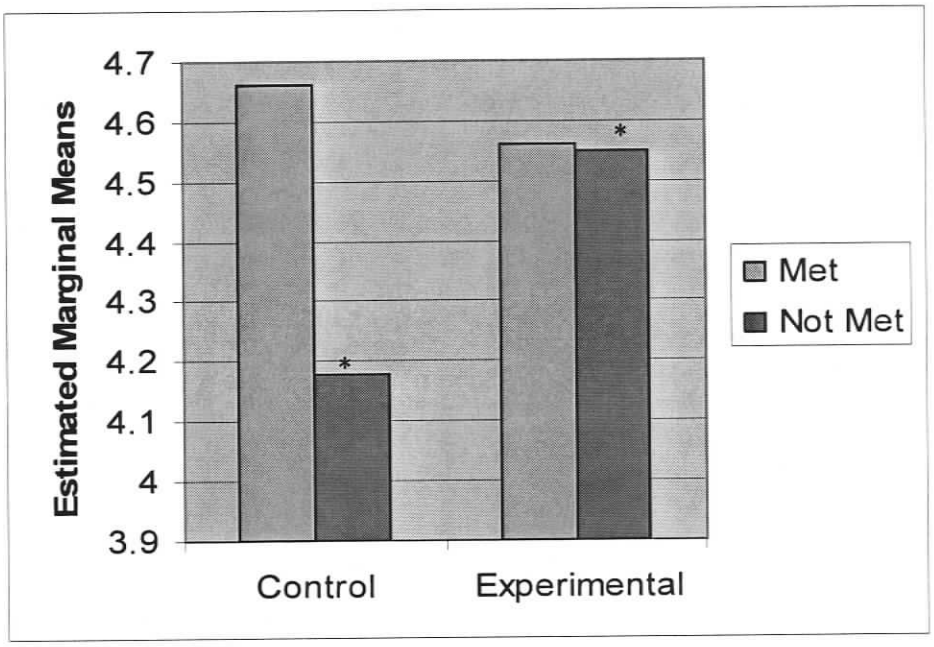

Figure 3 Effect of activity status and condition on instrumental attitude towards strength activity
Note: * = where significant interaction occurs

A follow-up F-test analysis of the guide x behavioural belief interaction revealed that main effects were present for participants not meeting Health Canada's physical activity guidelines ($F_{1,62} = 3.91$, $p = .05$, $\eta^2 = 0.06$). Participants not meeting Health Canada's physical activity guidelines who did not receive the guide showed lower mean values ($M = 11.94$, $SD = 2.65$) than participants who received the guide ($M = 13.57$, $SD = 3.54$).

Evaluation of the guide x activity status interaction also showed that two of the 11 specific behavioural beliefs were different. These were "get out of the house" ($F_{11,93} = 7.20$, $p < .01$, $\eta^2 = 0.07$) and "relieve stress" ($F_{11,93} = 7.61$, $p < .01$, $\eta^2 = 0.07$). Follow-up F-tests were conducted in order to further probe these interactions. Among participants meeting Health Canada's physical activity guidelines, main effects were present with "get out of the house" (F

$_{1,55} = 8.33$, $p < .01$, $\eta^2 = 0.13$) and with "relieve stress" ($F_{1,56} = 3.43$, $p < .10$, $\eta^2 = 0.06$). With "get out of the house", and with "relieve stress", participants who received the guide showed lower mean values (respectively, M = 3.56, SD = 0.89, and M = 4.00, SD = 0.92) than those who did not receive the guide (respectively, M = 4.13, SD = 0.92 , and M = 4.38, SD = 0.79)

No significant main effects were found amongst participants not meeting Health Canada's physical activity guidelines ($p > .10$).

When the interaction between age and attitude (affective and instrumental), and the aggregate behavioural beliefs was analyzed, a significant interaction was present between age and instrumental attitude, and between age and behavioural beliefs (respectively, $F_{2,117} = 4.65$, $p < .05$, $\eta^2 = 0.04$, and $F_{2,117} = 3.53$, $p < .10$, $\eta^2 = 0.03$). Upon further probing of these interactions through follow-up F-tests, there were no main effects found present among either the younger adults or the older adults ($p > .10$).

Finally, evaluation of the age x guide interaction showed that two of the 11 specific behavioural beliefs were different. A significant interaction was revealed for "control weight" ($F_{11,94} = 4.75$, $p < .05$, $\eta^2 = 0.04$), and when this interaction was evaluated with specific follow-up F-tests, a main effect was found to be present with younger adults ($F_{1,78} = 3.41$, $p < .10$, $\eta^2 = 0.04$). Specifically, greater mean values were seen among participants who received the guide than among participants who did not receive the guide (respectively, M = 4.24, SD = .79, and M = 3.89, SD = .83) (see Figure 4). A significant interaction was also revealed for "reduce chronic disease" ($F_{11,94} = 6.30$, $p < .05$, $\eta^2 = 0.06$), and when this interaction was further probed with follow-up F-tests, a main effect was present among older adults ($F_{1,38} = 6.10$, $p < .05$, $\eta^2 = 0.14$). Specifically, greater mean values were seen among participants who did not receive the guide

than among participants who received the guide (respectively, M = 4.15, SD = .83, and M = 3.47, SD = .83) (see Figure 5).

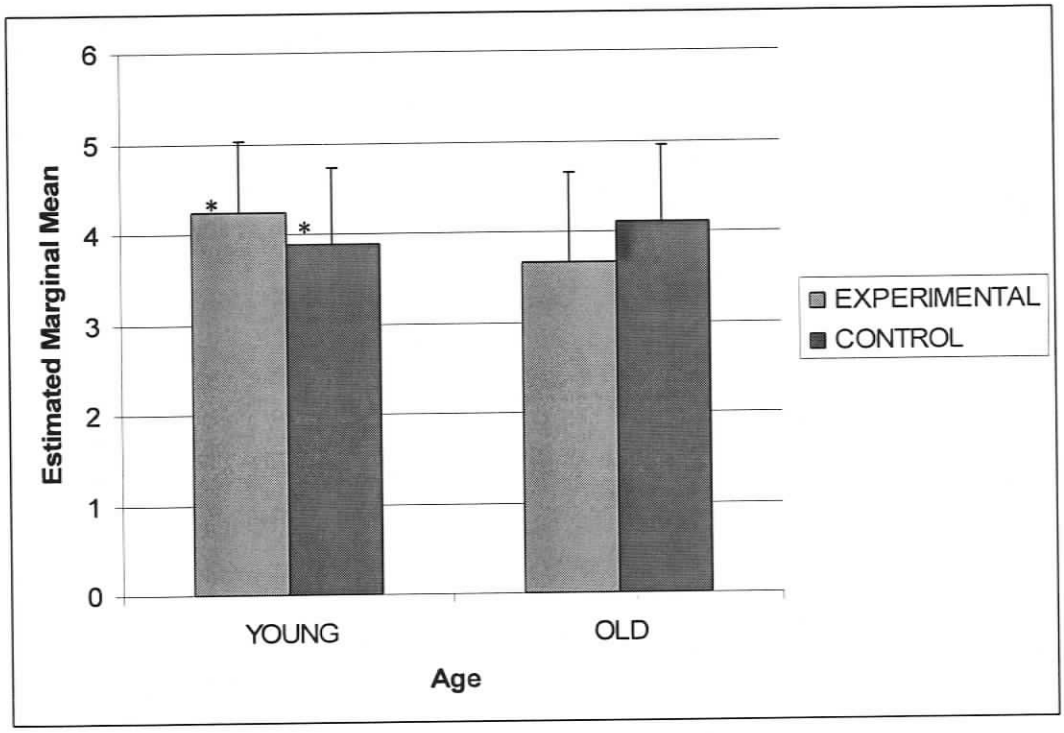

Figure 4. Effect of age and condition on the belief that strength activity will assist with weight control
Note: * = where significant interaction occurs

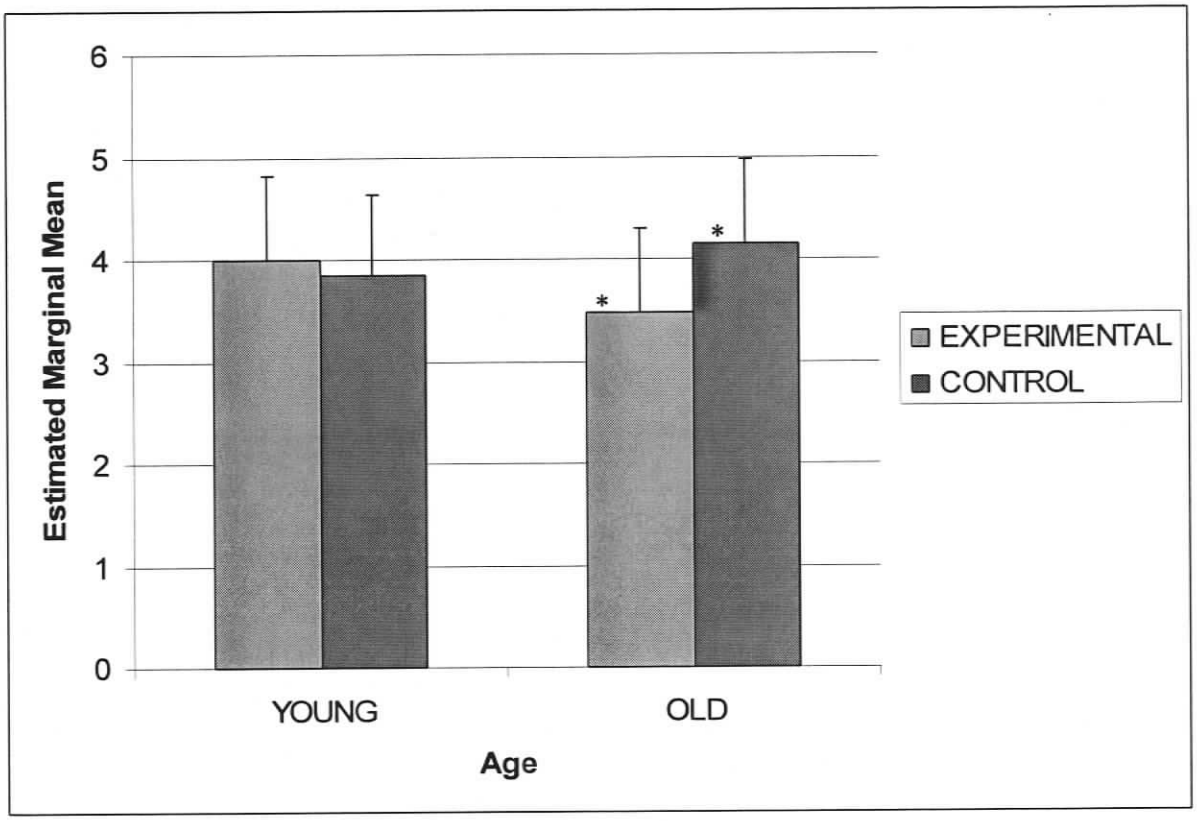

Figure 5. Effect of age and condition on the belief that strength activity will reduce chronic disease
Note: * = where significant interaction occurs

Flexibility

Results of the effect of the guide on attitude and behavioural beliefs can be found in Table 3 and Table 8. No main effects were present for attitudes or behavioural beliefs (individual or aggregate) among either group ($p > .10$). Investigation of the interaction between the guide and activity status for attitude (affective and instrumental), and the aggregate behavioural beliefs, identified no significant interactions with attitude or with the aggregate behavioural beliefs (individual or aggregate) among either group ($p < .10$).

A significant interaction was found between the two groups and "control weight" ($F_{11,96} = 8.43$, $p < .01$, $\eta^2 = 0.07$), with the experimental group showing higher mean values than the control group (respectively, M = 17.26, SD = 5.12, and M = 13.88, SD = 5.83). Specifically, the

experimental group rated "weight control" as being a more important outcome of physical activity than did the control group

When the interaction between age and attitude (affective and instrumental), and the aggregate behavioural beliefs was analyzed, no significant interactions were found present ($p > .10$).

Evaluation of the age x guide interaction showed that four of the 11 specific behavioural beliefs were different. These were "reduce injury" ($F_{11,93} = 3.00$ $p < .10$, $\eta^2 = 0.03$), "control weight" ($F_{11,93} = 5.60$, $p < .05$, $\eta^2 = 0.05$), "reduce chronic disease" ($F_{11,93} = 3.29$, $p < .10$, $\eta^2 = 0.03$), and "cause muscle soreness" ($F_{11,93} = 2.99$, $p < .10$, $\eta^2 = 0.03$), however, after further probing these interactions with follow-up F-tests, main effects were only found to be present with "reduce injury", and "control weight". With "reduce injury", the main effect was found with older adults ($F_{1,36} = 2.79$ $p = .10$, $\eta^2 = 0.07$), with higher mean values being seen among the control group ($M = 18.46$, $SD = 6.28$) than among the experimental group ($M = 15.20$, $SD = 5.91$) (see Figure 6). With "control weight", the main effect was found with younger adults ($F_{1,77} = 22.17$, $p < .01$, $\eta^2 = 0.22$), with higher mean values being seen among the experimental group ($M = 17.93$, $SD = 5.22$) than among the control group ($M = 12.40$, $SD = 4.89$) (see Figure 7).

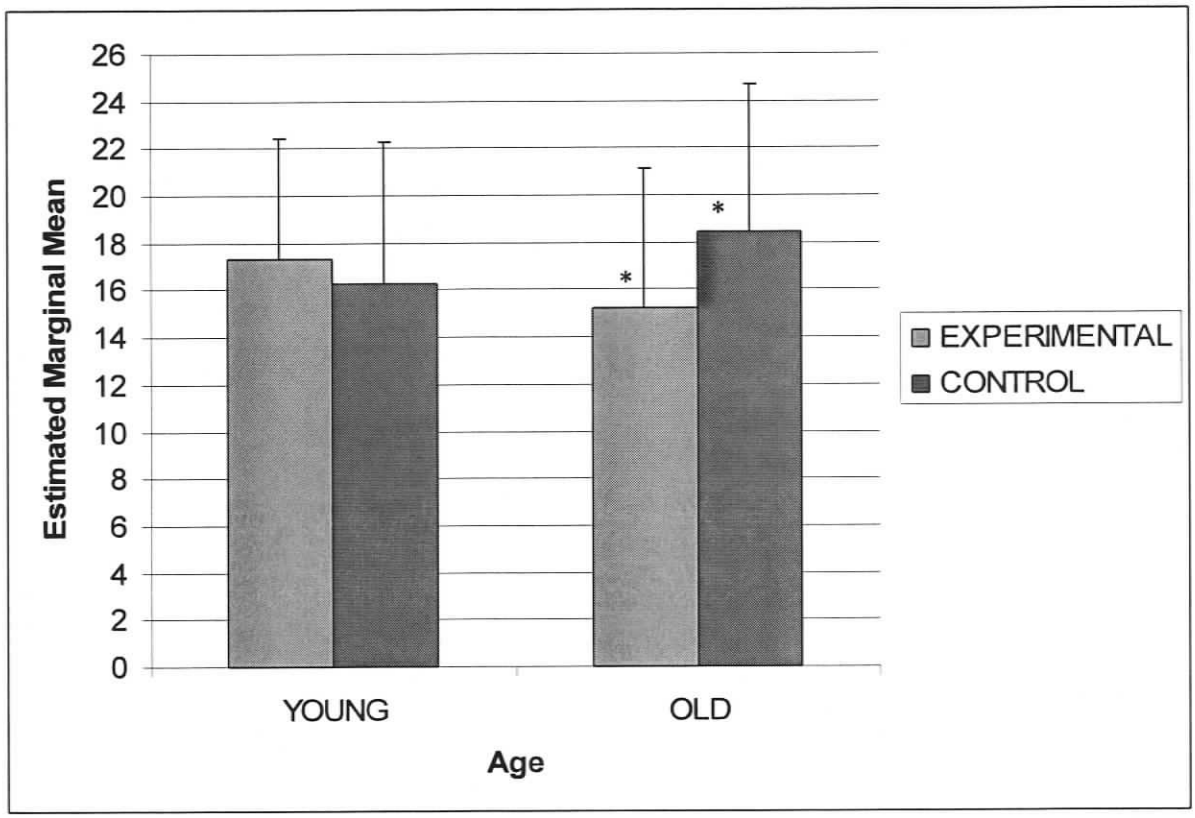

Figure 6. Effect of age and condition on the belief that flexibility activity will reduce injury
Note: * = where significant interaction occurs

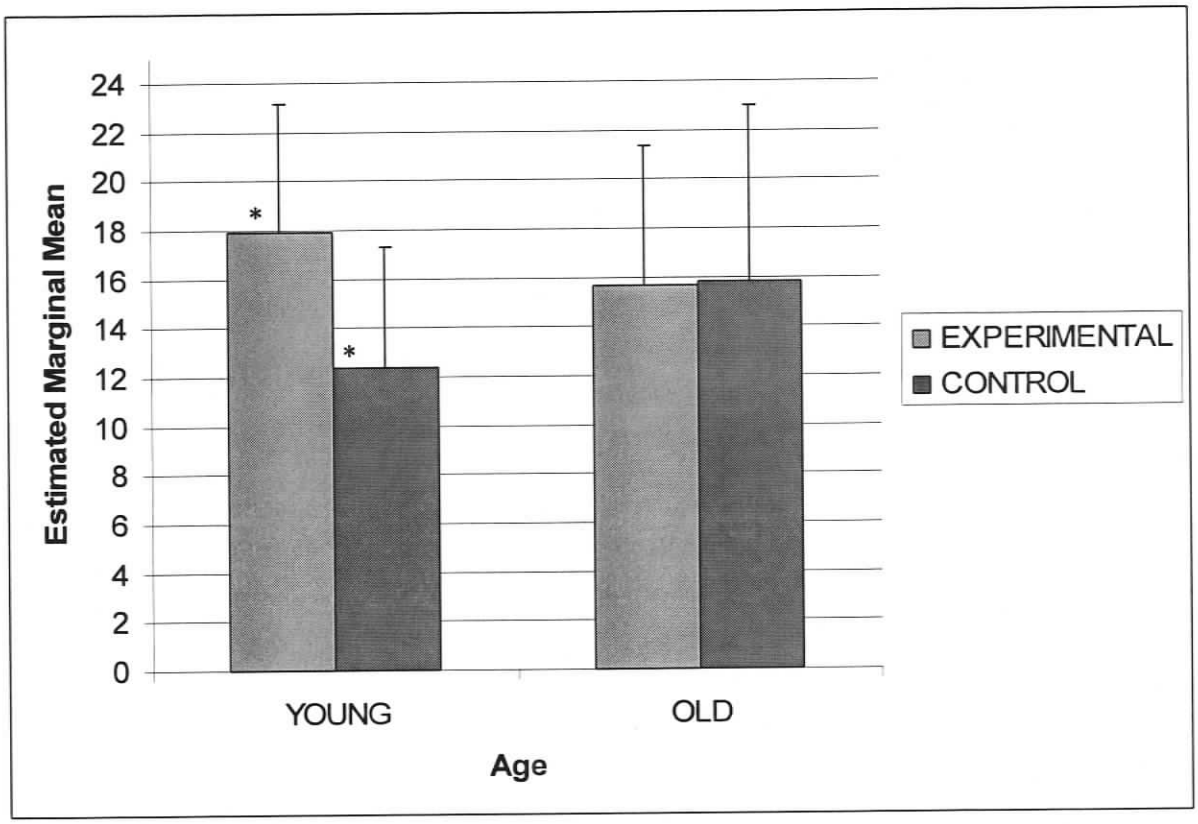

Figure 7. Effect of age and condition on the belief that flexibility activity will assist with weight control
Note: * = where significant interaction occurs

Subjective Norm and Normative Beliefs

Endurance

Results of the effect of the guide on subjective norm and normative beliefs can be found in Table 4 and Table 8. There was a significant main effect present for subjective norm ($F_{2,115} = 5.72$ $p < .05$, $\eta^2 = 0.05$), with higher mean values being present among participants who did not receive the guide ($M = 4.05$, $SD = 0.75$) compared with participants who received the guide ($M = 3.72$, $SD = 0.84$). Investigation of the interaction between the guide and activity status for subjective norm and the aggregate normative beliefs identified a significant interaction with subjective norm ($F_{2,111} = 7.31$, $p < .01$, $\eta^2 = 0.06$). When I further probed this interaction with

follow-up F- tests, a main effect was present for participants meeting Health Canada's physical activity guidelines ($F_{1,72} = 12.39$, $p < .01$, $\eta^2 = 0.14$), with lower mean values being present among participants who received the guide ($M = 3.69$, $SD = 0.88$) than among participants who did not ($M = 4.25$, $SD = 0.64$)

Evaluation of the guide x activity status interaction also showed that two of the six specific normative beliefs were different. These were "friends" ($F_{6,101} = 7.32$, $p < .01$, $\eta^2 = 0.07$), and "workout partner" ($F_{6,101} = 3.41$, $p = .10$, $\eta^2 = 0.03$). Both of these interactions showed significant ($p < .10$) main effects when the interactions were further evaluated with specific follow-up F- tests. Both main effects were present among participants not meeting Health Canada's physical activity guidelines. In the case of "friends" ($F_{1,38} = 3.16$, $p < .10$, $\eta^2 = 0.08$), mean values were lower for participants who did not receive the guide than for those who did receive the guide (respectively, $M = 10.42$, $SD = 3.72$, and $M = 13.55$, $SD = 6.67$). Similarly, in the case of "workout partner" ($F_{1,38} = 4.16$, $p < .05$, $\eta^2 = 0.10$), mean values were lower for participants who did not received the guide than for participants who did receive the guide (respectively, $M = 6.61$, $SD = 7.59$, and $M = 11.74$, $SD = 8.09$) (see Figures 8 and 9).

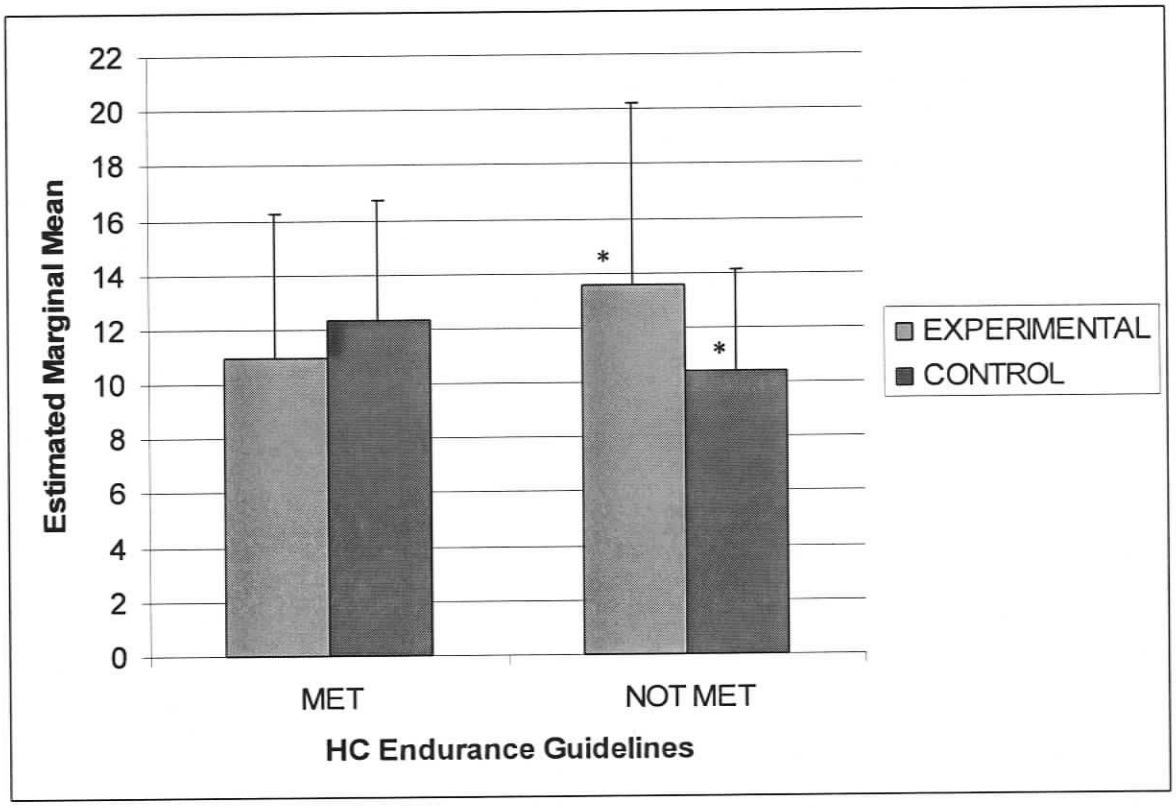

Figure 8. Effect of activity status and condition on the belief that endurance activity is valued by one's friends
Note: * = where significant interaction occurs

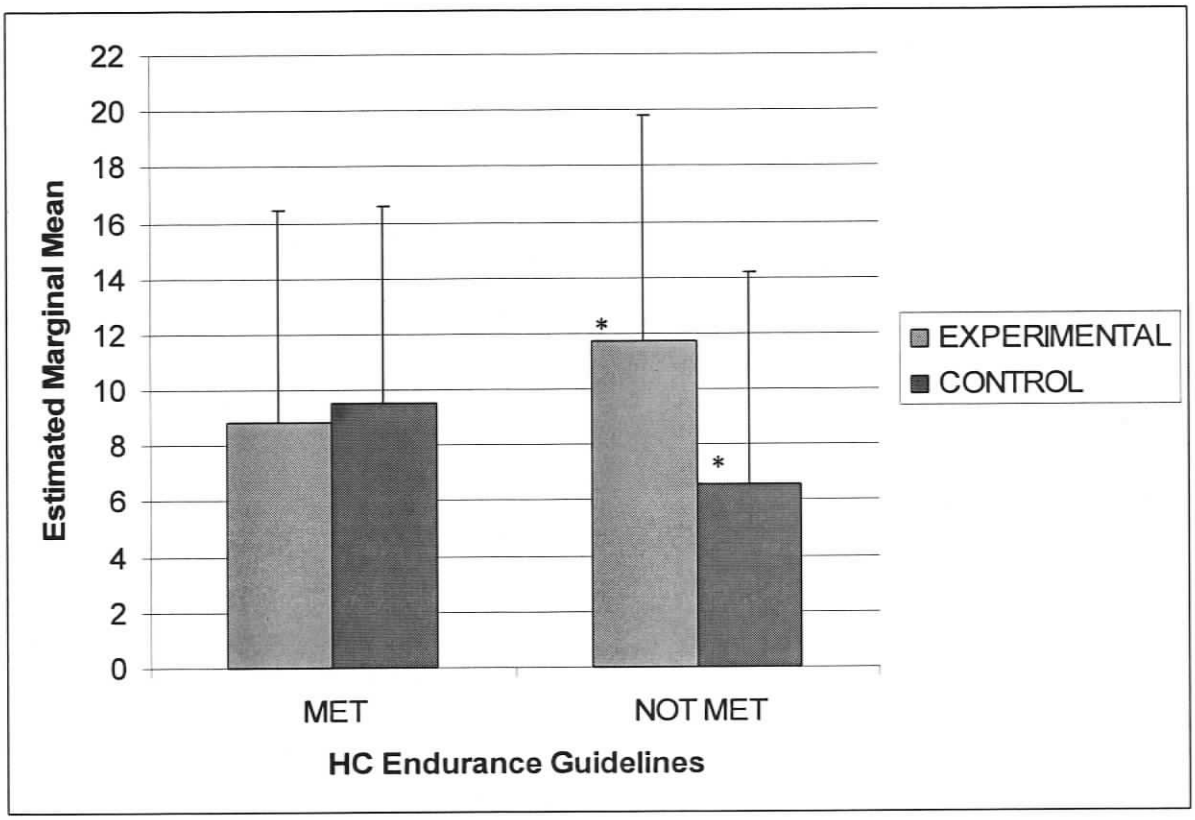

Figure 9. Effect of activity status and condition on the belief that endurance activity is valued by one's workout partner
Note: * = where significant interaction occurs

No significant interactions between age and subjective norm and the aggregate normative beliefs were found ($p > .10$), and an evaluation of the age x guide interaction showed that none of the six specific normative beliefs were different ($p > .10$).

Strength

Results of the effect of the guide on subjective norm and normative beliefs can be found in Table 4 and Table 8. No main effects were found for subjective norm or normative beliefs (individual or aggregate) among either group ($p < .10$). Investigation of the interaction between the guide and activity status for subjective norm and the aggregate normative beliefs identified

no significant interactions ($p > .10$). When the interaction between age and subjective norm and the aggregate normative beliefs was analyzed, no significant interactions were found ($p > .10$).

Finally, evaluation of the age x guide interaction showed that one of the six specific normative beliefs was different. A significant interaction was revealed for "health professionals" ($F_{6,105} = 5.62$, $p < .05$, $\eta^2 = 0.05$), and when this interaction was evaluated with a specific follow-up F-test, a main effect was found to be present with older adults ($F_{1,35} = 3.30$, $p < .10$, $\eta^2 = 0.10$). Specifically, mean values were higher among participants who did not receive the guide than among participants who did receive the guide (respectively, M = 18.40, SD = 5.52, and, M = 14.20, SD = 6.08) (see Figure 10).

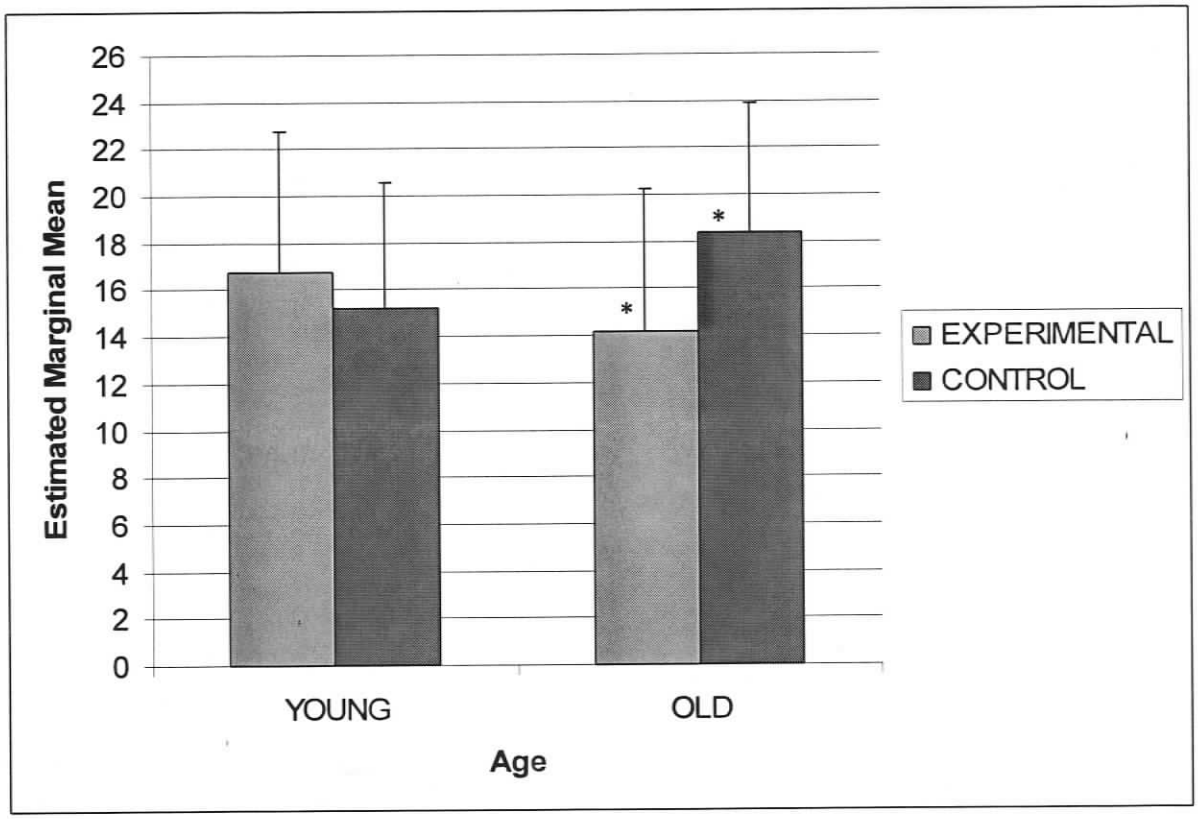

Figure 10. Effect of activity status and condition on the belief that strength activity is valued by one's health professional(s)
Note: * = where significant interaction occurs

Flexibility

Results of the effect of the guide on subjective norms and normative beliefs can be found in Table 4 and Table 8. No main effects were present for subjective norm or normative beliefs (individual or aggregate) among either group ($p > .10$). Investigation of the interaction between the guide and activity status for subjective norm and the aggregate normative beliefs identified a significant interaction with subjective norm ($F_{2,114} = 7.31$, $p < .01$, $\eta^2 = 0.06$). When I further probed this interaction with follow-up F- tests, a main effect was present for participants meeting Health Canada's physical activity guidelines ($F_{1,23} = 3.13$, $p < .10$, $\eta^2 = 0.12$). Participants who received the guide showed lower mean values ($M = 3.54$, $SD = 0.82$) than participants who did not receive the guide ($M = 4.03$, $SD = 0.82$).

Evaluation of the guide x activity status interaction showed that none of the six specific behavioural beliefs was different ($p > .10$).

When the interaction between age and subjective norm (and the aggregate normative beliefs was analyzed, no significant interactions were found ($p > .10$).

Finally, evaluation of the age x guide interaction showed one of the six specific normative beliefs was different. This was "health professionals" ($F_{6,101} = 2.75$, $p < .05$, $\eta^2 = 0.03$). When this interaction, however, was further probed with specific follow-up F-tests, no main effects were present ($p < .10$)

Perceived Behavioural Control and Control Beliefs

Endurance

Results of the effect of the guide on perceived behavioural control and control beliefs can be found in Table 5 and Table 8. No main effects were present for perceived behavioural control or control beliefs (individual or aggregate) among either group ($p > .10$). Investigation of the

interaction between the guide and activity status for perceived behavioural control and the aggregate control beliefs identified a significant interaction with the aggregate control beliefs ($F_{2,100} = 3.64$, $p < .10$, $\eta^2 = 0.03$). When I further probed this interaction with follow-up F- tests, no main effects were found present ($p > .10$).

Evaluation of the guide x activity status interaction also showed that two of the eight specific control beliefs were different. These were "having someone to do activity with" ($F_{8,93} = 3.92$, $p < .05$, $\eta^2 = 0.04$), and "knowing the proper technique" ($F_{8,93} = 3.96$, $p = .05$, $\eta^2 = 0.04$). Neither of these interactions showed significant main effects when they were further evaluated with specific follow-up F- tests ($p > .10$).

When the interaction between age and perceived behavioural control, and the aggregate control beliefs was analyzed, no significant interactions were present ($p > .10$).

Finally, evaluation of the age x guide interaction showed that none of the eight specific control beliefs was different ($p > .10$).

Strength

Results of the effect of the guide on perceived behavioural control and control beliefs can be found in Table 5 and Table 8. No main effects were present for perceived behavioural control or control beliefs (individual or aggregate) among either group ($p > .10$). Investigation of the interaction between the guide and activity status for perceived behavioural control and the aggregate control beliefs identified no significant interactions ($p > .10$).

Evaluation of the guide x activity status interaction showed that none of the eight specific control beliefs were different ($p > .10$).

When the interaction between age and perceived behavioural control, and the aggregate control beliefs was analyzed, no significant interactions were present ($p > .10$).

Finally, evaluation of the age x guide interaction showed that none of the eight specific control beliefs was different ($p > .10$).

Flexibility

Results of the effect of the guide on perceived behavioural control and control beliefs can be found in Tables 5 and Table 8. No main effects were present for perceived behavioural control or control beliefs (individual or aggregate) among either group ($p > .10$). Investigation of the interaction between the guide and activity status for perceived behavioural control and the aggregate control beliefs identified no significant interactions ($p > .10$).

Evaluation of the guide x activity status interaction showed that none of the eight specific control beliefs were different ($p > .10$).

When the interaction between age and perceived behavioural control, and the aggregate control beliefs was analyzed, no significant interactions were present ($p > .10$).

Finally, evaluation of the age x guide interaction showed that none of the eight specific control beliefs was different ($p > .10$).

Table 3 ANCOVA Values for Attitude

	Control	Experimental		Past PA Interaction		Age Interaction		
	M (SD)	M (SD)	F (1,120)	η^2	F (1,115)	η^2	F (1,117)	η^2
Endurance								
Affective Attitude	3.78 (1.00)	3.59 (0.98)	0.84	.00	0.00	.00	2.39	.02
Instrumental Attitude	4.54 (0.54)	4.58(0.46)	0.13	.00	0.71	.01	1.44	.01
Behavioural Beliefs	14.25(3.58)	14.41(3.21)	0.01	.00	6.65**	.05	0.14	.00
Strength								
Affective Attitude	3.45 (0.92)	3.37 (0.95)	0.35	.00	1.31	.05	1.56	.01
Instrumental Attitude	4.44 (0.65)	4.53(0.55)	0.39	.00	5.19*	.04	4.65*	.04
Behavioural Beliefs	13.64(3.20)	13.93(3.38)	0.02	.00	5.48*	.04	0.50	.00
Flexibility								
Affective Attitude	3.52 (0.87)	3.62 (0.93)	0.09	.00	0.00	.00	1.89	.02
Instrumental Attitude	4.43 (0.60)	4.54(0.55)	0.80	.01	0.17	.00	0.23	.00
Behavioural Beliefs	13.56(3.41)	14.24(3.43)	0.45	.00	0.01	.00	1.04	.01

Notes: *p<.05 one-tailed. **p<.01 one-tailed
Past PA Interaction: People who were previously physically active according to Health Canada's standards
Age Interaction: People who were at least 60 years of age compared to those under 60

Table 4 ANCOVA Values for Subjective Norm

	Control	Experimental			Past PA Interaction		Age Interaction	
	M (SD)	M (SD)	F (1,116)	η^2	F (1,115)	η^2	F (1,115)	η^2
Endurance								
Subjective Norm	4.05 (0.73)	3.72 (0.84)	5.79*	.05	7.31**	.06	0.57	.01
Normative Beliefs	13.26 (4.34)	12.54(4.62)	0.53	.00	1.69	.02	0.07	.00
Strength								
Subjective Norm	3.85 (0.75)	3.59 (0.78)	4.91*	.04	0.19	.00	3.33	.03
Normative Beliefs	12.97 (4.18)	12.21 (4.66)	0.78	.01	0.17	.00	1.45	.01
Flexibility								
Subjective Norm	3.87 (0.70)	3.68 (0.77)	3.27	.03	0.56	.01	0.40	.00
Normative Beliefs	12.55 (4.76)	12.79 (4.89)	0.09	.00	0.07	.00	0.37	.00

Notes: *p<.05 one-tailed. **p<.01 one-tailed
Past PA Interaction: People who were previously physically active according to Health Canada's standards
Age Interaction: People who were at least 60 years of age compared to those under 60

Table 5 ANCOVA Values for Perceived Behavioural Control

	Control M (SD)	Experimental M (SD)	F (1,117)	η^2	Past PA Interaction F (1,116)	η^2	Age Interaction F (1,116)	η^2
Endurance								
Perceived Behavioural Control	4.43 (0.56)	4.38 (0.66)	0.31	.00	0.19	.00	0.53	.01
Control Beliefs	15.13 (4.03)	14.72 (4.41)	0.24	.00	4.13*	.04	0.28	.00
Strength								
Perceived Behavioural Control	4.44 (0.54)	4.33 (0.73)	0.87	.01	0.81	.01	2.11	.02
Control Beliefs	15.22 (3.57)	14.11 (4.55)	1.79	.02	0.01	.00	0.93	.01
Flexibility								
Perceived Behavioural Control	4.42 (0.56)	4.42 (0.64)	0.00	.00	1.85	.02	0.00	.00
Control Beliefs	15.18 (3.98)	15.09 (4.45)	0.02	.00	1.95	.02	0.32	.00

Notes: *p<.05 one-tailed. **p<.01 one-tailed
Past PA Interaction: People who were previously physically active according to Health Canada's standards
Age Interaction: People who were at least 60 years of age compared to those under 60

Table 6 Intention

	Time 1		Time 2					
	Control	Experimental	Control	Experimental	Group		Time X Group	
	M (SD)	M (SD)	M (SD)	M (SD)	F	η^2	F	η^2
Endurance	4.23 (0.84)	3.91 (0.92)	4.10 (1.04)	3.76 (1.02)	2.44	0.03	0.03	0.00
Strength	3.77 (1.08)	3.74 (1.02)	3.70 (1.21)	3.47 (1.22)	0.53	0.01	0.40	0.01
Flexibility	3.56 (1.13)	3.84 (1.00)	3.26 (1.17)	3.53 (1.17)	0.55	0.01	0.01	0.00

Note: †p<.10 one-tailed *p<.05 one-tailed.**p<.01 one-tailed

Table 7 Behaviour

	Time 1		Time 2					
	Control	Experimental	Control	Experimental	Group		Time X Group	
	M (SD)	M (SD)	M (SD)	M (SD)	F	η^2	F	η^2
Endurance								
Strenuous	114.59 (182.16)	106.91 (127.00)	97.96 (123.79)	77.68 (92.08)	0.29	0.00	0.22	0.00
Moderate	96.16 (91.46)	126.62 (104.33)	173.88 (179.60)	149.56 (146.94)	0.06	0.00	1.49	0.02
Mild	115.41 (198.18)	172.65 (333.46)	97.96 (123.79)	77.68 (92.08)	0.12	0.00	1.04	0.01
Strenuous + Moderate	212.76 (200.60)	233.53 (180.57)	271.84 (228.89)	227.24 (184.36)	0.05	0.00	1.80	0.02
Total Minutes	328.16 (254.11)	406.18 (419.65)	373.49 (242.10)	368.41 (382.27)	0.27	0.00	1.08	0.01
Strength	71.84 (110.47)	81.32 (85.68)	68.06 (63.45)	116.47 (195.58)	1.80	0.02	1.78	0.02
Flexibility	35.69 (49.78)	32.53 (48.32)	47.00 (71.65)	38.38 (52.87)	1.33	0.02	0.93	0.01

Note: †p<.10 one-tailed *p<.05 one-tailed.**p<.01 one-tailed

Table 8 MANCOVA values

	Intention to Treat				HC interaction				Age interaction			
	Wilk's λ	df	F	η^2	Wilk's λ	df	F	η^2	Wilk's λ	df	F	η^2
Attitude Aggregates												
Endurance	0.98	3,115	0.78	0.02	0.95	3,110	2.00	0.05	0.94	3,112	2.40	0.06
Strength	0.99	3,118	0.39	0.01	0.94	3,113	2.67	0.07	0.9	3,115	4.30	0.10
Flexibility	0.99	3,117	0.32	0.01	0.99	3,112	0.08	0.00	0.95	3,114	1.88	0.05
Subjective Norm Aggregates												
Endurance	0.95	2,115	2.98**	0.05	0.94	2,111	3.75**	0.06	1.00	2,112	0.29	0.01
Strength	0.96	2,118	2.27	0.04	1.00	2,114	0.85	0.00	0.97	2,115	1.67	0.03
Flexibility	0.97	2,113	1.80	0.03	0.99	3,112	0.85	0.02	0.99	3,114	0.66	0.01
Perceived Behavioural Control Aggregates												
Endurance	1.00	2,113	0.12	0.00	0.96	2,108	2.13	0.04	1.00	2,110	0.18	0.00
Strength	0.99	2,116	0.86	0.02	0.99	2,111	0.37	0.01	0.98	2,113	1.29	0.02
Flexibility	1.00	2,113	1.29	0.02	0.98	2,111	1.04	0.02	1.00	2,113	0.23	0.00
Behavioural Beliefs												
Endurance Expectancies	0.91	11,106	0.91	0.09	0.86	11,102	1.56	0.14	0.89	11,103	1.12	0.11
Endurance Values	0.97	11,108	0.36	0.04	0.92	11,104	0.83	0.08	0.89	11,105	1.20	0.11
Endurance Expectancy X Values	0.93	11,100	0.73	0.07	0.86	11,96	1.41	0.14	0.86	11,97	1.43	0.14
Flexibility Expectancies	0.79	11,103	2.45***	0.21	0.91	11,99	0.92	0.09	0.86	11,100	1.49	0.14
Flexibility Values	0.97	11,108	0.36	0.04	0.92	11,104	0.78	0.08	0.89	11,105	1.20	0.11
Flexibility Expectancy X Value	0.83	11,96	1.73*	0.17	0.92	11,92	0.75	0.08	0.83	11,93	1.71*	0.17
Strength Expectancies	0.93	11,102	0.71	0.07	0.85	11,98	1.57	0.15	0.87	11,99	1.39	0.13
Strength Values	0.97	11,108	0.36	0.04	0.91	11,104	0.95	0.09	0.89	11,105	1.20	0.11
Strength Expectancy X Values	0.92	11,97	0.78	0.08	0.87	11,93	1.24	0.13	0.84	11,94	1.68*	0.16
Normative Beliefs												
Endurance Expectancies	0.95	6,106	1.03	0.06	0.91	6,102	1.69	0.09	0.95	6,103	0.85	0.05
Endurance Expectancy X Values	0.95	6,105	0.87	0.05	0.90	6,101	1.80	0.10	0.94	6,102	1.12	0.06
Endurance Values	0.94	7,113	0.98	0.06	0.93	7,110	1.17	0.07	0.93	7,110	1.22	0.07
Flexibility Expectancy X Values	0.93	6,104	1.29	0.07	0.97	6,100	0.44	0.03	0.94	6,101	1.00	0.06
Flexibility Values	0.94	7,113	0.98	0.06	0.93	7,110	1.20	0.07	0.93	7,110	1.22	0.07
Flexibility Expectancies	0.92	6,105	1.53	0.08	0.94	6,101	1.02	0.06	0.96	6,102	0.73	0.04
Strength Expectancies	0.94	6,110	1.21	0.06	0.96	6,106	0.81	0.04	0.91	6,107	1.75	0.09
Strength Expectancy X Values	0.94	6,108	1.14	0.06	0.98	6,104	0.44	0.03	0.91	6,105	1.68	0.09
Strength Values	0.94	7,113	0.98	0.06	1.00	7,110	0.06	0.04	0.93	7,110	1.22	0.07

Control Beliefs												
Endurance Expectancies	0.87	8,101	1.96	0.13	0.97	8,97	-0.39	0.03	0.97	8,98	0.42	0.03
Endurance Expectancy X Values	0.89	8,97	1.53	0.11	0.89	8,93	1.42	0.11	0.96	8,94	0.49	0.04
Endurance Values	0.90	8,111	1.57	0.10	0.90	8,107	1.55	0.10	1.00	8,109	0.07	0.01
Flexibility Expectancy X Values	0.94	8,96	0.77	0.06	0.91	8,92	1.09	0.09	0.97	8,94	0.31	0.03
Flexibility Values	0.90	8,111	1.57	0.10	0.93	8,107	1.07	0.07	1.00	8,108	0.07	0.01
Flexibility Expectancies	0.91	8,101	1.27	0.09	0.94	8,97	0.79	0.06	0.96	8,99	0.47	0.04
Strength Expectancies	0.87	8,100	1.80	0.13	0.95	8,96	0.62	0.05	0.95	8,97	0.62	0.05
Strength Expectancy X Values	0.89	8,95	1.42	0.11	0.93	8,91	0.89	0.07	0.95	8,92	0.57	0.05
Strength Values	0.9	8,11	1.57	0.1	1.95	8,107	0.69	0.05	1	8,108	0.07	0.01

Note: * = significant at $p < .10$
** = significant at $p < .05$
*** = significant at $p < .01$

Discussion

Even though the benefits of physical activity are well-documented a majority of Canadian adults are not engaging in enough physical activity to reap such benefits (Surgeon General, 1996; ACSM, 1998; Healthy People 2010, 2000; Health Canada, 2002; CFLRI, 2002).

Previous research (Cardinal & Sachs, 1995, 1996; Donovan & Owen, 1994; King et al., 1991, 1995; Marcus et al., 1992,1996, 1997, 1998b; Marcus, Owen, Forsyth, Cavill, & Fridinger, 1998a; Marshall, Leslie, Bauman, Marcus, & Owen, 2003; Marcus, 2003; Owen et al., 1987) has shown that print-based media is an effective medium in the promotion of physical activity. The results of this thesis add to the literature pertaining to the impact of print-based media on physical activity intentions and behaviour.

According to Health Canada (2003) research indicated that Canadians were unaware that physical inactivity was a serious risk factor for premature death, chronic disease, and disability, at a magnitude of risk comparable to that of smoking. Canadians were confused by all of the data and information available about physical activity and fitness, and wanted a valid and practical guide, similar to Canada's Food Guide to Healthy Eating that would help them judge how much physical activity they needed to be engaging in so as to achieve better or optimal health.

Through the creation of their guide, Health Canada has attempted to broaden the term "physical activity" to incorporate more than just traditional exercise. The guide provides a "rainbow of physical activities" that can help adults feel more energized (endurance activities), gain strength (strength activities), and improve their mobility (flexibility activities). Health Canada's guide includes information and strategies intended to increase motivation towards regular physical activity among adults and older adults, such as benefits and recommended

amounts of daily and weekly physical activity, and possible barriers and solutions to overcome these barriers. To date, this study is the first to test the effectiveness of Health Canada's physical activity guides as motivational instruments for physical activity.

Three separate objectives were to be tested. The first was to evaluate whether or not Health Canada's physical activity guide had an effect on constructs of the theory of planned behaviour. The second was to see whether or not being exposed to Health Canada's physical activity guide led to changes in physical activity intentions and behaviours over the course of one month. Finally, and only if the second objective was met, the third objective was to see whether or not any observed relationships between the guide and changes in physical activity intentions and behaviours were mediated by the Theory of Planned Behaviour. These three objectives and findings directly pertaining to them are listed and discussed in greater detail below.

When examining Attitude and Behavioural Beliefs, several findings were consistent with my first hypothesis. Again, my first hypothesis was that individuals exposed to the guide would have significantly higher means of Theory of Planned Behaviour constructs than individuals not exposed to the guide. These findings were all observed among participants who were not meeting Health Canada's physical activity standards, and are broken down by activity type. Where endurance activities were considered, I found that people who received the guide showed greater mean values in the aggregate behavioural beliefs than among people who did not receive the guide. I also found the "control weight" variable (one of the specific 11 behavioural beliefs) to differ across the experimental and control groups. As hypothesized, people who received the guide showed higher mean values in the "control weight" variable than people who did not receive the guide. It is important to note that the "control weight" variable showed a large effect (.16) in its interaction with the guide. According to Furnham, Badmin, and Sneade (2002), in

Western society, exercise is one of the primary strategies for altering one's body, and Garner et al. (1985) found that women, in contrast to men, exercise primarily in order to lose weight. My study supported this research

When strength activities were considered, I observed a medium-sized effect (.09) for the guide x instrumental attitude interaction, and found that participants who received the guide showed greater mean values in their cognitive beliefs surrounding strength activities than among participants who did not receive the guide. I also observed a small to medium-sized effect for the significant guide x aggregate behavioural belief interaction, with participants who did not receive the guide showing lower mean values in their aggregated behavioural beliefs surrounding strength activities than participants who did receive the guide. That is, the guide plays an important role in shaping peoples' beliefs surrounding the importance of engaging in strength training activities.

When examining Subjective Norm and Normative Beliefs, several findings were consistent with my first hypothesis. These findings were all observed among participants who were not meeting Health Canada's physical activity standards, and are broken down by activity type. Where endurance was considered, I found that when I evaluated the guide x activity status interaction, two of the six specific normative beliefs were different. These were "friends" (a medium-sized effect, .07), and "workout partner" (a small effect size, .05). That is, among participants who did not receive the guide, the belief that endurance activity is valued by one's friends and workout partner was not as strong as that among participants who did receive the guide.

Several findings for Attitude and Behavioural Beliefs, Subjective Norm and Normative Beliefs, and Perceived Behavioural Control and Control Beliefs were inconsistent with my first

hypothesis. These findings were all observed among participants who were previously meeting Health Canada's physical activity standards, and are broken down by activity type.

Where endurance activities were considered, I found that participants who received the guide showed lower mean values in the aggregate behavioural beliefs than participants who did not receive the guide, and that participants who received the guide showed lower mean values than participants who did not receive the guide when compared on the "improve social life" and "reduce chronic disease" variables (two of the 11 specific behavioural beliefs pertaining to physical activity). That is, the beliefs that engaging in endurance activities would improve one's social life, and aid in the prevention of chronic disease, actually decreased when already active people received the guide. Perhaps the guide had a negative motivational influence from previously active people not being convinced about the guide's contents. If people are already engaging in endurance activities equal to or beyond what is prescribed by Health Canada, reading the guide might, at best, serve as a reminder cue to engage in endurance activity. The guide's contents may be tailored more to beginner exercisers. Replication of this study with the inclusion of focus groups is thereby warranted, so as to gain insight from both active and inactive participants about why or why not an individual might or might not chose to use these guides on a regular basis.

Where strength activities were considered, I found that lower mean values of the aggregate behavioural beliefs were being shown among participants who received the guide than among participants who did not. I also looked at the interaction between the guide and each of the specific behavioural beliefs, and found two of the 11 specific behavioural beliefs to differ across the experimental and control groups. These were"get out of the house" (a medium-sized effect, .07), and "relieve stress" (a medium-sized effect, .07), and with both variables, mean

values were lower amongst the experimental group than among the control group. That is, participants who received the guide essentially did not believe that engaging in strength activities would assist with getting them out of the house for a while, or aid in the relief of their stress as much as participants who did not receive the guide believed it would. Unfortunately this finding cannot be easily explained at this point in time, and further research is warranted so as to gain further insight as to why individuals who receive the guide do not believe in its contents.

As I suggested earlier in my discussion when focusing on endurance, perhaps the guide had a negative motivational influence on previously active people not being convinced about the guide's contents. If people are already engaging in strength training activities equal to or beyond what is prescribed by Health Canada, reading the guide might, at best, serve as a reminder cue to engage in strength activity. The guide's contents are tailored more to beginner exercisers.

When examining Subjective Norm and Normative Beliefs, several findings were inconsistent with my first hypothesis. These findings were all observed among participants who were previously meeting Health Canada's physical activity standards, and are broken down by activity type. Where endurance activities were considered, I found Subjective Norm to differ across the two groups, with lower mean values being present among participants who received the guide than among participants who did not. As to why there would have been a significant difference between the two groups on the subjective norm variable at baseline is unknown and not easily explainable at this point.

Where flexibility activities were considered, when I looked at the interaction between the guide and previous activity status for subjective norm and the aggregate normative beliefs, a significant interaction was present with subjective norm (a medium-sized effect, 06), with lower mean values being seen among participants who received the guide than among participants who

did not. That is, participants who received the guide did not believe that important referent others would play a role in their engagement in flexibility activities as much as participants who did not receive the guide believed important referent others would. Unfortunately this finding is difficult to explain, and speculations cannot be easily made; however, as I mentioned earlier in this discussion (when referring to strength activities), further research is warranted so as to gain further insight as to why individuals who receive the guide do not believe in its contents.

When examining Perceived Behavioural Control and Control Beliefs, none of my findings appeared to be supportive of my first hypotheses. This is unfortunate considering that perceived behavioural control is one of the most important variables when predicting behaviour (Hagger et. al, 2002). It appears as though Health Canada's guide may not contain the information or tools required to change Perceived Behavioural Control.

Several findings surfaced that were neither in support of nor contrary to my first hypothesis, and these findings merit mention. First, one of the 11 specific behavioural beliefs was found to be different when the interaction between age and attitude was evaluated. This was the "reduce chronic disease" variable, and it was found to interact significantly with the guide, showing a main effect among the older adults. Oddly enough, however, mean values were higher among older adults who did not receive the guide, than among older adults who did. Again, perhaps exposure to information on what physical activity actually could do leads to a changed evaluation. Most British Columbians (73%) are aware of the health benefits of physical activity (CFLRI 's 2002 Physical Activity Monitor) – in fact many people may have unrealistic expectations of what exercise could do for them – the focus of the guide may not correspond with their expectations. When examining the older adult guide, it is evident that its focus is

directed far more on social and adaptive benefits of physical activity than on chronic disease. Consequently, this shift in information may be influencing these differences.

Second, when examining Attitude and Behavioural Beliefs, and where flexibility activities were considered, a significant interaction was found between the two conditions and the "control weight" variable, with higher mean values being seen in the experimental group than in the control group. This finding is currently difficult to explain, and replication of the study with the use of a larger sample is warranted in order to see whether similar effects surface when a larger number of individuals respond to the questionnaire.

While testing my hypothesis that participants in the experimental condition who read the guide would have significantly higher means of theory of planned behaviour constructs in comparison to the control group not receiving the guide, I also explored whether or not these findings would differ based on participants' ages. For the purpose of this study, participants aged 18-60 years were deemed "younger adults", and participants aged 60 years and older were deemed "older adults". This examination also tests for the effectiveness by guide, as older adults and adults were asked to read the guide tailored to their age.

When examining Attitude and Behavioural Beliefs, and when focusing on endurance activities, an evaluation of the age x guide interaction showed that two of the 11 specific behavioural beliefs were different. A significant interaction was revealed for "control weight", and when this interaction was further probed, a small but significant main effect was found present among younger adults. That is, among the younger adults, those who received the guide scored higher on the belief that endurance activities would be important for weight control than did those who did not receive the guide.

When focusing on strength activities, a significant interaction was revealed for "reduce chronic disease" (a medium-sized effect, .06), and when this interaction was further probed, a main effect was seen among older adults. Specifically, higher scores for the belief that engaging in strength activities would help reduce chronic disease were seen among the older adults who did not receive the guide, than among the older adults who did receive the guide. This finding is contrary to my original hypothesis, and cannot be easily explained. Perhaps when the older adults read the guide, they felt overwhelmed by all of Health Canada's prescribed physical activity, and felt that they would not be able to engage in the prescribed amount of activity, and in turn believed that they would not be able to reduce their chances of suffering from chronic disease. I would argue that among the older adults who did not receive the guide, but reported that they could reduce their chances of suffering from chronic disease, they reported that they could because they had already been informed that they could by referent others such as friends, family, and health professionals. This is not to say that those who received the guide were not also previously aware that they could reduce their chances of suffering from chronic disease by engaging in regular physical activity, but the people who read the guide also read about the amount and types of activity it takes to do so—what people who did not read the guide may not have also known.

When examining Subjective Norm and Normative Beliefs, and when focusing on strength activities, when I evaluated the age x guide interaction, I found only one of the six specific normative beliefs to differ. A significant interaction was revealed for the "health professionals" variable (a small-sized effect, .05), with higher mean values being seen among the older adults who did not receive the guide than among the older adults who did receive the guide. Being only of a small magnitude, however, this finding does not warrant any further discussion.

Where age was considered, several findings surfaced that were neither supportive of nor contrary to my first hypothesis, and these findings merit mention. First, an investigation of the age x guide interaction revealed main effects for "reduce injury" and "control weight". With "reduce injury", a main effect was seen among the older adults with higher mean values being seen among participants who did not receive the guide than among participants who did. This finding is of particular interest. I would expect that the "reduce injury" variable would be of greater importance among older adults more so than among younger adults, as older adults are physically more prone to injury due to degeneration of the muscular and skeletal system (ACSM, 1998) than are younger adults. I would also, however, however, expect that after reading Health Canada's guide, the experimental group would have become more knowledgeable about the importance of physical activity in the prevention and reduction of injury, and would in turn show higher mean values than the experimental group on the "reduce injury" variable. Perhaps the older adults who received and read the guide were somehow scared or threatened by the guide's contents, believing that by engaging in all of Health Canada's prescribed physical activity, that they would somehow injure themselves in the process.

In contrast to the "reduce injury" variable, with the "control weight" variable, a main effect was seen among the younger adults, with higher mean values being seen among the experimental group than among the control group. This finding is also of particular interest. It is somewhat odd that the "control weight" variable stood out to this degree where flexibility was involved. Neither in the adult guide nor in the older adult guide does the section on flexibility activities stress weight control as a benefit of engaging in flexibility activity. Perhaps society has become so heavily engrossed in body image and the desire to be thin that we have come to expect that any type of activity, whether endurance, strength, or flexibility, serve as a means to

achieve our desired weight. Flexibility activities are intended to assist us in keeping our joints healthy and in maintaining and improving our mobility and range of motion, whereas endurance activities are intended to assist us in fat burning processes, and in turn weight control. Perhaps Health Canada's guides need to provide a more clear definition or description of what the different activity types are intended for. Clearly participants are unknowingly or mistakenly expecting to reap desired benefits from the incorrect activity type, and therefore more clear definitions or descriptions of the three activity types are warranted.

Overall, my first hypothesis was not well supported. Even though the guide includes information to improve theory of planned behaviour constructs of attitude and subjective norm, and strategies to increase perceived control and self-efficacy, results of this study revealed inconsistent, and sometimes contrary effects to my hypothesis.

The second objective of this study was to see whether or not changes in intentions and physical activity behaviour would occur. Specifically, I wanted to see if there would be any evidence of an intention to treat, by providing one group, but not the other with Health Canada's physical activity guide.

My second, and tentative hypothesis for this study, was that participants in the experimental condition who read the guide would have significantly greater strength, endurance, and flexibility behaviour and intention frequencies in comparison to the control group not receiving the guide. In testing this hypothesis, I also explored whether or not physical activity levels and age would interact with the guide.

Through their guides, Health Canada was not successful at changing behaviour or intention, however, this is not surprising. Through the use of the guides, I was unsuccessful at

changing affective attitude and perceived behavioural control, and these variables, according to Ajzen (1991) are the two most important sets of beliefs in determining intention and action.

Having said this, self-efficacy and the sources from which it arises merits mention. Operating in a hierarchical manner, the most important sources of self efficacy are mastery experience (a person's experience in successfully carrying out a task), vicarious experience (behaviours of other people serve as a reference for our own understanding, capabilities, and enjoyment of a behaviour), and verbal/informational persuasion (Bandura, 1997). In terms of the intervention strategy used in this thesis (Health Canada's guide), if we want to change antecedents of behaviour, informational persuasion (i.e., the guide) is not as strong as personal experience and modeling (the other two factors of the SCT). According to Bandura (1997), verbal or informational persuasion is generally weak in its influence. However, although this form of persuasion on its own is limited in its power to create enduring increases in perceived efficacy, it can foster self change if the positive appraisal is within realistic bounds.

Actual behaviour and even intention change may take repeated exposure and considerable time (Cavill & Bauman, 2004). Making physical activity a more usual part of daily life is a long process, and physical activity campaigns should not be expected to lead directly to behavioural change. Rather, physical activity campaigns should aim to influence antecedent variables in a stepwise process (Cavill & Bauman, 2004). Cavill and Bauman (2004) would argue that rather than deeming behavioural change as an early outcome of a physical activity campaign, a more valid outcome would be a positive change in any of the antecedent variables, such as beliefs, social norms, or intention. Cavill and Bauman's argument, even though at odds with the traditional notion of social marketing (Maibach, Rothschild, & Novelli, 2002), which

focuses on behaviour as an outcome, lends support to my findings for both my first and my second objectives and hypotheses of this thesis.

Cavill and Bauman's (2004) argument corresponds with that of Prochaska (1991). Prochaska has suggested that one limitation of interventions aimed at changing physical activity behaviour may be that they rely too much on the behavioural processes of change, and, consequently, only appeal to people who are ready to take action in changing their current physical activity behaviour. Prochaska (1991) suggests a more promising approach to this limitation, which involves offering interventions that appeal to the vast majority of people who are not ready to take action in changing their current physical activity behaviour, or to offer stage-matched interventions

Four years following Prochaska's (1991) findings, when examining the importance of stage-matched physical activity interventions, Pinto (1995) found that sedentary people (pre-contemplators and contemplators) may benefit most from intervention programs aimed at making small increases in activity levels, and suggested that it is intention, and not behaviour that distinguishes pre-contemplators and contemplators from individuals at other stages. To my knowledge, there is not any more-recent evidence than that of Pinto's (1995) for different suggestions on how to improve physical activity interventions targeting large groups of people with varying activity levels.

I think that Prochaska's (1991) suggested approach can be seen in Health Canada's guide. It is evident when looking through the guide, that it does not overtly apply the Stages of Change model to its content, nor does it overtly appear to offer stage-matched physical activity messaging. The guide, does, however, subtly acknowledge peoples' different activity stages, by offering messaging and advice for currently inactive individuals, and individuals looking to

begin a physical activity regime (respectively, pre-contemplation, contemplation, and preparation) as well as for currently active individuals, and individuals looking to improve their current physical activity regime (respectively, action and maintenance).

Overall, the second objective of this study was not met, and based on my findings, my second hypothesis was not supported.

Post-Hoc Limitations

One major limitation to this study was that data were collected via self-report questionnaires, which can introduce social desirability bias as well as retrospective recall bias.

Research has shown that peoples' physical activity levels might be influenced by the changes in seasonal and climactic conditions (Uitenbroek, 1993). Considerable seasonal variation was found to affect both indoor and outdoor activities, with the month of July being the peak month for physical activity (Uitenbroek, 1993). Furthermore, older adults were found to engage in physical activity more so in the latter part of the year (October through December), and showed seasonal variation to a larger extent than younger adults (Uitenbroek, 1993). I sent out the first mail-out for this study in February, when according to Uitenbroek (1993), physical activity levels are not at their peak, especially among older adults. Based on Uitenbroek's (1993) findings, perhaps had I waited until late spring, or the onset of the summer months to send out my questionnaire (during which time physical activity levels are at their peak), my response rate might have been higher, and the guide might have actually mediated change in physical activity intentions and behaviours.

A further limitation to this thesis was my response rate. The time during which my questionnaires were sent out, an election was also in progress. Perhaps people were being bombarded with mail pertaining to the various campaigns, and my questionnaire was perceived

as an additional form of solicitation. I find it important to point out that many of the factors that influenced my response rate may not have necessarily affected the generalizability of my sample. Having compared the demographics of my sample to the demographics of Victoria's adult population, I found that with the exceptions of level of education, annual household income, and age, all socio-demographic variables appeared to be the same (Statistics Canada 2001 Census), even those pertaining to current physical activity levels (CFLRI, 2002).

Moreover, my questionnaire was rather lengthy (ten pages of questions), and perhaps it was presumptuous of me to believe that people would voluntarily spend the time filling out such a detailed questionnaire. The questionnaire could have been substantially shorter had I not targeted all three activity types (endurance, strength, and flexibility), however, I targeted all three types because Health Canada's guides address all three activity types collectively, and in conjunction with one another. Furthermore, the length of the questionnaire was influenced by the fact that I performed my assessment with the use of a full theoretical structure, specifically, the Theory of Planned Behaviour. Had I only evaluated the Theory of Planned Behaviour constructs at the global level, and not at the belief level, the questionnaire would have been substantially shortened. I did, however, test items at both the belief level and the global level so as to maintain as internally valid measures as possible.

Conclusion

The lack of intervention effect observed in this thesis is informative. It is evident that among previously inactive people, receiving Health Canada's guide may increase some informational/motivational constructs, but key motivational antecedents (affective attitude, and perceived behavioural control and outcomes (intention and behaviour) seem unaffected. For

previously active people, it appears as though the guide is not effective in increasing current physical activity behaviours.

Research has shown that maximum health benefits accrue when the least physically active people become moderately active (Pate, Pratt, Blair, et al., 1995). In this thesis, I observed a minor change in instrumental attitudes, behavioural beliefs, and subjective norms surrounding physical activity among previously physically inactive people. It appears as though Health Canada accomplished what they were hoping to by releasing their activity guides to the public, and making available the information about physical activity and fitness that would help people judge how much physical activity they needed to engage in so as to live a healthy life.

This study also made a meaningful contribution to Theory of Planned Behaviour literature. While most Theory of Planned Behaviour research has focused on the association between its constructs, and exercise behaviour and intention (Brenes, Strube, & Storandt, 1998; Conn, Tripp-Reimer, & Mass, 2003; Hagger, Chatzisarantis, & Biddle, 2002; Hausenblas, Carron, & Mack, 1997; Theodorakis, 1994; White, Troup, & Rempel, 2003), my study is in the minority in the sense that I looked at whether or not I could simply modify any of the constructs, not just behaviour as an end-product.

Replication of this study is warranted with the use of a larger sample size, Moreover, focus groups and further studies should take place throughout different months of the year so as to observe and capture time effects.

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APPENDICES

Appendix A: Literature Review

Benefits of Physical Activity and Exercise

The benefits of engaging in regular physical activity and exercise are well-documented (Surgeon General, 1996; American College of Sports Medicine (ACSM), 1998; Healthy People 2010, 2000; Health Canada, 2002, Canadian Fitness and Lifestyle Institute, 2002).

Population prediction estimates show that by the year 2021, the total percentage of adults aged 65 years and older will amount to 22% of the American population (Kim, 1994), and to 18.9% of the Canadian population (Statistics Canada, 2004). According to ACSM's 1998 Position Stand on exercise and physical activity in older adults, as more individuals continue to live longer, determining the extent and mechanisms by which physical activity and exercise can improve health, functional capacity and independence is imperative.

Participation in a regular physical activity or exercise program is an effective intervention in the prevention and reduction of various functional declines associated with age. Reduction in risk factors associated with disease states (e.g., diabetes, heart disease) improve health status and quality of life, and contribute to an increase in life expectancy (ACSM, 1998). ACSM (1998) has suggested that strength training can help offset loss of muscle mass and decrease in strength typically associated with aging, cardiovascular functioning can be improved or maintained through endurance training, and flexibility training can improve joint ranges of motion required for such daily living activities as level and inclined walking, stair climbing, and rising from a seated position. Additional benefits from regular physical activity and exercise include reduced risk for osteoporosis through improved bone health, reduced risk of falls and associated injuries, and a reduction in fractures through improved postural stability (ACSM, 1998).

According to Healthy People 2010 (2000), there is growing and convincing evidence showing that people of all ages who are generally inactive can improve their health and well-being by becoming active at a moderate intensity on a regular basis.

Rates of Physical Activity

Fifty percent of Canadian adults (individuals aged 18 years and older) do not engage in enough physical activity to procure the benefits (Canadian Fitness and Lifestyle Research Institute (CFLRI), 2002). Numerous researchers have found that as people age, positive exercise beliefs and levels of physical activity decrease, and that older women have the lowest rates of physical activity compared with any other community group (Booth, Owen, Bauman, Clavis, & Leslie, 2000; Lucas, Orshan, & Cook, 2000). Further, according to Dishman (1988) approximately 50% of people who begin a physical activity program withdraw within the first six months.

Costs Associated with Physical Inactivity

Physical inactivity is defined as not engaging in any regular pattern of physical activity beyond daily functioning (Healthy People 2010, 2000). In 2004, Katzmarzyk and Janssen found that "the economic burden of physical inactivity was $5.3 billion ($1.6 billion in direct costs and $3.7 billion in indirect costs)".

Physical inactivity plays an integral role in the development and subsequent cost of a host of chronic and debilitating diseases (Health Canada, 2002). Considerable and extensive clinical evidence exists that supports the role of physical activity as an effective preventative strategy against such chronic debilitating diseases and illnesses as heart disease, hypertension, stroke, type-2 diabetes, colon cancer, breast cancer, osteoporosis, obesity, depression, anxiety and stress (Health Canada, 2002).

In 1996, the US Surgeon General (2002) issued a "national call to action" to position physical inactivity at the same level as tobacco use and non-compliance with seatbelt laws as serious and costly public health problems. Health Canada has published a similar opinion that "inactivity is as harmful to your health as smoking" (Health Canada, 2002). In response to the current, low levels of physical activity in adults, Health Canada recently completed and widely distributed a *Physical Activity Guide to Healthy Active Living* (1998a) and a *Physical Activity Guide to Healthy Active Living for Older Adults* (1998b).

Health Canada's Physical Activity Guides

In partnership with the Public Health Agency of Canada, the Canadian Society for Exercise Physiology (CSEP) worked to develop Canada's Physical Activity Guide to Healthy Active Living (see Appendix B) and Canada's Physical Activity guide to Healthy Active Living in Older Adults (see Appendix C). As posted on Health Canada's website (Health Canada, 2003), "research indicated that Canadians were unaware that physical inactivity is a serious risk factor for premature death, chronic disease and disability, a magnitude of risk comparable to that of smoking. Canadians were confused by all the data and information available about physical activity and fitness, and wanted a valid and practical guide similar to Canada's Food Guide to Healthy Eating that would help them judge how much physical activity, in general, they needed to achieve better health".

CSEP, Health Canada, and the Active Living Coalition of Older Adults, a community-based group representing twenty-six organizations from across Canada with an interest in healthy aging, worked in partnership to develop Health Canada's *Physical Activity Guide to Healthy Active Living for Older Adults* (see Appendix C). According to Health Canada (2003), "the guide

is based on years of collaborative research among international experts who discovered the beneficial effects of daily activity and its ability to decelerate the aging process".

According to Health Canada (2003), "a Guide Steering Committee was established to lead the development of the guide and ensure that it would be simple, relevant, and readily available to Canadians. The content was tested to ensure that it meets the needs of Canadians. In addition, an *Expert Scientific Review Process* was carried out by a group of internationally recognized Canadian researchers to reach consensus on the technical content of the guide. Prototypes of the guide were evaluated through a national concept-testing phase, which included country-wide focus groups with citizens, health and fitness practitioners, and a survey of more than 150 public, voluntary, and professional stakeholder organizations" (Health Canada, 2003).

Through the creation of their guides, Health Canada has attempted to broaden the term "physical activity" to encompass more than just traditional exercise. Exercise consists of planned or structured physical activity involving repetitive bodily movement done to improve or maintain one or more of the components of physical fitness – cardio-respiratory fitness, muscular strength, muscular endurance, flexibility, and body composition (Healthy People 2010, 2000). Physical activity, according to Health Canada's standards (1998a; 1998b), involves 30 to 60 minutes of strength, endurance and flexibility activities -- not just exercise-- at a moderate intensity most days of the week.

The guide provides a "rainbow of physical activities" that can help adults and older adults feel more energized, improve their mobility, and gain strength. According to Health Canada (1999), Dr. Ira Jacobs, President of the Canadian Society of Exercise Physiology, has stated that. "If used as directed, this new guide, specifically designed for older adults, is as close as we come to having an anti-aging medication".

Health Canada's guides include information and strategies intended to increase motivation towards regular physical activity, such as benefits and recommended amounts of physical activity, and possible barriers and solutions to overcome them.

Health Canada's Guides: Benefits of Physical Activity

Benefits of physical activity included in the guides are meeting new people, feeling more relaxed, sleeping better, increased feelings of enjoyment, continued independent living, improved physical and mental health, weight maintenance, and, better quality of life. Health Canada emphasizes that it is never too late to start getting active, and stresses that even those individuals with chronic conditions and physical limitations can offset negative effects of their conditions and limitations with regular physical activity.

Health Canada's Guides: Recommended Amounts of Physical Activity

As stated in the guides, Health Canada encourages all individuals to engage in at least 30 to 60 minutes of physical activity at a moderate intensity most days of the week, making selections from three groups of activities, including strength, endurance, and flexibility. Important safety precautions for engaging in these activities are also included. Health Canada encourages beginners to start slow and easy, and then build on frequency, intensity and duration of activities.

Health Canada's Guides: Possible Barriers to Engaging in Physical Activity and Suggested Solutions

Possible barriers addressed in the guides include lack of time due to work and care-giving responsibilities, arthritis, stiffness of joints and bones, osteoporosis, heart problems, weather conditions, and balance problems. Suggested solutions offered to overcoming these barriers are, respectively, getting in some activity on the way to and from work (walking part of the way),

getting in some activity while at work (walking during coffee or lunch breaks) getting out and being active with kids, performing activities while seated or lying down, finding activities that are new and motivating, and finding activities that can be performed indoors. Also included in the guide are testimonials of other people who share information about their preferred physical activities, barriers they have faced and overcome, and resources they continue to use. The guide is accompanied by a handbook which includes a daily calendar on which people can schedule and record physical activities, steps informing people how to appropriately schedule and record activities, a list of available physical activity support-agencies in the community, as well as a list of contacts to get in touch with in order to inquire about physical activity opportunities and facilities in one's community.

Given the wide distribution and access of the guide across the Canadian adult and older adult populations (Spence, Plotnikoff, & Mummery, 2002) documenting its efficacy as a tool for motivation change is warranted.

Print-Media as a Method

According to Marcus, Owen, Forsyth, Cavill, and Fridinger (1998a), media-based interventions--interventions aimed at reaching individuals using a medium other than personal contact with a health service provider or health professional--offer the possibility of reaching larger numbers of individuals at a lower cost than that associated with services that involve face-to-face contact. Even if the appropriate variables are being addressed, however, the method in which they are disseminated is crucial in the structuring of an effective intervention.

There appears to be mixed evidence with regards to the effectiveness of print-based media interventions. Considering the wide distribution of Health Canada's physical activity

guides, it is important to also consider and evaluate the effectiveness of print-based media as a form of intervention for physical activity.

As shown in Table 9, six articles pertaining to print media and physical activity were found. These articles were retrieved through searches of electronic databases such as PsychInfo, EbscoHost, and Web of Science. One of the six articles shown in Table 9 is a review (Marcus et al., 1998a) of 28 articles evaluating the effectiveness of various forms of physical activity interventions (mass-media, print-media and information technology). Of the 28 studies reviewed by Marcus et al. (1998a), nine involved an examination of print-based media (Owen et al., 1987; Marcus et al., 1992, 1996, 1997, 1998b; King et al., 1991, 1995; Cardinal et al., 1995, 1996). Overall, Marcus et al. (1998a) found that messages that were more structured tended to be outperformed by media-based approaches that allowed for greater flexibility. Further, Marcus et al. (1998a) have suggested that due to health-care professionals' limited amounts of time, print-based media may serve as a useful alternative to extensive personal counselling in the delivering of information that would otherwise be repeated for each individual counselled, and that print-based media would allow for the supplying of additional information, as well as a means of follow-up in the maintenance phase.

The frequency of the delivery of print-based materials also appears to be of importance. Owen, et al. (1987) found that a single mailing of print-based materials resulted in greater change in physical activity adherence than multiple mailings of materials, and that this "one shot mailing strategy" served more useful because having all the material at hand all at once offered participants greater flexibility in designing their own physical activity program, thereby tailoring to their own needs. The current explanation for this is that if information is being given at different times, people become quickly confused and frustrated. If people get information

through one mail-out, and try to create a plan, and then through a second mail-out get new or additional information, they then have to re-work their original plan.

According to Donovan and Owen (1994), the tailoring of any media-based form of communication, whether in specific physical activity programs or broader campaigns, must be informed by data from samples that are representative of a population, allowing socio-demographic attributes of target populations to be identified. Consistent with Donovan and Owen's proposition, Marcus et al. (1997, 1998b) found that, compared with non-tailored print-based media, print-based media based on a tailored stages-of-change paradigm resulted in greater improvement of physical activity behaviours. In addition, Cardinal and Sachs (1995, 1996) found that print-based media geared toward lifestyle activities were better than print-based media geared toward the promotion and prescription of structured exercise.

A recent study (Marshall, Leslie, Bauman, Marcus, & Owen, 2003), not included in Marcus et al.'s 1998 review of 28 studies (1998a), compared the effectiveness of print-based media versus website physical activity programs, and found no differences between the web-based and print-based media program effects on reported physical activity. The print-media group showed slightly greater effects and a greater level of recognition of program materials. As argued by Marcus et al. (1998a), the majority of smaller scale media programs, such as print-based media (in comparison with larger scale mass media campaigns), reported increases in physical activity behaviours, however, only in the short term. In their 1998 review of 28 studies, Marcus et al. (1998a) found that some studies employed print-based media in place of personal counselling, but that since only one study directly compared the efficacy of print-based media interventions with face-to-face interventions, the benefits of print-based media cannot be fully determined.

In 2003, using the same theoretically-based print intervention as used by Marcus et al. in 1998 and by Owen et al. in 1987, Marcus et al. (in Press) conducted a 12-week randomized control trial to test the efficacy of an Internet intervention. Findings revealed that 55% of Internet users access the Internet for health or medical information, and for that reason, hypothesized that the Internet had the same considerable potential as print-based media as a delivery channel for delivering physical activity interventions. Marcus et al.'s (in press) hypothesis are in line with findings by Napolitano, Fotheringham, and Tate et al. (2003) from a preliminary investigation of an Internet-based physical activity intervention. Napolitano et al. (2003) have suggested that as Internet access increases, and as bandwidth and other technological aspects of this medium improve, Web site-delivered health behaviour interventions will become increasingly useful in public health promotion.

Table 9 Literature review of print-based media

Author and Year	Sample	Theory and Topic	Design	Findings
Cardinal, B.J., & Sachs, M.L 1995 1996	113 females aged 22-50 working in clerical positions.	TTM-Changes in lifestyle versus structured activity with the use of mail-delivered print materials over 1 month	Randomized control trial stratified by stage of readiness	Physical activity increased significantly for all groups. There was a greater increase in the lifestyle group than in the control group
Jones, N.D., DellaCorte, M.R., Nigg, C.R., Clark, P.G., Burbank, P.M., Padula, C., & Garber,C.E.2001	61 older adults aged 73 + 5.3 years from senior housing communities in Rhode Island	TTM-Test the efficacy of an inexpensive educational print exercise intervention based on the TTM for older adults	Retrospective one-shot survey	73% of participants found that the Seniorcise booklet created an interest and inspiration for them to actually engage in physical activity
Levy, S.S., & Cardinal, B.J.2004	185 volunteers aged 22-79 years	SDT-Efficacy of exercise print materials. Control group (American Heart Association physical activity facts packet), Intervention group (4-page packet promoting positive perceptions of	Randomized control trial over a 2-month period	Compliance was low, and there was no difference between groups

		exercise), and Intervention + Booster group (same 4-page packet as Intervention group, and a postcard emphasizing points from the 4-page packet).		
Marcus, B.H., Owen, N., Forswyth, L.H., Cavill, N.A., & Fridinger, F.1998	n/a	SCT, TTM	Review of 28 studies	Interventions using print-based media or telephone effectively changed behaviour in the short-term, while most effect studies were those in which contact and interventions were tailored to the target audience.
Marshall, A.L., Leslie, E.R., Bauman, A.E., Marcus, B.H., &, Owen, N.2003	655 staff members from an Australian university aged 43 + 10 years.	TTM-Evaluation of an 8-week stage-targeted print program (Print) versus an 8-week stage-targeted website program (Web).	Randomized experimental	Both groups increased their levels of physical activity at 10 weeks, but not by a significant amount either between or within groups. This finding was slightly higher in Print, and Print recalled materials slightly better than Web.
Napolitano, M.A., Fotheringham, M., Tate, D., Sciamanna, C., Leslie, E., Owen, N., Bauman, A., & Marcus, B.2003	65 adults employed at several hospitals in the northeast United States	TTM-Evaluation of an Internet intervention consisting of a Web site plus 12-weekly e-mail tip-sheets compared to a waiting- list control group.	12-week randomized control trial.	At both 1 and 3 months post-intervention, the experimental group was significantly more likely to have progressed in stage of motivational readiness for physical activity than those participants in the control group.

Mediating Variables and Physical Activity Interventions

There are limited "real-world" theory-based research or public health interventions. To evaluate the guides as physical activity intervention tools, this study has utilized constructs from a Theory of Planned Behaviour Perspective. Baranowski, Anderson, and Carmack (1998) have suggested the critical importance of including theoretically-mediating variables when evaluating an intervention. The advantage of this process is that it allows researchers to determine why (or why not) their interventions work.

The Theory of Planned Behaviour as a Mediator

Ajzen's (1991) Theory of Planned Behaviour is a model that has been used extensively to explain physical activity behaviour (Hagger, Chaantistzisar, & Biddle, 2002). The Theory of Planned Behaviour proposes that a person's intention to perform a behaviour is the key determinant to that behaviour being performed. Intention represents motivation to enact the given behaviour. Intention, in turn, is determined by three variables. The first of these variables is *Attitude*, which is reflected in affective (e.g., enjoyable versus un-enjoyable), and instrumental (beneficial versus harmful) evaluations of performing a behaviour. The second of these variables is *Subjective-Norm*, which reflects the perceived social pressure that an individual may feel to perform or not to perform a behaviour. The third and last of these variables is *Perceived Behavioural Control,* which represents the ease or difficulty of performing a behaviour when holding motivation as a positive constant (Rhodes & Courneya, 2003a, 2004). The summary proposition of the Theory of Planned Behaviour is that individuals will intend to perform a behaviour when they evaluate it positively, believe that important others think they should perform it, and perceive it to be under their control.

Another important variable to consider, however, is that of *Actual Behavioural Control*, which according to Ajzen, (2002) refers to "the extent to which a person has the skills, resources, and other prerequisites needed to perform a given behaviour. Successful performance of the behaviour depends not only on a favourable intention but also on a sufficient level of behavioural control. To the extent that Perceived Behavioural Control is accurate, it can serve as a proxy of actual control and can be used for the prediction of behaviour".

Theory of Planned Behaviour Beliefs and Associated Constructs

According to Ajzen (2002), interventions should be structured to operate at the level of our beliefs. By measuring specific beliefs (behavioural, normative and control) we can gain insight into individuals' behavioural constructs (their attitudes, their subjective norms, and their perceived behavioural control). *Behavioural Beliefs*, which represent the subjective probability that the behaviour will produce a given outcome, link the behaviour of interest to expected outcomes. The strength of each belief is weighed by the evaluation of the outcome or attribute of a behaviour, and the products are aggregated. Ajzen has argued that even though an individual may possess many behavioural beliefs surrounding a given behaviour, only a relatively small number are readily accessible at a given moment, and that these accessible beliefs -- in combination with the subjective values of the expected outcomes -- determine the prevailing attitude toward the behaviour.

Normative Beliefs refer to an individual's perceived behavioural expectations of such important referent individuals or groups as their family, friends, spouse and - - depending on the population and behaviour studied - - teacher, doctor, supervisor, and co-workers (Ajzen, 2002). Ajzen (2002) has proposed that an individual's normative beliefs -- in combination with their motivation to comply with the different referents -- determine the prevailing subjective norm.

Specifically, the motivation to comply with important referents contributes to the subjective norm in direct proportion to the person's subjective probability that the referent thinks the person should perform the behaviour in question (Ajzen, 2002). *Subjective Norm* is the perceived social pressure felt by an individual to engage or not to engage in a behaviour.

Control Beliefs refer to the perceived presence of factors that may facilitate or impede an individual's performance of a behaviour (Ajzen, 2002). Control Beliefs -- in combination with the perceived power of each control factor -- determine the prevailing perceived behavioural control (Ajzen, 2002). The perceived power of each control factor to impede or facilitate performance of the behaviour, in turn, contributes to perceived behavioural control; in direct proportion to an individual's subjective probability that the control factor is present (Ajzen, 2002).

Ajzen has proposed further that perceived behavioural control, if it is an accurate reflection of actual behavioural control, can together with intention be used to predict behaviour.

Theory of Planned Behaviour, Physical Activity and Exercise

Meta-analytic findings by Hausenblas, Carron and Mack (1997), Armitage and Conner (2001), and Hagger et al. (2002) show that intention largely affects our performance of exercise behaviours. Hagger et al. (2002) also found that while attitude and perceived behavioural controlo are important predictors of intention, subjective norm is often not significant, or yields only a small effect.

Results from Hausenblas et al.'1997 s meta-analysis of 31 studies merit further attention. First, results revealed that intention largely affects exercise behaviour (ES = 1.09). Second, results revealed that while subjective norm only moderately affected intention to exercise (ES = 0.56) and minimally affected exercise behaviour (ES = 0.18), attitude was found to largely affect

intention to exercise (ES = 1.22) and exercise behaviour (ES = 0.84). These findings are consistent with those of Armitage and Conner (2001). Results also revealed that perceived behavioural control largely affected both intention to exercise (ES = 0.97) and exercise behaviour itself (ES = 1.01). Based on their findings, Hausenblas et al. (1997) have suggested that the role of perceived behavioural control is important in the explanation and prediction of involvement in exercise for a couple of reasons. First, the strong association between perceived behavioural control and exercise behaviour is consistent with Ajzen's (1985) proposition that perceived behavioural control, independent of the mediating effect of intention, can influence behaviour. Second, the strong association between intention and perceived behavioural control suggests that the more the attainment of a behavioural goal is considered to be under volitional control, the stronger the association will be with an intention to perform a behaviour.

Like Hausenblas et al. (1997), Hagger et al. (2002) found that intention significantly predicted behaviour ($\beta = 0.51$) and attitude and perceived behavioural control were the best predictors of intention (respectively, $\beta = 0.40$, and, $\beta = 0.33$). Hagger et al. (2002) reported that overall, 44.50% of the variance in intention was explained by the Theory of Planned Behaviour model and its associated constructs of attitude, perceived behavioural control and subjective norm.

Two individual studies by Theodorakis (1994) and White, Troup, and Rempel (2003), also merit mentioning, as both found similar results to those found by Hausenblas et al. (1997) when looking at Theory of Planned Behaviour and physical activity among samples of younger adults

Theory of Planned Behaviour, Physical Activity, Exercise and Older Adults

Eleven papers on Theory of Planned Behaviour and exercise/physical activity are included in this review (see Table 10). Of the eleven, seven include older adult samples, with five involving older-adult samples only (inclusive of adults aged 65 years or older, ± five years) and two of the eleven involving an all-women sample. Of the seven papers involving older adults, two examined the effect of Theory of Planned Behaviour on exercise behaviour. One of the seven focused on the effect of Theory of Planned Behaviour on exercise intentions, and one examined the effect of Theory of Planned Behaviour on both exercise intention and behaviour. Two of the seven focused on the effect of Theory of Planned Behaviour on participants' stage of readiness for physical activity, and one focused on identifying beliefs that influence physical activity decisions. Overall, these seven studies reveal similar findings to those in meta-analyses of Hausenblas et al. (1997) and Hagger et al. (2002).

Attitude

Gravelle, Pare and Laurencelle (1997) found that 73.3% of the variance in exercise intention among active older adults was attributed to attitude, and that 69% of the variance in exercise intention was explained by the indicator of "good/beneficial". These findings, even though overwhelmingly supportive of a strong relationship between attitude and intention, should, however, be interpreted with caution. In their study, Gravelle et al. applied step-wise regression, and generally this is not a strong test as variables are only considered one at a time, and simultaneous effects of variables – in this case the simultaneous effect of variables of attitude --is not taken into account.

Conn, Tripp-Reimer, and Maas (2003) found that older women who reported more-favourable behavioural beliefs about exercising were also more likely to intend to exercise ($r = -0.60$) and carry out exercise behaviours ($r = -0.36$). Results by Gravelle et al. (1997) and Conn et

al. (2003) confirm Rhodes et al.'s (1999) suggestion that among elderly individuals, attitudes toward the value and importance of exercise are significantly associated with exercise intention and behaviour.

Subjective Norm

Unlike previous studies (Michels & Kugler, 1998; Brenes, Strube, & Storandt, 1998) involving the effects of subjective norm on physical activity/ exercise intention and behaviour in older adults, Conn et al.(2003) found that normative beliefs, like behavioural beliefs and control beliefs, significantly predicted exercise intention ($r = 0.47$). Conn et al. (2003), however, like others (Michels & Kugler, 1998; Brenes, Strube, & Storandt, 1998) did not find subjective norm to be a significant predictor of exercise behaviour ($r = 0.06$). Conn et al.'s (2003) finding that normative beliefs predicted intention to exercise, but not exercise behaviour, fails to support the normative component of Ajzen's (1985) Theory of Planned Behaviour. Perhaps the lack of strength of subjective norm in affecting exercise behaviours suggests that decisions to engage in exercise are voluntary, and are not influenced by referent others.

In a qualitative descriptive study involving older women's beliefs about physical activity, Conn (2001) found that older women talked about physical activity as being embedded in their social lives, and Conn (2001) has proposed that these findings of beliefs about physical activity suggest the usefulness of a social model in planning public health interventions aimed at increasing physical activity among populations of older women.

Perceived Behavioural Control

According to Ajzen (1985), unlike attitude and subjective norm, perceived behavioural control is thought to directly influence behaviour, and behavioural intention. There appears to be mixed evidence with respect to the effects of perceived behavioural control on exercise

behaviour. While Conn et al. (2003) have suggested that perceived behavioural control is a significant predictor of both exercise intention and behaviour, Michaels and Kugler (1998) found perceived behavioural control to be important in the explanation of exercise intent but not exercise behaviour.

Brenes, Strube, and Storandt (1998) found that "direct" measures of Theory of Planned Behaviour variables predicted 9% of exercise behaviour after one month of beginning to exercise, but not after three or nine months, and that only perceived behavioural control significantly predicted exercise behaviour at one month. Brenes et al. proposed that the drop in exercise behaviour after three and nine months suggests that older adults are influenced by variables not included in the Theory of Planned Behaviour. For example, even though an individual may intend to exercise, he or she may stop due to illness. Illness, however, should manifest itself in perceptions of control. Therefore, measurement and methodological concerns may be responsible for findings. Still, Brenes et al. point out that even though the Theory of Planned Behaviour was only moderately useful in predicting exercise behaviour, older adults in their study intended to exercise, and the majority was still exercising after nine months, which suggests that interventions should focus on getting older adults to make the initial decision or intention to exercise.

The importance of perceived behavioural control suggests that older adults may believe that exercise is not completely under volitional control, however, the inconsistency of findings among the six papers on the Theory of Planned Behaviour and older adults used in this review does not allow for clear interpretation of the importance of perceived behavioural control in predicting exercise intention and behaviour in older adults.

Theory of Planned Behaviour and Stage of Readiness for Physical Activity and Exercise

In 1995, Courneya found that intention, attitude and perceived behavioural control all showed direct relationships with stage readiness of physical activity. In 1998, Courneya, Nigg and Estabrooks found that Theory of Planned Behaviour constructs (intention, attitude, and perceived behavioural control) were significant predictors of exercise stage, that intention mediated the effects of Theory of Planned Behaviour constructs on exercise stage, and that exercise behaviour was best predicted by exercise intention rather than stage of readiness for exercise. Courneya (1995) and Courneya et al.'s (1998) results further highlight the importance of the Theory of Planned Behaviour construct intention in mediating exercise behaviour – regardless of one's stage of readiness for physical activity (from pre-contemplation through maintenance).

Table 10 Literature review of Theory of Planned Behaviour (TPB)and physical activity/exercise

Author and Year	Sample	Topic	Design	Findings
Brenes, G.A., Strube, M.J., & Storandt, M.1998	105 older adults aged 53-84 years from five YMCAs	TPB and exercise/physical activity in older adults	Longitudinal-correlation	"Direct" measures of TPB variables predicted 9% of exercise behaviour after 1 month of exercise, but not after 3 or 9 months. Only perceived behavioural control predicted exercise behaviour after 1 month. Maybe drop in exercise is due to variables not included in TPB.
Conn, V.S.2001	30 older women	Beliefs about physical activity	Qualitative Descriptive	3 themes were revealed through interviews: social influences on physical activity, psychosocial benefits of activity, joint problems and fatigue as factors that interfere with activity. Findings suggest the usefulness of a social model when planning public health interventions aiming to increase physical activity in populations of older women.
Conn, V.S., Tripp-Reimer, T., & Mass, M.L 2003	225 independent, community-dwelling older women, aged 65 or older	TPB and exercise/physical activity in older adults	Prospective-correlation	PBC significantly predicts both exercise intention and behaviour.

Courneya, K.S 1995	288 older adults aged 60 years and older from the Kerby Center (Alberta, Canada)	TPB and stage of readiness for exercise/physical activity	Cross-sectional correlation	More than 50 % of the sample had been engaging in regular physical activity for longer than 6 months, and that readiness for physical activity had direct relationships with intention, attitude and perceived behavioural control.
Courneya, K.S., Nigg, C.R., &Estabrooks, P.A.1998	131 older adults	TPB and stage of readiness for exercise/physical activity	3-year longitudinal	TPB constructs were significant predictors of exercise stage, intention mediated the effects of TPB constructs on exercise stage, and exercise behaviour was best predicted by intention rather than stage
Gravelle, F., Pare, C., & Laurencelle, L. 1997.	118 older adults aged 55-70 years from metropolitan Ottawa	TPB and exercise/physical activity in older adults	Experimental	Attitude explained 73.3% of the variance in intention, and the variable "good/beneficial" explained 69.9% of the variance in intention.
Hagger, M.S., Chatzisarantis, N.L.D., & Biddle, S.J.H. 2002	n/a	TPB and exercise/physical activity	Meta-analysis of 31 studies	Intention has a large effect on behaviour. Intention is influenced largely by attitude and perceived behavioural control, but only minimally by social norm.
Hausenblas, H., Carron, A.V., & Mack, D.E. 1997	n/a	TPB and exercise/physical activity	Meta-analysis of 72 studies	Intention has a large effect on behaviour. Intention is influenced largely by attitude and perceived behavioural control, but only minimally by social norm.

Michels, T.C., & Kugler, J.P. 1998	5,000 older adults aged 65 to 70 years in DeWitt Army Community Hospital catchment area	TPB and exercise/physical activity in older adults	4-week prospective survey	Attitude, perceived behavioural control and social norm all contribute to exercise intent. Intent remains a significant predictor of exercise behaviour, but perceived behavioural control does not.
Theodorakis, Y 1994	395 females aged 18-45 in physical fitness programs over a 2-month period	TPB	Correlation	Attitude toward behaviour, and perceived behavioural control predicted intention to exercise. Exercise behaviour was predicted by intention, perceived behavioural control, and attitude. Perceived behavioural control was a more accurate predictor of behaviour than of intention
White, K., Troup, C., & Rempel, L. 2003	192 adults	TPB and exercise/physical activity	Randomized Control Intervention	Unlike attitude and PBC, SN is not important in the performance of activity behaviours

Summary

In response to the current low levels of physical activity in older adults, Health Canada recently completed and widely distributed physical activity guides for adults and older adults (print-based media interventions). Given the wide distribution of the guides and the fact that their effectiveness as motivational tools have not yet been evaluated, and, seeing as Ajzen's (1991) Theory of Planned Behaviour has been used extensively to explain physical activity behaviour (Hagger et al., 2002), it is important to evaluate the guides according to this theoretical framework.

Objectives

Objective 1:

The first objective of this study was to determine if individuals exposed to the guide differed from individuals who were not exposed to the guide in terms of their beliefs towards physical activity.

Objective 2:

The second objective of this study was to determine if individuals exposed to the guide differed from individuals who were not exposed to the guide in terms of changing their physical activity intentions and behaviours.

Objective 3:

The third objective of this study was to determine if changes in intention and behaviour were mediated by Theory of Planned Behaviour variables.

Purpose

The purpose of the following study was to evaluate the efficacy of the guides as motivational instruments for physical activity promotion in adults and in older adults. This study

was the first to evaluate the efficacy of Health Canada's physical activity guides as an intervention of behavioural outcomes, and the first to evaluate the efficacy of the guides as motivational instruments for physical activity using any validated model of motivation.

Hypotheses

Hypothesis 1

I hypothesized that participants in the experimental condition who read the guide would have significantly higher means of Theory of Planned Behaviour constructs in comparison to the control group not receiving the guide. When testing this hypothesis, I also explored whether or not previous physical activity levels and age would interact with the guides.

Hypothesis 2

I hypothesized that participants in the experimental condition who read the guides would have significantly greater strength, endurance, and flexibility behaviour, and greater intention frequencies in comparison to the control group not receiving the guides. In testing this hypothesis, I also explored whether or not previous physical activity levels and age would interact with the guide.

Hypothesis 3

I hypothesized that constructs of Theory of Planned Behaviour would mediate the relationship between the guides and one-month behavioural outcomes.

Assumptions

1. Participants in the experimental condition will read Health Canada's physical activity guides prior to filling out the questionnaire.

2. Participants in the experimental condition will read the guide that corresponds to their current age (adult guide if aged 18-64 years, and older adult guide if aged 65 years and older).
3. Social desirability – Participants in the current study will provide honest answers when answering questions with regards to physical activity behaviours.

A Priori Limitations

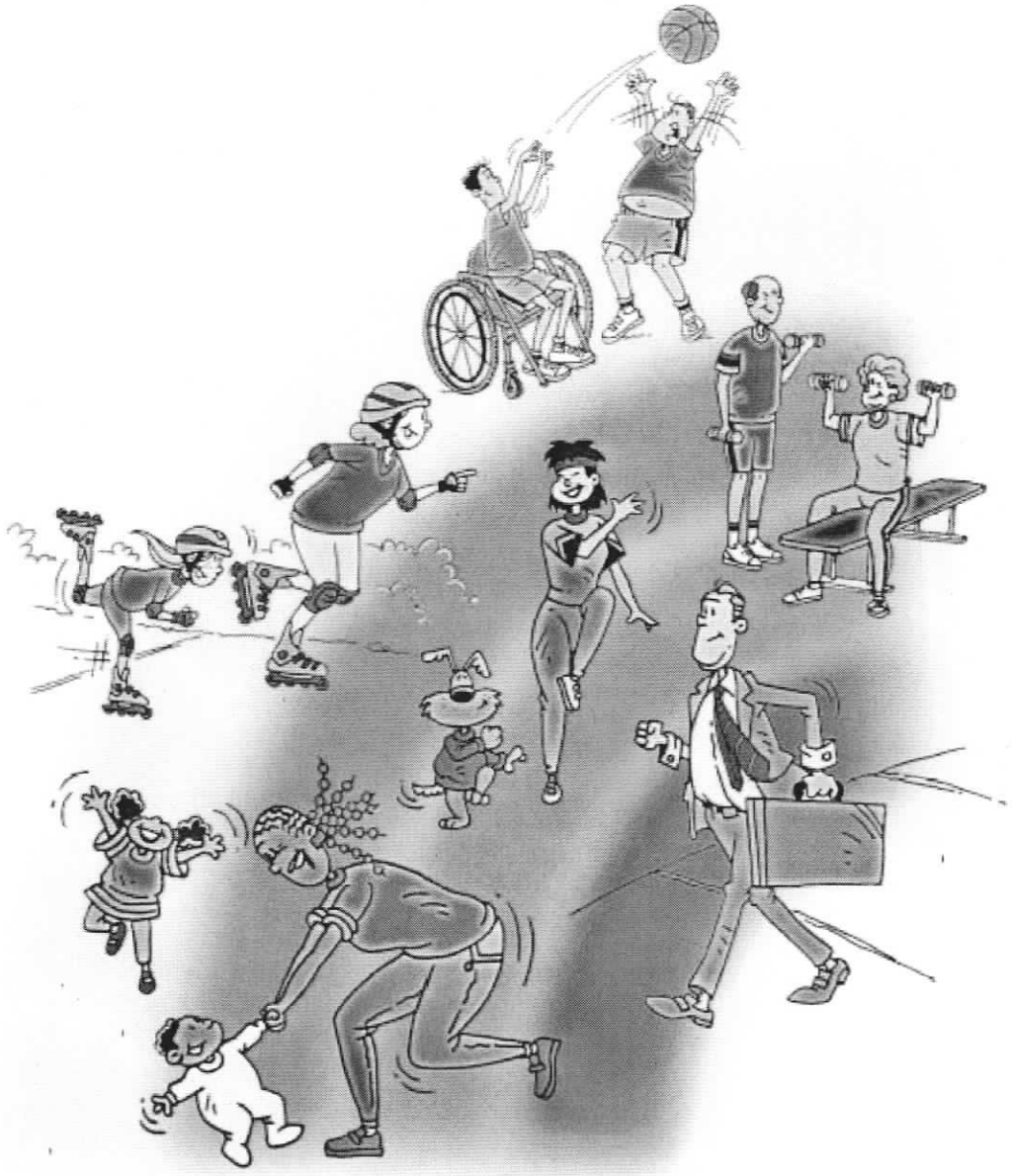
1. Only those individuals listed in the Greater Victoria area phonebook will have the chance to be selected for the current study.
2. Not all individuals complete and return the questionnaire package.
3. Generalizability – This is a West Coast study. Environmental restrictions are not the same in Victoria as they are in other parts of the country.
4. Self-reported measures of physical activity behaviours may not be completely accurate. Participants might not provide honest answers when filling out the questionnaire.
5. Time of year. Results might be different if the study was conducted later on in the year as opposed to earlier on in the year.
6. Single-item belief measures – lack of reliability when questions are only posed once, in one form. This, however, is being done out of concerns for time (both for completion of the study and for the participant filling out the questionnaire).

Delimitations

1. Questionnaires are only being sent to residences in the Greater Victoria Area.
2. Follow-up conducted at the one-month period (as opposed to earlier or later) so that change can be measured, and so that I can avoid participants getting bored or forgetting about the study.

Appendix B: Health Canada's Physical Activity Guide to Healthy Active Living

Handbook for CANADA'S Physical Activity Guide to Healthy Active Living



Includes pull-out copy of the Guide

Health Canada Santé Canada

CSEP SCPE Canadian Society for Exercise Physiology

Physical activity improves health.

Every little bit counts,

but more is even better -

everyone can do it!

What is *Canada's Physical Activity Guide to Healthy Active Living*?

It is a *Guide* to help you make wise choices about physical activity. Choices that will improve your health, help prevent disease, and allow you to get the most out of life.

The *Guide* is the pull-out section in the two centre pages of this *Handbook*. It provides a rainbow of physical activities that can help you have more energy, move more easily, and get stronger. It tells you how much activity you should strive for and how to get started. It also lists the many benefits of physical activity and the health risks of inactivity. This *Handbook* provides additional information to help you make the best use of the *Guide*.

Using this *Handbook*

Improving your health through physical activity is easier than you think. You will gain significant health benefits just by adding physical activity to your daily routine. Your benefits will increase as you add more activities to your day. The best news of all is that physical activity doesn't have to be very hard to improve your health!

This *Handbook* has been designed to help you get started. It tells you why physical activity is important for your health, and the problems you could experience if you are inactive. It gives you lots of examples to help you choose physical activity that's right for you. It will help you to build physical activity into your routines at home, at school, at work, at play and on the way. It shows you how you can start slowly and build up so that active living becomes as natural as brushing your teeth or putting on your seat belt.

No matter what you are doing now, there are tips to help you become more active, enjoy better health and get the most out of life. There are examples of people just like you, who are working to get moving and improve their health through regular physical activity.

Just by reading this *Handbook*, you are taking the first step to a more active and healthier lifestyle.

Contents

Physical Activity Guide centerfold pull-out

Get active your way –

build physical activity

into your daily life...

- at home
- at school
- at work
- at play
- on the way

...that's

active living!

Why Physical Activity is Important for You

People need to be active to be healthy. Our modern lifestyle and all the conveniences we've become used to have made us sedentary – and that's dangerous for our health. Sitting around in front of the TV or the computer, riding in the car for even a short trip to the store and using elevators instead of stairs or ramps all contribute to our inactivity. Physical inactivity is as dangerous to our health as smoking!

Add up your activities during the day in periods of at least 10 minutes each. Start slowly...and build up! If you're already doing some light activities, move up to more moderate ones. A little is good, but more is better, if you want to achieve health benefits.

Benefits of regular activity:

- better health
- improved fitness
- better posture and balance
- better self-esteem
- weight control
- stronger muscles and bones
- feeling more energetic
- relaxation and reduced stress
- continued independent living in later life

Health risks of inactivity:

- premature death
- heart disease
- obesity
- high blood pressure
- adult-onset diabetes
- osteoporosis
- stroke
- depression
- colon cancer

Consider adding activity - more time, more effort, more often. If you are already regularly active, you can still benefit by adding activity. Generally, the more active you are, the more benefits you will get.

What's the goal?

Scientists say accumulate 60 minutes of physical activity every day to stay healthy or improve your health. Time needed depends on effort – as you progress to moderate activities, you can cut down to 30 minutes, 4 days a week.

Physical activity doesn't have to be very hard to improve your health. This goal can be reached by building physical activities into your daily routine. Just add it up in periods of at least 10 minutes each throughout the day. After three months of regular physical activity, you will notice a difference – people often say getting started is the hardest part. This *Handbook* will show you how easy it can be!

Time needed depends on effort

Very Light Effort	Light Effort *60 minutes*	Moderate Effort *30-60 minutes*	Vigorous Effort *20-30 minutes*	Maximum Effort
• Strolling • Dusting	• Light walking • Volleyball • Easy gardening • Stretching	• Brisk walking • Biking • Raking leaves • Swimming • Dancing • Water aerobics	• Aerobics • Jogging • Hockey • Basketball • Fast swimming • Fast dancing	• Sprinting • Racing
	How does it feel? *How warm am I? What is my breathing like?*			
• No change from rest state • Normal breathing	• Starting to feel warm • Slight increase in breathing rate	• Warmer • Greater increase in breathing rate	• Quite warm • More out of breath	• Very hot/ perspiring heavily • Completely out of breath
	Range needed to stay healthy			

What do the experts say I have to do?

There are three types of activities you need to do to keep your body healthy: endurance activities, flexibility activities, and strength activities. Do a variety from each group to get the most health benefits. The *Guide* offers you a rainbow of activities to choose from, so tear out the *Guide* from the centre of this *Handbook* now so you can follow along as you read further.

Take a look and see what activities appeal to you. Choosing things you like to do is one of the best ways to build regular physical activity into your life. Check out more examples later in this *Handbook*.

The Three Activity Groups

1. Endurance Activities: (4-7 days a week)

Endurance activities help your heart, lungs and circulatory system stay healthy and give you more energy. They range from walking and household chores to organized exercise programs and recreational sports.

Here are some examples to get you thinking about how to increase your endurance activities:

- walking
- golfing (without a ride-on cart)
- yard and garden work
- propelling a wheelchair ("wheeling")
- cycling
- skating
- continuous swimming
- tennis
- dancing

Playing It Safe

For endurance activities, begin with light activities and progress to moderate and vigorous activities later, if you like. (This will prevent or minimize any muscle soreness you might experience when you are starting out.)

- Use comfortable footwear that provides good cushioning and support.
- Wear comfortable clothing that suits your activity – and the weather!
- Wear safety gear approved by the Canadian Standards Association (CSA) whenever appropriate (e.g., a helmet for cycling and in-line skating, along with knee, elbow and wrist protectors; protective eye goggles for squash).

Safe Stretching

Start with five minutes of light activity (easy walking, etc.) beforehand, or do your stretching after your endurance or strength activity.

- Stretch slowly and smoothly without bouncing or jerking. Use gentle, continuous movement or stretch-and-hold (for 10-30 seconds) whichever is right for the exercise.
- Aim for a stretched, relaxed feeling – avoid pain, don't hold your breath, and breathe in a natural rhythm.
- Seek help from a fitness professional or get a good book on stretching if you're not sure what to do.

2. Flexibility Activities: (4-7 days a week)

Flexibility activities help you to move easily, keeping your muscles relaxed and your joints mobile. Regular flexibility activities can help you to live better, longer, so that your quality of life and independence are maintained as you get older. Flexibility activities include gentle reaching, bending, and stretching of all your muscle groups.

Here are some ideas to help you increase your flexibility activities:

- gardening
- mopping the floor
- yard work
- vacuuming
- stretching exercises
- T'ai Chi
- golf
- bowling
- yoga
- curling
- dance

3. Strength Activities: (2-4 days a week)

Strength activities help your muscles and bones stay strong, improve your posture and help to prevent diseases like osteoporosis. Strength activities are those that make you work your muscles against some kind of resistance, like when you push or pull hard to open a heavy door.

To ensure good overall strength, try to do a combination of activities that exercise the muscles in your arms, mid-section, and legs. Strive for a good balance – upper body and lower body, right and left sides, and opposing muscle groups (e.g., both the front and back of the upper arm).

Here are some ideas to increase your strength activities:

- heavy yard work, such as cutting and piling wood
- raking and carrying leaves
- lifting and carrying groceries (not to mention infants and toddlers!)
- climbing stairs
- exercises like abdominal curls and push-ups
- wearing a backpack carrying school books
- weight/strength-training routines

Safe Strength Training

Start with five minutes of light endurance activity and stretching at the beginning of each session.

- Learn proper technique to protect your back and joints from undue stress.
- Use light weights and high repetitions (2-4 sets of 10-15 repetitions of each exercise).
- Breathe regularly when doing an exercise – don't hold your breath!
- Rest for at least one day between strength-training sessions.
- Get help from an experienced leader or consult a reputable book for more information.

20 minutes +

How Do I Know if I'm Doing Enough Physical Activity to Stay Healthy?

If you are not sure, you're probably doing activities in the light to moderate range on the chart below. You need to work towards adding up 60 minutes of activities a day in periods of at least 10 minutes each. It's really pretty easy. Remember, every little bit counts!

Let's take a look at a typical day in the life of some average Canadians – just like you – who have chosen to build physical activity into their daily routines. You'll see it's easy – and you can find the time even if you are busy.

10 minutes +

Time needed depends on effort

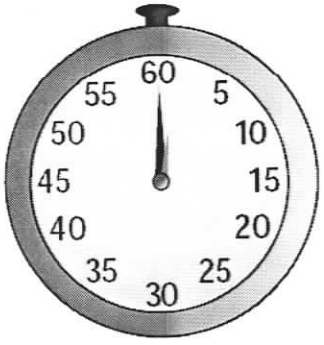
Very Light Effort	Light Effort *60 minutes*	Moderate Effort *30-60 minutes*	Vigorous Effort *20-30 minutes*	Maximum Effort
• Strolling • Dusting	• Light walking • Volleyball • Easy gardening • Stretching	• Brisk walking • Biking • Raking leaves • Swimming • Dancing • Water aerobics	• Aerobics • Jogging • Hockey • Basketball • Fast swimming • Fast dancing	• Sprinting • Racing

Range needed to stay healthy

20 minutes +

10 minutes

=



60 minutes

A year ago, none of the following people were doing enough physical activity to stay healthy. Later in this *Handbook* you'll see how they got started. This may give you some ideas about how you could start to build physical activity into your daily routine.

Here's What People Like You Are Doing Now

Meet Pierre (age 55)

He gets up at seven, eats a healthy breakfast and walks to the bus (10 minutes).

At noon, he meets his friend Sue and most days they walk before lunch ... (10 minutes). Before heading back to the office – another 10 minute walk – they do a few stretches to help them stay relaxed through the afternoon.

After work he walks back home from the bus (10 minutes). His walk home is at a brisk pace so that he feels a noticeable increase in his breathing. He enjoys the feeling that this increase in effort gives him.

After dinner he usually does some type of physical activity like walking, skating or swimming at the community recreation centre with his wife, which gets her moving as well (20 minutes). There's 60 minutes and he hardly even noticed!

Introducing Rashida (age 30)

She stays home with her daughter who's four and her son who's two. Running after them keeps her busy, but she also builds activity time into her day. She got started by changing the TV channel to exercise programs and participating in those exercises she felt comfortable doing.

Most mornings now, she follows half an exercise program on TV (10 minutes), and then she puts on music and dances with her children for at least another 10 minutes. Sometimes she does the exercises or dancing with the children's shows on TV.

After lunch she walks to the park with the children, and pushes them on the swings (20 minutes).

After dinner she and her husband romp with the kids before story-time and bed (20 minutes). It was easy for her to get her 60 minutes in while entertaining the kids too!

Here's Jacqueline (age 40)

She's a single mum and does shift work on a full-time basis, which makes for an irregular and hectic schedule. She had to plan to get physical activity into her life and she had very little money. Here's what she does:

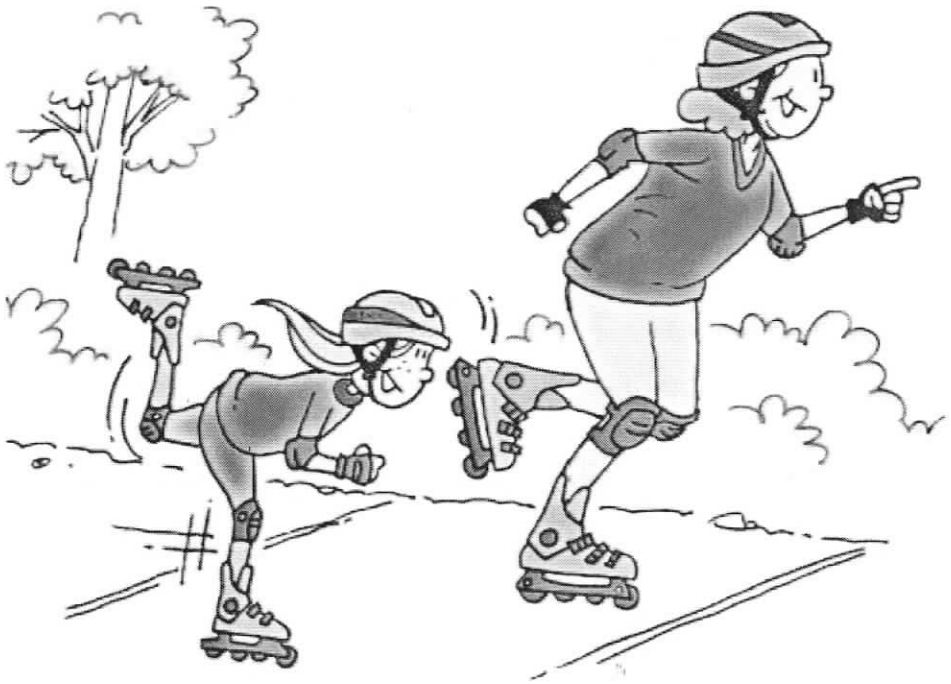
Physical activity doesn't have to be hard to improve your health.

She gets off the bus two stops before her workplace and walks the rest of the way (20 minutes). At work she takes the stairs instead of the elevator most of the time.

She also does easy stretching exercises like rolling her shoulders and stretching her neck during her coffee breaks. She also works her stomach muscles on the bus by tightening them, and working her back muscles by pushing the small of her back into the seat back, doing each for 30 seconds at a time. After only a short time, she felt it working and is now beginning to see an improvement in her posture.

Depending on her shift, she usually walks to the park or in-line skates with her children for 20 minutes or so, at some point in the day. When she misses a day during the week, she spends a little extra time being physically active on the weekends.

Housework like vacuuming or washing the floor makes up the rest of her 60 minutes. Sometimes she only gets in 30 minutes, but she knows that's OK too.



Physical activity can help you live better, longer, so that your quality of life and independence are maintained as you get older.

Say hello to Joshua and his friend Maria (ages 55+)

They are both retired. Joshua had a heart attack and Maria has arthritis, but they needed to put physical activity back in their lives. Their doctors suggested walking would be good for both of them, so they thought about giving it a try together. Here's what they do now.

In the morning they usually walk in the park for 20 minutes. In the winter, they go to the mall and walk there, making sure to walk up the stairs to the second level whenever possible. They use elevators a lot less now than they used to.

In the afternoon, they go to their local Y and join in physical activity periods with other seniors for about 30 minutes. Maria really likes the line dancing even though her arthritis prevents her from doing all the steps. Joshua likes to lift light weights and encourages Maria to do it with him for a bit -- sometimes she does it for 10 minutes. Sometimes they do T'ai Chi together.

Household chores help make up the rest of their 60 minutes of physical activity each day.

Meet Michel (age 25)

Michel is into computers in a big way. It seems that if he's not working on his computer, he is playing computer games, but now he makes sure to build physical activity into his day. And he doesn't let the fact that he is using a wheelchair get in his way.

He's lucky – his company has a fitness facility, so he goes there once a day to lift weights or 'wheel' on the indoor running track. This usually takes about 30 minutes of his work day. A few days a week he plays pick up basketball after work with his friends.

He is achieving the physical activity goals he set for himself and now knows that being in a wheelchair and being a "computer geek" doesn't have to mean being physically inactive. What's more, he still has plenty of time for his computer and he has rediscovered some of life's other enjoyments!

CANADA'S

Physical Activity Guide

to Healthy Active Living

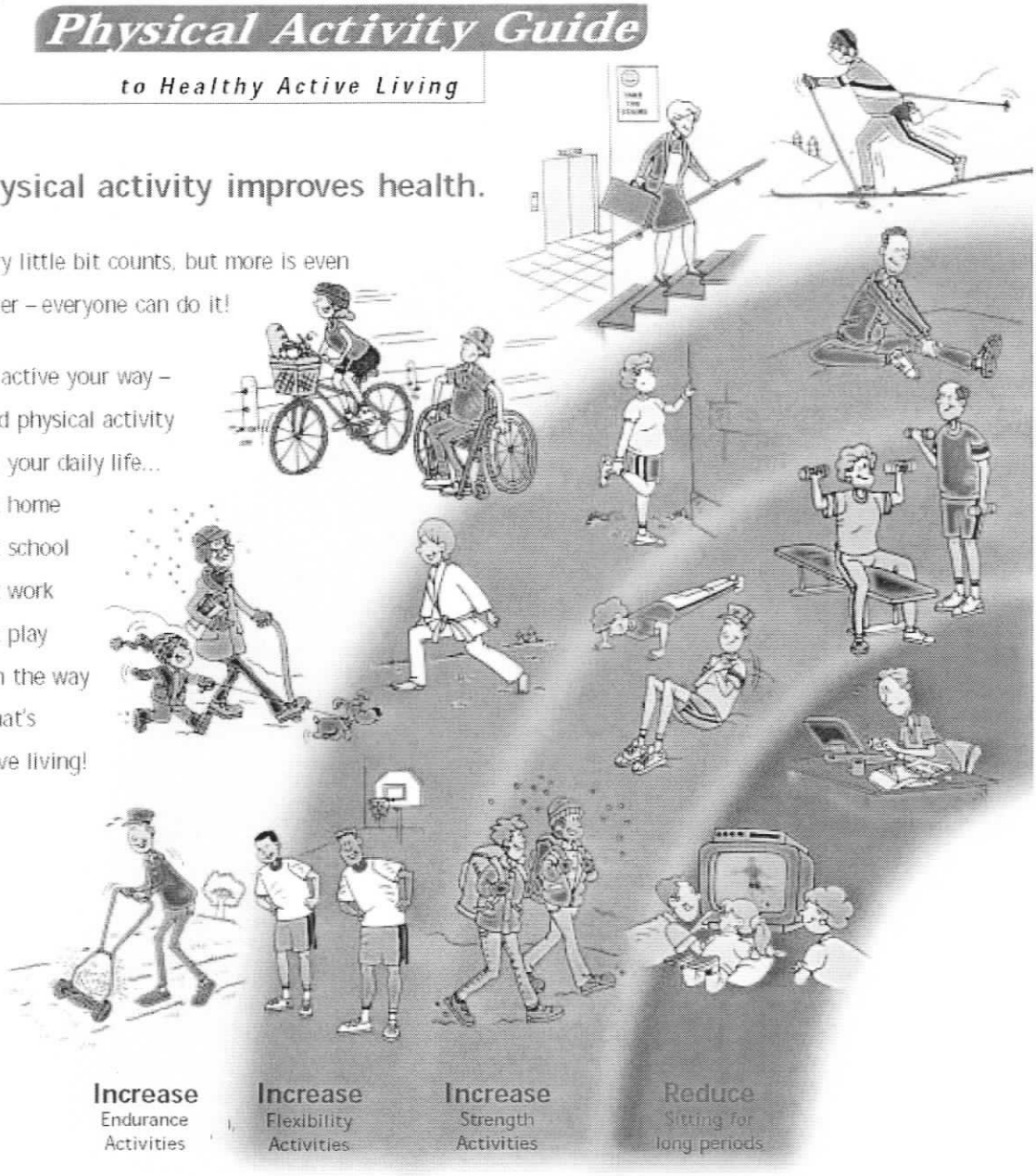
Physical activity improves health.

Every little bit counts, but more is even better – everyone can do it!

Get active your way – build physical activity into your daily life...

- at home
- at school
- at work
- at play
- on the way

...that's active living!



Increase Endurance Activities

Increase Flexibility Activities

Increase Strength Activities

Reduce Sitting for long periods

Health Canada Santé Canada

CSEP SCPE Canadian Society for Exercise Physiology

Choose a variety of activities from these three groups:

Endurance

4-7 days a week
Continuous activities for your heart, lungs and circulatory system.

Flexibility

4-7 days a week
Gentle reaching, bending and stretching activities to keep your muscles relaxed and joints mobile.

Strength

2-4 days a week
Activities against resistance to strengthen muscles and bones and improve posture.

Starting slowly is very safe for most people. Not sure? Consult your health professional.

For a copy of the *Guide Handbook* and more information: **1-888-334-9769**, or **www.paguide.com**

Eating well is also important. Follow *Canada's Food Guide to Healthy Eating* to make wise food choices.

Get Active Your Way, Every Day–For Life!

Scientists say accumulate 60 minutes of physical activity every day to stay healthy or improve your health. As you progress to moderate activities you can cut down to 30 minutes, 4 days a week. Add-up your activities in periods of at least 10 minutes each. Start slowly... and build up.

Time needed depends on effort

Very Light Effort	Light Effort *60 minutes*	Moderate Effort *30-60 minutes*	Vigorous Effort *20-30 minutes*	Maximum Effort
• Strolling • Dusting	• Light walking • Volleyball • Easy gardening • Stretching	• Brisk walking • Biking • Raking leaves • Swimming • Dancing • Water aerobics	• Aerobics • Jogging • Hockey • Basketball • Fast swimming • Fast dancing	• Sprinting • Racing

Range needed to stay healthy

You Can Do It – Getting started is easier than you think

Physical activity doesn't have to be very hard. Build physical activities into your daily routine.

- Walk whenever you can – get off the bus early, use the stairs instead of the elevator.
- Reduce inactivity for long periods, like watching TV.
- Get up from the couch and stretch and bend for a few minutes every hour.
- Play actively with your kids.
- Choose to walk, wheel or cycle for short trips.
- Start with a 10 minute walk – gradually increase the time.
- Find out about walking and cycling paths nearby and use them.
- Observe a physical activity class to see if you want to try it.
- Try one class to start – you don't have to make a long-term commitment.
- Do the activities you are doing now, more often.

Benefits of regular activity:

- better health
- improved fitness
- better posture and balance
- better self-esteem
- weight control
- stronger muscles and bones
- feeling more energetic
- relaxation and reduced stress
- continued independent living in later life

Health risks of inactivity:

- premature death
- heart disease
- obesity
- high blood pressure
- adult-onset diabetes
- osteoporosis
- stroke
- depression
- colon cancer

ACTIVE LIVING

Cat. No. H39-429/1998-1E ISBN 0-662-86627-7

Physical Activity Guide to Healthy Active Living

CANADA'S Physical Activity Guide to Healthy Active Living

Get Active Your Way,

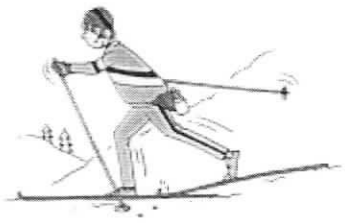
You Can Do It – Getting started is

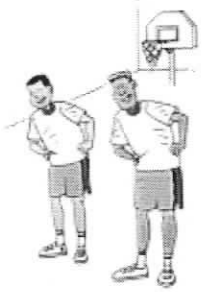
Sunday	Monday	Tuesday	Wednesda

ery Day–For Life!

asier than you think. Keep track of your activities. Record your progress.

y	Thursday	Friday	Saturday





This is Madeleine (age 17)

She's been inactive all her life until now. Here's how she turned things around and became active:

She always liked dancing so she started going three times a week to a dance aerobics class her Phys. Ed. teacher started at school (30 minutes). In fact, now she goes dancing with her friends on the weekends, which she never did before. As well, she started to feel better and even her grades went up.

Once a week she goes to yoga at the community centre for an hour and each day she does yoga exercises for about 20 minutes while watching TV – still her favourite pastime!

She never takes the family car anymore when she runs to the drug store or the market – she walks, and most days she walks to school too, about 10 minutes each way. Madeleine is well on her way to active living – and you can do it too!

Get Active Your Way Every Day – For Life! It's Easier Than You Think!

You can do it – here's why

Did you know that 63% of Canadians – just like you – are not active enough to achieve the health benefits they need from physical activity?

Your body is designed to move and it's surprising how little time it takes to stay healthy and reduce the risk of disease if you are physically active, regularly.

Consider this: you're awake about 15-19 hours a day, but you only have to be active for ONE HOUR and that 60 minutes of activity doesn't have to be done all at once. You can add up your activities, 10 minutes at a time, to get that daily total.

It's easy to take a first step and that counts as progress when you're getting started!

Add up your activities during the day in periods of at least 10 minutes each. Start slowly...and build up! If you are already doing some light activities, move up to more moderate ones. A little is good, but more is even better, if you want to achieve health benefits.

Here's How The People You Met Earlier Took Their First Steps

Check out how Pierre, Rashida, Jacqueline, Joshua, Maria, Michel and Madeleine did it and then think about your own plan, starting with that important first step. Remember, the first step is easier than you think and it really is progress. Jot down some ideas of your own in the space provided or tick off the things in their plans that might apply to you.

Jot down some ideas on how you can take your first steps:

_____

_____

_____

_____

_____

_____

How did Pierre get started?

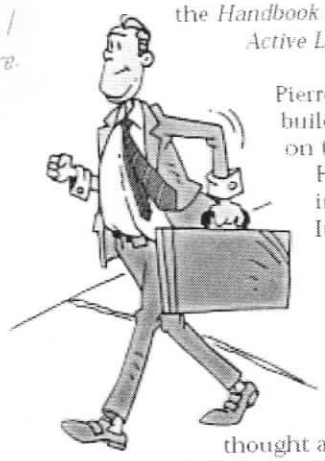
Pierre was 55 years old when he decided to put physical activity back in his life.

Just like all of us, he was very busy, had too little time for himself, had no energy and little motivation. He had been into sports when he was young, but his life had become too complicated for organized activities...and anyway there was no time. He didn't have enough money to invest in a health club either. He knew that he needed to exercise – his doctor had told him so on many occasions – but he just didn't get around to doing it.

One day, he was talking to a friend who told him that a mutual acquaintance had just died of a heart attack at 56. That's me, thought Pierre, I'll be next. That day, he decided he had better do something. But what? Here's what he did.

He went to his doctor for a check-up and asked him if he could help him get started. *This was Pierre's first step.* The doctor asked him what he wanted to do. Pierre laughed and said, "Nothing Doc, but I think I'd better do something!" The doctor gave him a brochure from the Heart and Stroke Foundation and the *Handbook for Canada's Physical Activity Guide to Healthy Active Living* to get him on the right track.

Today is the first day of the rest of my life. I'm going to walk to the bus every day – that's 10 minutes. Next week I might decide to do more.



Pierre went home and discovered that he could build activity into his daily life at work, at home, on the way, and he didn't have to join something. He put a simple plan together that he could fit into his day and posted it on the fridge. It simply read:

Today is the first day of the rest of my life. I'm going to walk to the bus every day – that's 10 minutes. Next week I might decide to do more.

Every step that Pierre took was progress. He thought about it, asked for advice, read information and reminded himself to try. After one month he walked 10 minutes most days of the week.

Now Pierre does 60 minutes of physical activity most days and, not only that, his family is more active too, because they keep reading his fridge notes!

How did Rashida get started?

You remember, she's a stay-at-home mum with kids aged two and four. You probably think that she already had enough exercise chasing them around, but actually, she spent a lot of time on the couch watching them play or watching TV. She felt sluggish and she had no energy and she certainly had no plans to get active.

One day her Mom phoned and told her she'd been diagnosed with osteoporosis and that her doctor said it runs in families. Her Mom had just read some brochures from the Osteoporosis Society and found out that exercise helps to prevent the disease. She wanted her daughter to do something now. Sure Mom, said Rashida, but she had no intentions of doing anything – after all, she was too tired from looking after the children. But her mother's words kept playing on her mind...

One day at the community centre she picked up a brochure about helping your children to grow up physically active and healthy. *Reading it was her first step.* She discovered all kinds of fun things she could do with her children that would also get her active. Who would have guessed that dancing in the living room counted, she thought. Rashida realized just how much time she spent sitting around.

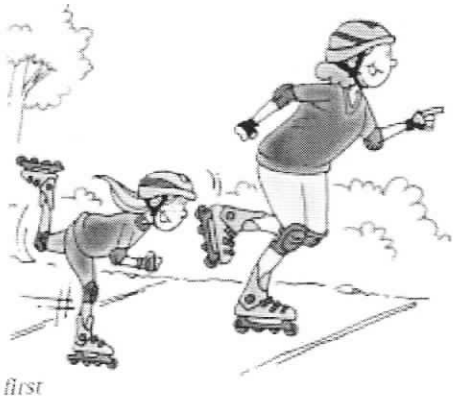
You can do it...

Getting started is easier than you think.

Rashida discovered that being physically active with her children was fun and after a few months she added more activities to her list of things to do. She spent less time sitting and more time moving. Now she's got it all worked out and her kids love dancing with her. She's even got her husband into the game and the whole family is making active living a way of life. Soon her friends began doing it too! Now, instead of having coffee and cookies while they watch their children play, the moms on her block meet at the local community centre for an exercise class, while their kids go to play group.

How did Jacqueline get started?

At 40, Jacqueline could barely keep up with work and the kids. Being a single parent was tough – no money, no time, no energy. She had seen the ParticipACTION ads on TV, but who had the time or money for that stuff – certainly not her! She watched TV to relax from the stress of work, but always woke up feeling tired the next day. What was she to do?



One day her daughter looked at her and said, "You know Mum, in school today, we learned that you have to be physically active to stay healthy. You don't do anything. I think you should start because what will happen to us if yo get sick?" Jacqueline's heart skipped a beat. She hadn't thought about it that way. But there was still the problem of no time and no money... even so, the kids didn't let up on her. Some weeks later, Jacqueline found herself in the counselling office at work, and asked if they had any information. *Her first step* was to pick up a few brochures and begin looking into physical activity and health. She chose one activity to start – she started walking with her children, after all, they were the ones who were concerned about her in the first place.

Remember, getting health benefits through physical activity only takes ONE HOUR out of the 24 hours in your day. And it can be added-up in periods of at least 10 minutes each.

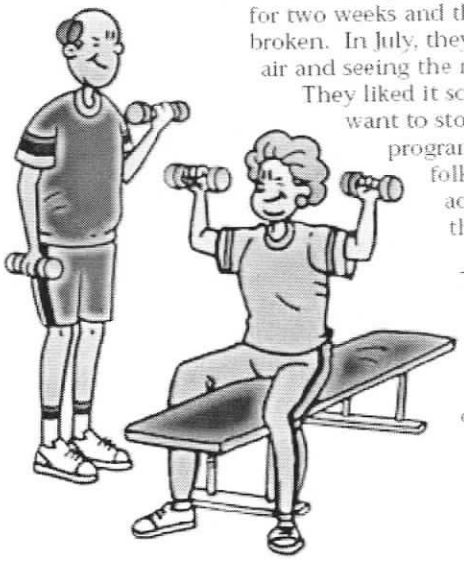
After several months, she also started walking to work. She still feels tired from the stress of balancing work and home, but she handles it better and now wakes up refreshed. She's into active living and her children are as happy as she is with her new lifestyle. Why all the fuss about 60 minutes, she wonders today, but when she started out, she really thought it would be impossible.

How did Joshua and Maria get started?

Well, Joshua had a mild heart attack at 60. His doctor told him he must start walking or he would have another one. He had a big scare, but the idea of walking every day appalled him. What should he do?

His friend Maria hardly got out of the house. Maybe they could do it together, he thought. At least he would have company. Maria thought he had gone crazy – I have enough trouble just walking around the house, she laughed. But her chiropractor had told her to walk as well. After joking about it for several weeks, the two of them decided they would do something. *Deciding to try was their first step.*

So they made a plan. They would start to walk when the weather got nice. By May 15, they had no more excuses, so they started their morning walks. In early June, Maria went to visit her daughter for two weeks and they both stopped walking – the habit was broken. In July, they tried again. It got them outside into the fresh air and seeing the neighbours and they really began to enjoy it. They liked it so much that when winter came, they didn't want to stop. Then they heard about a mall-walking program and joined that too. They met some more folks their age and found out about the seniors' activity program at the local Y and checked that out next.



Today, they are both doing at least 45 minutes of activity a day – and some days it's more than 60. They say they never thought it was possible for them to be physically active, but now it's one of the most important and enjoyable things in their lives.

How did Michel get started?

At 25, Michel has used a wheelchair for most of his life. Because of his passion for computers, he tended to spend hours-on-end in front of his computer. He was beginning to feel aches and pains in his upper body as a result of these prolonged periods of inactivity. It never occurred to him that being physically active was within his reach, or that the time he spent in front of the computer was adding to his already sedentary lifestyle. He knew his company had a gym, but was unaware that it could meet his additional needs.

Activate *Canada's Physical Activity Guide* Website!

www.paguide.com

One day he was 'surfing' the Internet and he landed on a site about the inactivity problems typical of computer users. He found that sedentary living is as dangerous to your health as smoking – a habit he had never started because he wanted to be healthy. Oops, he thought. That's me! So he looked into it further, roaming the Net looking for information on how to improve his health through physical activity. But even though he became quite knowledgeable on the subject, he still couldn't seem to get out from behind that computer!

Then one day, he found an article on the Internet that advised, "Just do one small thing to get you moving – don't try to make a grand plan right off the bat." It also said, "Whatever your situation or ability, you can try a variety of activities to improve your health and get a feel for what's right for you."

That day, he made his first move. He wheeled himself into his company's gym, met with the fitness coordinator and he's on his way to healthy active living. He found out that many facilities are accessible and that he can be active alongside his co-workers. He now feels more energetic and alert and still has plenty of time for his computer! He also bookmarked the website about *Canada's Physical Activity Guide to Healthy Active Living* to keep learning about being physically active.

Add up your activities during the day in periods of at least 10 minutes each. Start slowly... and build up! If you are already doing some light activities, move up to more moderate ones. A little is good, but more is even better, if you want to achieve health benefits.

How did Madeleine get started?

Remember, Madeleine is 17 and had spent a lot of time sitting around – a "couch potato". She skipped Phys. Ed. in school, always felt clumsy and uncoordinated when she had to do physical activities with others and preferred reading or watching TV to intramural sports or being active outdoors.

Her friends kept trying to get her to join them in physical activities both during and after school, but she always said no. The more she sat on the couch, the more tired she became. She was overweight as well. How could she possibly put on tights and go to a gym class, she would ask herself.

Gradually her friends stopped asking her to do things with them and Madeleine sat on the couch even more. Her mom told her she needed exercise so she would have more energy. She told her to get out with her friends and swim, walk, bike or dance. One day her mom gave her a copy of the *Handbook for Canada's Physical Activity Guide to Healthy Active Living* and asked her to at least read it. Do something, she said. The only idea she liked was dancing...well, maybe I can, she thought.

So she took her first step. She talked to a friend at school. The friend told her that aerobic dance class was now being offered in Phys. Ed. and suggested she come and watch. "It's fun," her friend explained. "And you like to dance, so you might decide to join us." Madeleine thought about it. She was still pretty nervous, but her friend kept encouraging her. One day she finally went and just watched. She knew a few people in the class and they sure seemed to be having fun...

Eventually, she joined in and found to her surprise that she could follow all the steps. The teacher encouraged her and so she tried another class and then another... finally she decided to take the plunge and sign-up. She liked it! Another of her friends in the class also took yoga and encouraged her to come and watch that too – so she went and watched again. This time it did not take her so long to sign-up. In just over a year, Madeleine is now in two classes, goes out Saturday nights with her friends, is no longer a couch potato, feels a lot better about herself, and is even getting better grades at school.

So what did you learn from these first steps and experiences?

- Every time you take a step you make progress.
- Planning to start is the first step for many people.
- Getting information is one step everyone can take.
- You don't need a grand plan to start.
- Congratulate yourself when you take a step.
- Getting started is easier than you think.
- Getting started can be reading about what to do, watching a class or other people to see how they do it, trying something, and getting ready to start.
- Watching a class helps you to decide if the activity is right for you.
- Try a class – many programs have free trials so you can try it without a big commitment.
- There are many ways to add physical activity to your life.
- You can start slowly and build up.
- Every little bit counts – you can add up your activities throughout the day.
- You can build physical activity into your life at home, at school, at work, at play and on the way.
- You do not have to have a lot of money to be physically active.
- You can choose activities that you like to do.
- Everyone can find enough time, if they decide to do it.
- You're never too young or too old to start living actively.
- People feel better when they are physically active.
- Physical activity can be a family thing, or you can do it on your own or with a friend.
- You can join an organized activity, or you can do something on your own, like take a walk in the park.
- The key is to take that first step and everybody's first step is different – remember each step counts as progress.
- It's easy to start. Even a call for information is a beginning and it counts as progress. Congratulate yourself – reading this *Handbook* is already a first step!

Take a minute to jot down one step that you could take now. Check out the list on this page if you can't think of one and see if there is an idea there that you can use.

My first step:

_____

_____

Date:

_____

Here's a list of possible first steps you could take this week

Are you ready to take your first step? Make it easy:

- Get some information from your local YM/YWCA or community centre.
- Call the Parks and Recreation Department in your community.
- Talk to a health professional or a physical activity expert.

Note: If you have an illness that you think might prevent you from becoming more active than you are now, check out the Physical Activity Readiness Questionnaire at the back of this *Handbook*.

- Talk to the counselling office at school or at work.
- Talk to friends who have built physical activity into their daily routines and ask them how they got started.
- Go to the library and borrow a book on physical activity and your health.
- Buy a pair of walking shoes.
- Check out what physical activity organizations exist in your community.
- Call your provincial/territorial Recreation Department.
- Check out the *Guide* Website at www.paguide.com
- Call 1-888-334-9769 for more information.
- Find out if a nearby mall has a walking route posted or a regular walking program.
- Make yourself a list of the reasons why you might want to introduce physical activity into your life.
- Make a list of the health problems you already have that physical activity might help to improve.
- Check out if there are walking paths in your community.
- Locate the parks in your community.
- Talk to a friend who might want to join you in your changing lifestyle so you can move forward together.
- Watch classes at your community centre that you might want to try.

If you are active sometimes, but not enough to achieve the health benefits described in this *Handbook*:

- Walk whenever you can – get off the bus early, park the car further away or leave it at home, and use the stairs instead of the elevator.
- Reduce inactivity for long periods, like watching TV or using the computer.
- Get up from the couch or your office chair and stretch and bend for a few minutes every hour.
- Start slowly, progress gradually.
- Start with a 10-minute walk-gradually increase the time.
- Take the stairs to go up one or two floors at work or on appointments.
- Choose to walk, wheel or cycle for short trips.
- Find out about walking and cycling paths nearby and use them.

- Observe a physical activity class to see if you want to try it.
- Try one class to start – you don't have to make a long-term commitment.
- Do the activities you are doing now, more often or with more effort.
- Check out the programs and services at the YM/YWCA or community recreation centre and see if anything interests you.
- Join a friend who is already active at the gym, on the tennis court or in the pool.

Remember, all these steps count as progress – take one, then congratulate yourself, and take another!

Build Physical Activity Into Your Daily Life:

- at home
- at school
- at work
- at play
- on the way

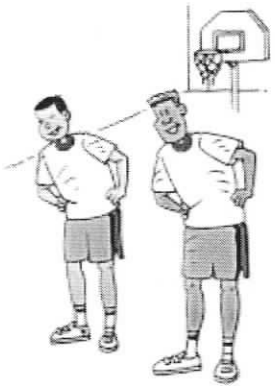
...that's active living!

Here are some ideas to help you. Choose activities that interest and appeal to you. The best way to keep going, once you've taken that first step, is to do activities that are easy to fit in your schedule and could be fun at the same time.

Take a first step and put a checkmark beside the activities in the following list that you might like to incorporate into your daily routine. To get the health benefits you want from physical activity, you need to do it regularly, so pick the ones that you think you could realistically build into your daily life.

Activities you can do at home

- ❑ Create a new morning routine. Start your day with 10 minutes of movement indoors or outdoors. Some stretching and a short walk first thing in the morning can be better than caffeine.
- ❑ Go for a bike ride.
- ❑ Trade in your power mower for a push mower.
- ❑ Park the car 10 minutes away from the store you are going to. Better yet, leave the car at home.
- ❑ If you live in a seniors' residence, start a hall-walking group. Add to your route each week and pick up friends along the way.
- ❑ Parents – play catch or fly a kite with your kids.
- ❑ Dance to your favourite up-beat music for 10 minutes a day.
- ❑ Do a physical activity routine with leaders on TV.



Activities you can do at school

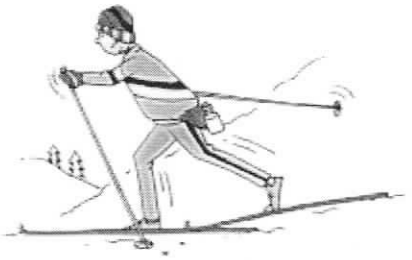
- ❑ Take an evening fitness class at your neighbourhood school, and encourage your friends to do the same.
- ❑ Support quality daily physical education at your child's school.
- ❑ Encourage teachers to talk about physical activity and active living.
- ❑ Create a walking school bus with other parents in your neighbourhood – instead of car-pooling, take turns walking the kids to school.
- ❑ Choose physical education as one of your courses.
- ❑ Get involved in intramural programs.

Activities you can do at work

- ❑ Take stretch breaks during meetings.
- ❑ Have a "walking" meeting – grab your colleague and discuss business while taking a walk.
- ❑ Take the stairs. Pretend the elevator is out of service.
- ❑ Post a notice near the entrance to the stairway suggesting people take the stairs and have them sign it when they do to encourage others to follow their lead.
- ❑ Replace your coffee break with a walking/wheeling break.
- ❑ Contract your stomach and back muscles while sitting in your chair or on the bus.
- ❑ Take a brisk walk before lunch for about 10 minutes.
- ❑ Try to make active living one of the goals of your work team.
- ❑ Roll your shoulders and stretch your neck when sitting in front of the computer.

Activities you can do at play

- ❑ Make a personal or family commitment to try a new activity each season: snowshoe, curl, hike, bike, dance, bowl, fish, camp, ice-skate, ski, swim, in-line skate, walk, run, skip rope, play tag with your kids, or play ball in the park.
- ❑ Join a club or organization that coordinates active living events.
- ❑ Participate in community programs like SummerActive and try some new activities.
- ❑ Get in the garden and dig, prune, rake and weed.
- ❑ See how many different 10-minute walking, wheeling or cycling routes you can find in your neighbourhood.
- ❑ Hit a tennis ball with a friend.
- ❑ Arrange to meet a couple of friends for a walk every day at the same time.
- ❑ Join a T'ai Chi or yoga class.
- ❑ Go line dancing, folk dancing, or square dancing.



Activities you can do on the way

- ❑ Walk, cycle, in-line skate, or wheel to work or school.
- ❑ Get off the bus two stops early and walk home.
- ❑ Leave the car in a parking lot 10 minutes from work and walk the rest of the way.
- ❑ Take your bike to work – you'll save on gas as well as help to protect the environment and your health.
- ❑ If your job involves a lot of driving, plan several short stops in your day. Get out of the car and walk for 10 minutes or more whenever you can.

Get Active Your Way, Every Day - For Life!

If you're still in doubt that physical activity is important to your health and you're not able to take the first step toward a healthier lifestyle, please read this *Handbook* again in a couple of months. Maybe then you will be ready to take your *first step*.

Remember what Pierre wrote on his fridge: *Today is the first day of the rest of my life.* It's the first day of the rest of your life too, and physical activity can help ensure you lead an independent, quality life even as you get older.

If you've made a plan, or decided how to get started, you have taken your first step – good for you!

Put *Canada's Physical Activity Guide to Healthy Active Living* on your fridge to remind you of your commitment to your health. You can also turn it over and use the calendar on the back to keep track of your activities and record your progress.

Take a minute to jot down activities you can do:

_____

_____

_____

_____

_____

The Physical Activity Readiness Questionnaire (PAR-Q)

Becoming more active is very safe for most people, but if you're in doubt, please complete the questionnaire below.

Some people should check with their doctor before they start becoming much more physically active. Start by answering the seven questions below. If you are between the ages of 15 and 69, the PAR-Q will tell you if you should check with your doctor before you start. If you are over 69 years of age, and are not used to being very active, definitely check with your doctor first.

YES	NO	
❑	❑	1. Has your doctor ever said that you have a heart condition and that you should only do physical activity recommended by a doctor?
❑	❑	2. Do you feel pain in your chest when you do physical activity?
❑	❑	3. In the past month, have you had chest pain when you were not doing physical activity?
❑	❑	4. Do you lose your balance because of dizziness or do you ever lose consciousness?
❑	❑	5. Do you have a bone or joint problem that could be made worse by a change in your physical activity?
❑	❑	6. Is your doctor currently prescribing drugs (for example, water pills) for your blood pressure or heart condition?
❑	❑	7. Do you know of any other reason why you should not do physical activity?

If you answered YES to one or more questions, talk with your doctor before you start becoming much more physically active.

If you answered NO to all questions, you can be reasonably sure that you can start becoming more physically active right now. Be sure to start slowly and progress gradually – this is the safest and easiest way to go.

Delay becoming much more active if:

- You are not feeling well because of a temporary illness such as a cold or a fever – wait until you feel better; or
- You are or may be pregnant – talk to your doctor before you start becoming much more active.

Note: If your health changes so that you then answer YES to any of the above questions, ask for advice from your fitness or health professional.

Putting It All Together – Support From Your Community

There's more to getting active than just making up your mind to do it. An active living community helps make active choices easy choices by:

- encouraging families to be active together;
- promoting physical education in schools and encouraging use of schools for community activities;
- promoting supportive physical activity policies in workplaces with things like showers, fitness facilities, flex-time and secure bike parking;
- promoting physical activity in community parks, facilities, play structures and special events; and
- sponsoring safe, active transportation through bike paths and lanes, well-lit walking trails, pedestrian-friendly neighbourhoods, and secure bike parking in association with local businesses.

Look for and ask about these things, which can often be found in your community.

For More Information or Help to Take Your First Step...

Check out these contacts to find out more about physical activity for yourself and your family:

- your local recreation department to learn more about resources and activities in your community
- YMCA, YWCA, private fitness clubs, boy scouts and girl guides
- a certified fitness professional* in your community
- your physician or another health professional
- a physical education teacher
- the coordinator of your workplace fitness/active living program, if you have one
- your community seniors' centre or association
- your local public health unit or department
- provincial health organizations such as the Heart and Stroke Foundation
- a library or bookstore for reputable books and other active living resources (you can ask a fitness professional for suggestions)

* *Ask if the fitness professionals are certified through an organization like the Canadian Society for Exercise Physiology, your provincial fitness council or the YM/YWCA.*

Call toll-free: 1-888-334-9769
Activate *Canada's Physical Activity Guide* Website:
www.paguide.com

Physical activity is an investment in your health. Make it something you want to do, not something you have to do.

Get active your way, every day - for life!

Think of minutes of physical activity as dollars in your health bank and make an investment in your health today.

Guide Endorsers

The following organizations have endorsed *Canada's Physical Activity Guide to Healthy Active Living*:

- Active Living Canada
- Active Living Alliance for Canadians with a Disability
- Active Living Coalition for Older Adults
- The Arthritis Society
- Asthma Society of Canada
- Boys and Girls Clubs of Canada
- Canadian Association of Principals
- Canadian Association for the Advancement of Women and Sport and Physical Activity
- The Canadian Association for Health, Physical Education, Recreation and Dance
- Canadian Association for School Health
- Canadian Cancer Society
- The Canadian Centre for Occupational Health & Safety
- Canadian Centre for Stress and Well-Being
- Canadian Fitness and Lifestyle Research Institute
- Canadian Home and School Federation
- Canadian Institute of Child Health
- Canadian Institute of Planners
- Canadian Intramural Recreation Association
- Canadian Labour Congress
- Canadian Medical Association
- Canadian Mental Health Association
- Canadian Nurses Association
- Canadian Parks/Recreation Association
- Canadian Physiotherapy Association
- Canadian Public Health Association
- Canadian Teachers Federation
- The College of Family Physicians of Canada
- Federal, Provincial and Territorial Ministers Responsible for Fitness, Recreation and Sport
- Federation of Canadian Municipalities
- Girl Guides of Canada
- Go for Green
- The Heart and Stroke Foundation of Canada
- Industrial Accident Prevention Association
- The Lung Association
- Osteoporosis Society of Canada
- ParticipACTION
- YMCA Canada
- YWCA of Canada

Call toll-free 1-888-334-9769

Activate *Canada's Physical Activity Guide* Website:
www.paguide.com

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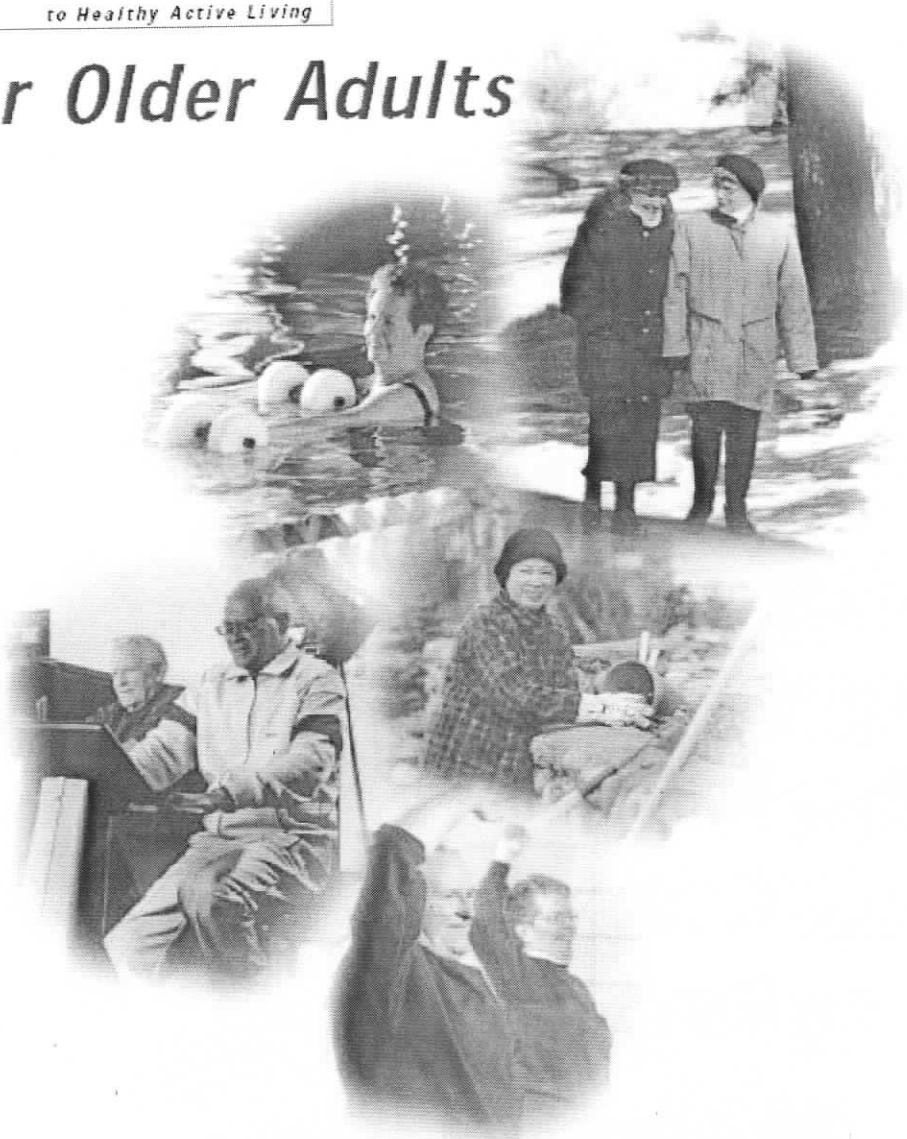
Appendix C: Health Canada's Physical Activity Guide to Healthy Active Living in Older Adults

CANADA'S
Physical Activity Guide
to Healthy Active Living

for Older Adults



Handbook

Includes pull-out copy of the Guide

Health Canada Santé Canada

ALCOA CVAA

CSEP SCPE Canadian Society for Exercise Physiology

Table of Contents

Why should I be active?

Maintain your health and independence as you age

Physical activity is one of the most important things you can do to maintain your physical and mental health and quality of life as you get older. Walking, stretching, and keeping your muscles in good condition will help you to maintain your independence.

Physical inactivity makes your body age faster

Independent living depends on being able to do the things you want to do when you want to do them. To stay independent you need to be able to reach, bend, lift, carry, and move around easily. Staying physically active will help you to keep moving, and stay strong.

Think about these facts

- 60% of older adults are inactive.
- Sitting or lying for long periods is a serious health risk.
  (World Health Organization)
- Inactivity leads to declines in:
  - bone strength;
  - muscle strength;
  - heart and lung fitness; and
  - flexibility.
- Inactivity is as harmful to your health as smoking.

Get active your way –

- **at home**
- **in your community**
- **with friends**
- **on the way to and from activities**

... that's active living!

There are many benefits from physical activity

Benefits increase as physical activity increases

If you are not very active and you start increasing your physical activity, you will start to see benefits in 4-12 weeks.

- Start slowly and gradually build up.
- Physical activity does not have to be hard to improve your health.

Take a look at the benefits you can achieve from physical activity. Check off the ones that appeal to you.

Benefits when starting out:

- ❑ Meet new people
- ❑ Feel more relaxed
- ❑ Sleep better
- ❑ Have more fun

Benefits from regular physical activity:

- ❑ Continued independent living
- ❑ Better physical and mental health
- ❑ Improved quality of life
- ❑ More energy
- ❑ Move with fewer aches and pains
- ❑ Better posture and balance
- ❑ Improved self-esteem
- ❑ Weight maintenance
- ❑ Stronger muscles and bones
- ❑ Relaxation and reduced stress

Research tells us that being active reduces the risk of:

- Heart disease
- Falls and injuries
- Obesity
- High blood pressure
- Adult-onset diabetes
- Osteoporosis
- Stroke
- Depression
- Colon cancer
- Premature death

It's never too late to get moving

You're never too old to increase your level of physical activity

Most people say they gain strength, endurance, and flexibility by becoming more active – including those in their nineties. Almost immediately, many people notice they feel better and getting around is easier.

Consider this:

- The more you move, the better you feel.
- More active older adults have the function and fitness of those much younger.
- More active people prolong their independence.

Everyone can benefit from increased physical activity

People with physical limitations and chronic conditions can also benefit by becoming more active. Increasing your level of physical activity as much as you are able can help offset many of the negative effects of certain diseases and disabling conditions.

What do experts recommend?

Choose activities from each of these activity groups – Endurance, Flexibility, Strength & Balance

The *Guide* offers you a rainbow of activities to choose from. Pull out the two-page *Guide* from the centre of this *Handbook* so you can follow along as you read further.

- Choose things you like to do or would like to try.
- Do more of what you are already doing.
- Some activities you choose will give you more than one benefit.

How much activity do I need?

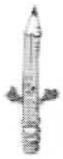
It is best to be active every day. Build physical activity into your daily routine. 30 to 60 minutes of moderate activity most days of the week will improve your health and fitness. And this is not hard to achieve!

If you have not been active, then

start with activities you can easily build into your daily routine.

Minutes count

Add up your physical activities during the day. Your goal is to build up your activities to 10-minute segments that total 30 to 60 minutes a day. Build up gradually. Don't try to do too much at once. You'll be amazed how quickly you begin to feel more energetic, stronger, and more flexible.



Here are some ideas to get you moving...

Check off the ones that you could do.

- ❑ Take a 10-minute walk each day, progressing as you can to a moderate or brisk pace;
- ❑ Wheel yourself to the park;
- ❑ Get off the bus one stop earlier and walk the rest of the way;
- ❑ Take the stairs instead of the elevator;
- ❑ Lift weights to strengthen your arms – use a weight that will challenge your muscles (you don't have to buy weights, you can use household objects);
- ❑ Move around frequently;
- ❑ Stand up and sit down several times in a row to strengthen your legs; and
- ❑ Do some stretching every day to increase your flexibility.

Add up your activities

- Start where you can and progressively build up – listen to your body.
- Accumulate 30 to 60 minutes of moderate physical activity most days of the week.
- Minutes count – add it up, aiming for 10 minutes of activity at a time.

Choose activities from all three activity groups

Choose a variety of activities

A number of activities are suggested here for each activity group. ***Check off those ideas*** that appeal to you – ideas that you might like to build into your daily routine. This is ***one step you can take*** to increase the level of activity in your life.

The Three Activity Groups

Endurance Activities:
4-7 days a week

Endurance activities help you to increase energy and keep moving for longer periods of time. They make you feel warm and breathe deeply. Endurance activities are good for your heart, lungs, circulation, and muscles.

To get the best health benefits, try to do endurance activities for at least 10 minutes at a time. You want to make your heart and muscles work. If you can't do 10 minutes when you start out, do what you can and work up to it.

Here are some activities to choose from...

Check off the ones you do now and those that interest you!

- ❑ Walking
- ❑ Swimming
- ❑ Dancing
- ❑ Skating
- ❑ Cross-country Skiing
- ❑ Cycling
- ❑ Hiking

Safety – Endurance Activities

- Begin with activities that you can do comfortably.
- Progress to moderate and vigorous activities as your endurance builds.
- Use comfortable footwear that will support your feet and ankles.
- Wear comfortable clothing.
- Wear boots that will grip on ice and snow in the winter.

Not sure where to start? *Ask your doctor, health-care, fitness, or recreation provider.*

Choose activities from all three activity groups

Flexibility Activities:
Daily

Flexibility activities help you to move more easily so that you can accomplish the daily tasks necessary for independent living and self-reliance.

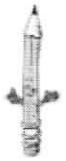
Flexibility activities help you to keep your joints healthy and maintain your mobility. They will help to ensure that you can:

- tie your shoes;
- clip your toenails;
- reach behind your back or straight up overhead;
- get down on the floor and back up again;
- get in and out of the tub; and
- reach up to that top shelf in the kitchen.

Consider doing more bending, stretching and reaching. Every little bit counts!

Here are some activities to choose from...

Check off the ones you do, or would like to do!



- ❑ Stretching
- ❑ Dancing
- ❑ Gardening
- ❑ Washing and waxing the car
- ❑ Mopping the floor
- ❑ Yard work
- ❑ Vacuuming
- ❑ T'ai Chi
- ❑ Golf
- ❑ Yoga
- ❑ Bowling
- ❑ Curling

Safety – Stretching Activities

- Start with five minutes of "stretch and hold" activities.
- Stretch slowly without bouncing or jerking the movements.
- Aim for a stretched, relaxed feeling – avoid pain.
- Breathe naturally – don't hold your breath.

Not sure where to start? *Ask your doctor, health-care, fitness, or recreation provider.*

Choose activities from all three activity groups

Strength & Balance Activities:
2-4 days a week

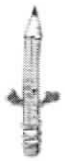
Strength activities are those that challenge all your muscles. Do more pulling, pushing, lifting, and carrying.

Strength and balance activities help you to:
- keep muscles and bones strong;
- reduce bone loss; and
- improve balance and posture.

When you maintain your strength and balance through regular activities, you:
- are less likely to fall or to have accidents that cause injuries;
- will be able to lift garbage bags, carry groceries, push and pull furniture, open jars, and carry a suitcase;
- are more able to get around safely; and
- know your personal limits.

Here are some activities to choose from...

Check off the ones that you could build into your routine!



- ❑ Lifting weights or soup cans
- ❑ Carrying the laundry
- ❑ Carrying groceries
- ❑ Climbing stairs
- ❑ Wall push-ups
- ❑ Weight-training classes
- ❑ Piling wood
- ❑ Standing up and sitting down several times in a row

Safety – Strength Training

- Start slowly – but challenge your muscles.
- Learn proper technique to protect your back and joints.
- Use weights that you can lift 10 times before they become too heavy.
- Breathe naturally– don't hold your breath.

Not sure where to start? *Ask your doctor, health-care, fitness, or recreation provider.*

Why not start here today?

This is the first day of the rest of your life!

Check off the things you want to improve...
Use the check-marks you have already made in this Handbook to help you decide.

❑ I want to have more endurance.
Activities I might want to try: _____
_____
_____

❑ I want to be able to move easier, be more flexible.
Activities I might want to try: _____
_____
_____

❑ I want to feel stronger.
Activities I might want to try: _____
_____
_____

❑ I don't know what I want to do.
I'm going to:

- ❑ visit my community centre.
- ❑ check the Yellow Pages.
- ❑ visit a seniors' centre.
- ❑ get an information video.
- ❑ find out what my friends are doing to stay active as they age.
- ❑ ask my doctor, health-care, fitness, or recreation provider what to do.
- ❑ read some more information.
- ❑ call the local recreation department.
- ❑ check out some activity classes.
- ❑ discuss this with my family.

But what if...

I feel too tired to get started?

Many of us feel that way, but most people who become physically active say that physical activity helps them feel better and gives them more energy.

It's important to choose activities that you enjoy because that will motivate you.

- ❑ Do you like to dance? Why not turn on some music you like and move to the beat.
- ❑ Do you like nature? Go for a walk and take in the scenery.
- ❑ Do you like gardening? No yard? Try a balcony garden.
- ❑ Do you like meeting new people? Check out the programs for older adults at your community centre, local Y, seniors' centre, or private fitness club.
- ❑ Talk to your friends and find out what they are doing. Maybe you could try something with one of them.

Even if you have not been very active, once you get started your body will adjust to your energy needs. Just try something... a little bit every day will make a difference.

I don't want to exercise? ...I've worked hard all my life, now it's time to relax.

Being active can help you to relax and prolong your independence. Build physical activity into your daily routine. Set yourself a small goal. Staying active is important to your physical and mental health in your retirement years. You have already taken a first step by reading this *Guide* and *Handbook*. Choose things that you like to do. Join in activities with people you like to be with. Start with small steps.

Find one activity that you could try, or do more of what you are already doing.

- ❑ Take your grandchild for a walk – grandchildren have so much energy, it might inspire you.
- ❑ Take a dog for a walk.
- ❑ Join your neighbour for a walk.
- ❑ Walk to the grocery store and carry home the groceries.
- ❑ Do some stretching every day.
- ❑ Join a class at the community centre.
- ❑ Join a mall-walking program.
- ❑ Wash and wax the car.
- ❑ Use a wheelchair? No problem. "wheeling" can be as beneficial as walking.

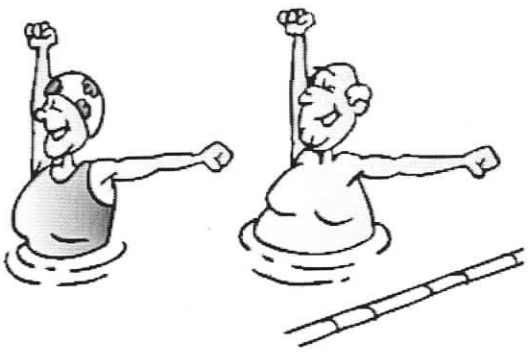
I have arthritis or stiff joints?

Then it is even more important that you make a commitment to doing gentle movements every day to keep your joints flexible. Small amounts of daily activity can make a huge difference and keep you mobile.

Flexibility and strength activities are essential to keep your muscles and joints healthy so that you stay mobile. The more sedentary your lifestyle, the stiffer your joints will become. Seek professional help if you are unsure about what is safe for you.

Here are some suggested activities:

- ❑ Home stretching routines
- ❑ Aqua fitness programs
- ❑ Specialty classes for people with arthritis
- ❑ Walking/wheeling
- ❑ T'ai Chi
- ❑ Folk or line dancing



I have osteoporosis?

Bones lose minerals and strength as people age. Serious bone loss is a problem for about 25% of older people. You can prevent some of this bone loss with strength activities.

Your muscles and bones have to be challenged to get stronger or to maintain their strength as you age. Join a beginner's program to learn some techniques that will help you improve your strength. It will help you maintain your independence and quality of life. Ask your doctor or health-care provider what would be safe for you. If you have osteoporosis, being active will still be of great benefit, but activities may need to be adapted to provide that benefit without putting you at risk.

Here are some suggested activities:

- ❑ Resistance training that challenges your muscles and bones
- ❑ Aqua fitness programs
- ❑ Walking
- ❑ Folk or line dancing
- ❑ Specialized classes for people with osteoporosis

CANADA'S

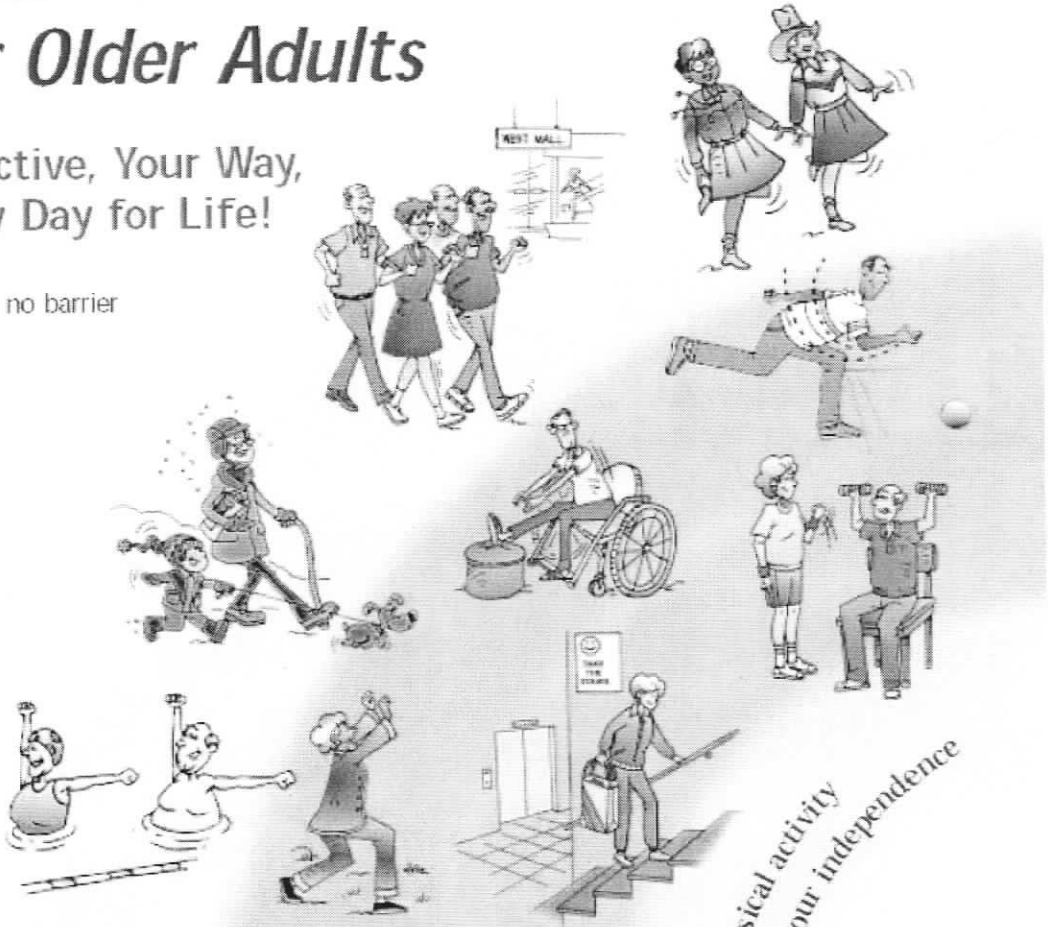
Physical Activity Guide

to Healthy Active Living

for Older Adults

Be Active, Your Way, Every Day for Life!

- Age is no barrier



Increase Endurance Activities 4-7 days a week

Increase Flexibility Activities Daily

Increase Strength & Balance Activities 2-4 days a week

Physical activity prolongs your independence

Health Canada / Santé Canada

ALCOA CVAA

CSEP SCPE Canadian Society for Exercise Physiology

Being active is very safe for most people

Start slowly and build up – listen to your body. Accumulate 30 to 60 minutes of moderate physical activity most days. Minutes count – add it up 10 minutes at a time. Not sure? Consult with a health-care professional.

Choose a variety of activities from each of these three groups:

Endurance

- Continuous activities that make you feel warm and breathe deeply
- Increase your energy
- Improve your heart, lungs, and circulatory system

Flexibility

- Gentle reaching, bending, and stretching
- Keep your muscles relaxed and joints mobile
- Move more easily and be more agile

Strength & Balance

- Lift weights, do resistance activities
- Improve balance and posture
- Keep muscles and bones strong
- Prevent bone loss

Getting started is easier than you think

- Build physical activity into your daily routine.
- Do the activities you are doing now, more often.
- Walk wherever and whenever you can.
- Start slowly with easy stretching.
- Move around frequently.
- Take the stairs instead of the elevator.
- Carry home the groceries.
- Find activities that you enjoy.
- Try out a class in your community.

For a free copy of the companion *Handbook* and more information: **1-888-334-9769**, or *Web site:* **www.paguide.com**

Eating well is also important. Follow *Canada's Food Guide to Healthy Eating* to make wise food choices.

Benefits increase as physical activity increases

Benefits when starting out:

- Meet new people
- Feel more relaxed
- Sleep better
- Have more fun

Benefits from regular physical activity:

- Continued independent living
- Better physical and mental health
- Improved quality of life
- More energy
- Move with fewer aches and pains
- Better posture and balance
- Improved self-esteem
- Weight maintenance
- Stronger muscles and bones
- Relaxation and reduced stress

Scientists have proved that

Being active reduces the risk of:

- Heart disease
- Falls and injuries
- Obesity
- High blood pressure
- Adult-onset diabetes
- Osteoporosis
- Stroke
- Depression
- Colon cancer
- Premature death

CANADA'S **Physical Activity Guide** to Healthy Active Living for Older Adults

Move Better, Feel Bett

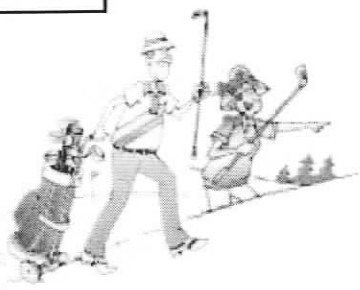
You can do it - Getting started is easier

Sunday	Monday	Tuesday	Wednesday

er, Be Better

than you think. Keep track of your activities. Record your progress.

Thursday	Friday	Saturday



But what if...

I have concerns about my heart? ...I'm afraid that physical activity will do more harm than good.

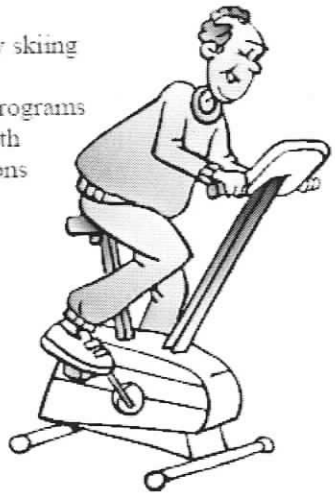
Doctors usually recommend activity programs for heart patients. Talk to your doctor or other health-care professional and choose a program that is right for you.

They will probably recommend walking, which is one of the best activities to stimulate your circulation, improve the pumping of your heart, strengthen your lungs, improve your mood, and provide energy to your muscles.

Check out some good walking paths in your community and do one each day to get you started. Ask a friend to join you and make your walk a social outing. Join a mall-walking program where you can meet new people.

Here are some suggested activities:

- ❑ Walking at a moderate pace progressing to a brisk pace as you are able
- ❑ Swimming
- ❑ Dancing
- ❑ Skating
- ❑ Cross-country skiing
- ❑ Cycling
- ❑ Specialized programs for people with heart conditions



I am unsteady on my feet?

If your balance is poor, start by doing some activities on a chair, on your bed, or supported by a wall. As you feel stronger, add more activities. You will notice that your strength and balance increase as you progress. If you are not sure what to do, seek help from a health-care professional.

Here are some ideas to get you started:

- ❑ Exercises in a sitting or lying position
- ❑ Simple yoga movements or stretching
- ❑ Slow walking with a cane or with the support of a friend
- ❑ Leg and ankle strengthening
- ❑ T'ai Chi
- ❑ Line dancing while holding hands

I'm afraid to go out in winter?

There are devices to help you deal with the ice and snow. You can get "picks" to add to your cane to grip the ice. Get some boots that will give your feet a firm grip. Some people use old ski poles to steady themselves or they buy cleats for their boots. If you still feel that it is unsafe for you to walk outside, try a mall-walking program or, if you live in an apartment, walk the halls.

Check out activity programs in your neighbourhood. Often the staff can help you arrange transportation to an activity. Check out what your neighbours and friends are doing and see if you can join them.

The key is to keep moving, even in winter.

I don't have much time... so which activity is best?

It's best to choose activities that you like and build them into your daily routine. As long as you choose activities from each of the three groups – endurance, flexibility, and strength and balance – your program will give you health benefits and improved function and quality of life.

- ❑ Move frequently
- ❑ Dance
- ❑ Vacuum
- ❑ Walk the stairs in your house or apartment
- ❑ Wash the floors
- ❑ Do some stretches
- ❑ Clean up one of the shelves in your kitchen cupboards
- ❑ Go for a ten-minute walk
- ❑ Walk to the grocery store and carry home the groceries
- ❑ Wash and wax the car

Every little bit helps, but more is better. The more you do, the better you'll feel. Increase your activities as your body adjusts to your new physically active lifestyle.

Being active is easier than you think

Let's look at a typical week for someone like you who is physically active...

Add it up – 30 to 60 minutes a day built right into your routine

Use the Calendar on the back of the Guide to plan your week

Sunday	Stretching	Meet bird-watching group for the afternoon		Walk to a friend's house and back after dinner (10 minutes each way)
Monday	Take the linen off the beds and wash, re-make the beds	Aqua fitness class at community centre (45 minutes)		Walk with a friend after supper (15 minutes)
Tuesday	Clean some shelves in the kitchen	Walk to the park in summer, in the mall in winter (30 minutes)	Wash the kitchen floor, or wash and wax the car	Lift some weights or soup cans to strengthen arms
Wednesday	"Stretch and hold" exercises	Go to the store and carry home the groceries (30 minutes)	Work in the yard	Walk after supper with grandchildren and their dog
Thursday	Stretching	Walk to the doctor's office or some other appointment (20 minutes)		Folk dance class at community centre (30 minutes)
Friday	"Stretch and hold" exercises	Go to the mall and take stairs instead of elevator – meet some friends for lunch	Lift some weights while watching TV – focus on arms	Work in yard
Saturday	Try a yoga program on TV	Go to the store and carry home groceries (30 minutes)	Vacuum (10 minutes)	Lift some weights while watching TV – focus on legs

- Be physically active every day
- Start where you can and gradually build up
- Every little bit counts
- Add it up! Add up a variety of activities each day in order to reach your goals

Let's see how some people like you got started

Meet Maria

Maria is 80 years old and frail. She walks with a cane. At her last check-up her doctor told her she needed to build more physical activity into her life. She laughed. "Doctor, I'm 80 years old and now I'm supposed to worry about getting exercise?" "You will, if you want to stay living independently," her doctor told her. "If you sit around cooped up in your house, you will get weaker and weaker and soon you won't be able to do the things you want to do." Maria was shocked. She thought about getting out, but she was too tired.

Bird-watching with a friend got her attention

One day a friend of hers told her that she was walking every day and had taken up bird-watching with others. Her friend suggested they go together. As Maria made friends in the group she found out about a yoga class for people just like her and she joined that as well.

More active, feeling stronger

She still walks with a cane or with the support of a friend but enjoys walking in the outdoors or at the mall. She admits she now has more energy.

Let's see how some people like you got started

Meet Jason

Jason is 68. He had a mild heart attack. He was sedentary and his doctor insisted that he needed to be more physically active. His first reaction was fear that strenuous activity would cause another attack. However, his doctor referred him to a local Cardiac Rehabilitation Program. "Start slowly and progress gradually," his doctor said. "You'll feel better, your heart muscle will grow stronger, and you will be able to do more of the things you want to do with less worry."

Met other people with heart trouble and started to feel better

Jason was a little nervous the first day he went to the program but the instructors and other participants made him feel welcome very quickly. The program involved walking and stationary cycling, and an instructor led the group through flexibility, endurance, and strength activities. Jason was shown how to monitor his heart rate and effort level and to learn what the right activity level "felt like." Other participants shared their experiences with Jason, telling him how much better they felt as a result of the program.

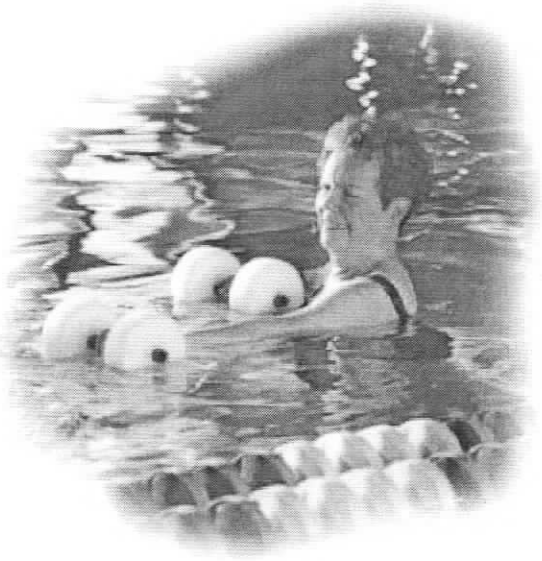
No longer afraid and feeling much more able

After a couple of months, Jason was feeling pretty good and had really built-up his confidence. The program meets twice a week and he wouldn't miss it for anything. He and a few buddies from the program also get together a few times a week on their own to go for a walk, ride the stationary bike, or go for a swim at the community centre. They plan to do some cycling on the local bike trails when the warmer weather comes. Jason finds himself taking the stairs instead of the elevator most of the time, and he is no longer out of breath doing simple tasks around the house.

Let's see how some people like you got started

Meet Elsa

Elsa is 75. She had always loved the water, but she didn't have the energy to go swimming as she had done when she was younger. She missed her activities and was beginning to spend a lot of time watching TV. The more she sat around, the more tired she got. She was beginning to find that even simple chores around the house were becoming difficult. She was having trouble washing and combing her own hair. She was worried. She did not want to end up dependent on her family – she enjoyed her independence, but her physical limitations were beginning to scare her.



Family helps to get Elsa moving

When Elsa's daughter tried to find out what was bothering her mother, all she heard was, "I'm just getting too old." Elsa's daughter went to the Y and looked for some literature about helping older adults cope and then talked to a professional. She offered to take Elsa to the Y and help her try some things.

Her love of the water got her active again

At the pool, Elsa saw a class of older women just like her in the water. They were joking and laughing and seemed to be having such a good time. They were doing water aerobics in a heated pool. Maybe I could do that, she thought. The instructor suggested that Elsa come and try a couple of classes before she signed up. After a few weeks, she found herself actually enjoying it and making some new friends as well. The instructor was helping her build up the strength in her arms as well with small weights before the water program. She now feels stronger and more able to cope and is not as fearful about losing her independence and quality of life. She now has no trouble washing and combing her hair. Her new friends asked her to join them for a mall-walking program in the winter, and in the summer they walk in the neighbourhood park.

Let's see how some people like you got started

Meet Li

Li is 65. She is a small woman and has never been very strong, but she has always loved gardening. She had become very depressed and bored after she retired from her job. She began to sleep a lot and rarely did any activity. She missed her yard since she moved to an apartment and did not know what to do with her time.

Community garden allotments help Li get active again

Li's friends began to worry about her and found her a garden plot very close to the seniors' apartments where she was living. Li was thrilled and determined to make it the best garden on the block. Every day she is out there digging, weeding, planting, and trimming...and her energy level has improved. But what was she going to do in the winter? One of the other gardeners told her about a mall-walking program and asked her to join it with her. Through her new friends she found out about a T'ai Chi class as well, and she loves it so much she now does it summer and winter. Getting physically active changed Li's life. She has a whole group of new friends. Her spirits have lifted and she feels stronger and more secure.

Let's see how some people like you got started

Meet Louis

Louis is 72. He was very active until he retired and then his life changed. He began to sit around, read, and watch TV – after all, he was retired and it was time to take it easy. He soon found himself getting very sluggish and stiff. Often he found himself staying in bed until noon and yet he was still tired.

Friend tells him to get moving

"Just because you have retired doesn't mean you can sit around all the time," his friend told him. "Your body needs to move to live." Louis decided to join a physical activity program at his community centre with his friend. They had special rates for seniors so it wasn't going to cost him very much. A fitness professional at the community centre helped him develop a program that would build his strength and endurance as well as increase his flexibility. At first, he found it hard. His muscles were out of shape, but he kept at it. He has found some buddies his own age and they encourage each other on the stationary bikes and in the weight room. His energy has improved and he no longer feels sluggish and tired.

Taking the first step is the hardest part

Just like you, all of these people had to take a first step. Healthy aging and independent living depend upon physical activity. What types of activities interest you? Choose something that you want to do. Start slowly and build up gradually until you are able to do 30 to 60 minutes of moderate activity most days of the week.

And remember, choose activities that will:

- build your endurance;
- increase your flexibility; and
- improve your strength and balance.

If you still don't know what you would like to do, maybe your first step is to get more information and more ideas from health-care professionals, community centres, and your friends.

My next steps

❑ Preserving my health and prolonging my independence are important to me

Review all the things that you checked off as you were reading this Handbook. These ideas will help you to make a plan for yourself!

My next steps – My first goals:

❑ I am going to post the *Guide* on my refrigerator to remind me to stay active.
❑ I will walk for at least 10 minutes every day.
❑ I will move around frequently during the day.
❑ I am going to stretch every day.
❑ I am going to check out activity programs at my community centre.
❑ I will carry my groceries.
❑ I am going to dance to my favourite music.
❑ I will walk instead of drive every chance I get.
❑ I will use the stairs instead of the elevator.
❑ I will do at least one activity from each of the three activity groups every day.
❑ I am going to wash and wax the car myself.
❑ I am going to get off the bus one stop earlier and walk.
❑ I am going to find a friend to be active with.
❑ I am _____
❑ I am _____
❑ I am _____
❑ I want to _____
❑ I want to _____

If you still can't decide:

❑ Talk to your doctor, a health-care provider, or someone at the community centre.
❑ Check out group activities that might interest you. Sometimes it is easier to get started if you do something with a group of people.
❑ Talk to your friends about what they are doing to stay active.
❑ Try new things. This can help you to get moving and have fun. You can meet new people and improve your health!

Support from your community

Check out these community contacts to see what can help you build physical activity into your life:

- Talk to the local recreation department to see what programs they have for older adults;
- Ask about safe walking paths and mall-walking programs in your community;
- Check out the seniors' centres in your neighbourhood;
- Ask the local Y or fitness clubs if they have programs at a reduced cost for older adults;
- Visit health centres and clinics to help you plan a program;
- Ask physicians or other health-care providers to help you decide what's right for you;
- Approach health organizations such as The Osteoporosis Society, Heart and Stroke Foundation, and The Arthritis Society to help you choose programs that are right for you;
- Visit libraries and bookstores to get information about physical activity; and
- Ask your local health department to help you find what is available in your community.

Communities can make it easier for everyone to be more physically active.

An active living community helps make active choices easy choices by:

- encouraging community use of schools for older adult physical activity programs;
- recruiting older adults as volunteers in supervising young children in active (walking) transportation to and from school;
- promoting physical activity in community parks, recreation facilities, older adult residences, and special events;
- opening shopping centres to facilitate walking programs in the winter;
- facilitating transportation to and from physical activity programs for older adults in need; and
- sponsoring safe, active transportation through bike paths and lanes, well-lit and scenic walking trails, pedestrian-friendly neighbourhoods, snow- and ice-cleared walkways, and secure bike parking at local businesses.

Ask your community leaders what they are doing to help people like you be physically active in your community.

Endorsers

The following organizations have endorsed *Canada's Physical Activity Guide to Healthy Active Living for Older Adults*:

- Active Living Alliance for Canadians with a Disability
- Active Living Canada
- The Arthritis Society
- Asthma Society of Canada
- CARP, Canada's Association for the Fifty-Plus
- Canadian Academy of Sport Medicine
- Canadian Association for the Advancement of Women & Sport & Physical Activity
- Canadian Association for Community Care
- Canadian Association of Cardiac Rehabilitation
- Canadian Association of Gerontology
- Canadian Association of Occupational Therapists
- Canadian Association of Social Workers
- Canadian Cancer Society
- Canadian Centre for Activity and Aging
- Canadian Centre for Occupational Health & Safety
- Canadian Centre for Stress and Well-Being
- Canadian Chiropractic Association
- Canadian Diabetes Association
- Canadian Ethnocultural Council
- Canadian Fitness and Lifestyle Research Institute
- Canadian Forces Personnel Support Agency
- Canadian Home Care Association
- Canadian Institute of Planners
- Canadian Massage Therapist Alliance
- Canadian MedicAlert Foundation
- Canadian Mental Health Association
- The Canadian National Institute for the Blind
- Canadian Nurses Association
- Canadian Parks and Recreation Association
- The Canadian Physiotherapy Association
- Northern Educational Centre for Aging and Health
- Canadian Public Health Association
- Canadian Red Cross
- Canadian Senior Games Association
- The College of Family Physicians of Canada
- Dietitians of Canada
- Elderhostel Canada
- Federal Superannuates National Association
- Federation of Canadian Municipalities
- Go for Green
- Heart and Stroke Foundation of Canada
- Industrial Accident Prevention Association
- Institute for Positive Health for Seniors
- The Lung Association
- National Aboriginal Diabetes Association
- The National Advisory Council on Aging
- National Indian & Inuit Community Health Representatives Organization
- National Pensioners and Senior Citizens Federation
- One Voice, The Canadian Seniors Network
- The Osteoporosis Society of Canada
- ParticipACTION
- The Royal Canadian Legion
- Society of Obstetricians and Gynaecologists of Canada
- Victorian Order of Nurses for Canada
- YMCA Canada
- YWCA of Canada

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Also available in alternate formats upon request.

Canada's Physical Activity Guide
c/o Canada Communications Group
Ottawa, Ontario
K1A 0S7

Cat. No. H39-429/1999-2E
ISBN 0-662-27780-5

Appendix D: Beliefs about Endurance, Strength and Flexibility Physical Activity (used in Pilot work by Rhodes (2004))

(Beliefs about Endurance Physical Activity)

Endurance activities range from walking to organized exercise programs and recreational sports. Here are some examples of endurance activities:

- Brisk walking or running
- Golfing (without a ride-out cart)
- Yard and garden work
- Cycling
- Continuous swimming
- Dancing
- Tennis

Please list all of the things that come to mind when answering the following questions.

(1) What are the advantages of accumulating at least 30 minutes of moderate intensity endurance activity 4-7 days per week over the next month?

(2) What are the disadvantages of accumulating at least 30 minutes of moderate intensity endurance activity 4-7 days per week over the next month?

(3) Is there anything else you associate with accumulating at least 30 minutes of moderate intensity endurance activity 4-7 days per week over the next month?

(4) Are there any individuals or groups who would approve of you accumulating at least 30 minutes of moderate intensity endurance activity 4-7 days per week over the next month?

(5) Are there any individuals or groups who would not approve of you accumulating at least 30 minutes of moderate intensity endurance activity 4-7 days per week over the next month?

(6) Are there any other individuals or groups who come to mind when you think about accumulating at least 30 minutes of moderate intensity endurance activity 4-7 days per week over the next month?

(7) What factors or circumstances would enable you to do at least 30 minutes of moderate intensity endurance activity 4-7 days per week over the next month?

(8) What factors or circumstances would make it difficult or impossible for you to do at least 30 moderate intensity endurance activity 4-7 days per week over the next month?

(9) Are there any other issues that come to mind when you think about the difficulty of doing at least 30 minutes of moderate intensity endurance activity 4-7 days per week over the next month?

(Beliefs about Strength Physical Activity)

Strength activities are those that require you to work your muscles against some form of resistance. Here are some examples of strength activities:

- Weight or strength-training routines
- Carrying bags of groceries from the store
- Exercises such as abdominal crunches and push-ups
- Heavy yard work such as cutting and piling wood, or raking and carrying leaves

Please list all of the things that come to mind when answering the following questions.

(10) What are the advantages of performing strength activities 2-4 days per week over the next month?

(11) What are the advantages of performing strength activities 2-4 days per week over the next month?

(12) Is there anything else you associate with performing strength activities 2-4 days per week over the next month?

(13) Are there any individuals or groups you can think of who would approve of you performing strength activities 2-4 days per week over the next month?

(14) Are there any individuals or groups you can think of who would not approve of you performing strength activities 2-4 days per week over the next month?

(15) Are there any other individuals or groups who come to mind when you think about performing strength activities 2-4 days per week over the next month?

(16) What factors or circumstances would enable you to perform strength activities 2-4 days per week over the next month?

(17) What factors of circumstances would make it difficult or impossible for you to perform strength activities 2-4 days per week over the next month?

(18) Are there any other issues that come to mind when you think about the difficulty of performing strength activities 2-4 days per week over the next month?

(Beliefs about Flexibility Physical Activity)

Flexibility activities include gentle reaching, bending, and stretching of all your muscles groups. Here are some examples of flexibility activities:"

- Stretching exercises
- Tai Chi
- Yoga
- Dance

Please list all of the things that come to mind when answering the following questions.

(19) What are the advantages of performing flexibility activities 4-7 days per week over the next month?

(20) What are the disadvantages of performing flexibility activities 4-7 days per week over the next month?

(21) Is there anything else you associate with performing flexibility activities 4-7 days per week over the next month?

(22) Are there any individuals or groups you can think of who would approve of you doing flexibility activities 4-7 days per week over the next month?

(23) Are there any individuals or groups you can think of who would not approve of you doing flexibility activities 4-7 days per week over the next month?

(24) Are there any other individuals or groups who come to mind when you think about doing flexibility activities 4-7 days per week over the next month?

(25) What factors or circumstances would enable you to perform flexibility activities 4-7 days per week over the next month?

(26) What factors or circumstances would make it difficult or impossible for you to perform flexibility activities 4-7 days per week over the next month?

(27) Are there any other issues that come to mind when you think about the difficulty of performing flexibility activities 4-7 days per week over the next month?

The next part of the questionnaire is needed to help us understand the characteristics of the individuals participating in this study. For this reason it is very important information. All information is held in strict confidence and its presentation to the public will be in the form of group data only.

1. "What is your age?"____

2. Gender: Male____ Female____**(Please mark one)**

3. "What is your ethnicity/race?"**(Please fill-in)**_____

4. "What is the highest level of education that you have completed?" **(Please mark one only)**

8th grade or less____	Vocational school or some college____
Some high school____	College degree____
High school diploma____	Professional or graduate degree____

5. "What is your **current** marital status?" **(Please mark one only)**

Never married____	Separated____
Married____	Divorced____
Living with a partner____	Widowed____

6. "What is you **current** job situation? (**Please mark one only**)

Homemaker____

Retired____

Paid full-time employment____

Paid part-time employment____

7. "What is your approximate annual income?" (**Please mark one only**)

$5,000 or less____	$20, 001-$40,000____
$5, 001-$10,000____	$40, 001-$75, 000____
$10 ,001-$20, 000____	More than $75, 000____

8. Height:____feet____inches Weight:_____pounds **(Please fill-in)**

'The survey is now complete. Thank you kindly for taking the time to assist Aviva in her study by answering the survey. This information you have provided me with will be very helpful to Aviva and Dr. Ryan Rhodes in designing specific motivational information materials for individuals interested in starting to become physically active. Once again thank you for your time".

Appendix E: Notice of Research for Experimental Group

Behavioural Medicine Laboratory UVic

University of Victoria

Notice of Research Study

My name is Aviva Kliman and I am a Graduate student in the School of Physical Education at the University of Victoria. I am currently working under the supervision of Dr. Ryan Rhodes (assistant professor and director of the Behavioural Medicine Laboratory at the University of Victoria). As part of my degree fulfillment, I will be conducting a study in the area of Physical Activity and Health. By sending you this package, I am inviting you to take part in my study. My co-investigator in this study is my supervisor Dr. Ryan Rhodes. This study is being partially funded by the Michael Smith Foundation for Health Research and has met the rigorous requirements for ethical approval by the University of Victoria Ethics Committee.

Previous research has shown that regular physical activity may be beneficial to the physical fitness and quality of life of Canadian citizens. However, researchers have also found that many individuals have difficulty in maintaining and adhering to a regular physical activity program. In this study, we are trying to examine the beliefs about three types of activities recommended by Health Canada. The activities are strength, flexibility, and endurance oriented. This information will be very helpful to us in designing specific motivational information materials for individuals interested in starting to become physically active. We hope that you will assist us by taking parting this study.

Here are some answers for the possible questions or concerns you may have with regards to participating in this study:

What do I have to do to participate?
Your participation in this study is actually quite easy. All we ask is that you **first** sign the enclosed participant consent form, **then** read the enclosed guide from Health Canada **which corresponds to your age** (if you are aged 18-64 please use the guide for ADULTS, and if you are aged 65 years and older, please use the guide for OLDER ADULTS) and its accompanying handbook, **and then** complete the enclosed questionnaire and mail it back to us in the provided return envelope at your earliest convenience. **It's that simple!** Filling out the entire questionnaire should take less than 20 minutes of your time. Participation in this study may cause some inconvenience to you, including asking you to think about your previous experience with exercise. However, there are no known or anticipated risks to you by participating in this study. You may refuse to answer any question in the questionnaire.

We will be contacting you again in one month's time through a mail-out, which will contain a questionnaire for you to fill out regarding your physical activity frequency and your physical activity intentions. This questionnaire should take no more than 5 minutes to complete.

Your anonymity will be partially protected. Your name and personal information has not and will not be released to anyone other than the investigators. Once you return the initial

questionnaires we will be able to identify your questionnaire based on a number that we'll have pre-written on the return envelopes provided in the questionnaire package. This number will allow us to find the second label with your name and address on it that will be placed on the envelope containing the one-month follow-up questionnaire. Only the primary investigator (Aviva Kliman) and co-investigator (Dr. Rhodes) will have access to participant names, and all results will be interpreted and displayed as group data only. No individual cases will be identified.

Your confidentiality and the confidentiality of the data will be protected. Only the primary investigator (myself) and the co-investigator (my supervisor, Dr. Ryan Rhodes) will have access to your information. All data will be kept in a locked filing cabinet in the Behavioural Medicine Research lab at the University of Victoria, to which only the investigators will have access. All results will be reported according to group, and will not include names of participants. The original questionnaires will be shredded within 5 years time.

But I am not physically active and so I won't be of any help!
Yes you will! By understanding the issues of **both** active and inactive individuals we can hope to gain a greater understanding of all that is involved in the decision of whether or not to be physically active. By answering this questionnaire you will be helping us understand physical activity behaviour, which we will be able to apply to the programming of physical activity opportunities within the communities in the effort to increase participation rates. Your answers on the questionnaire are very valuable to us whether you are currently physically active or not.

Do I have to participate?
Of course not! Your participation in this study is completely voluntary. If you have any questions about the study, or about completing the questionnaire, do not hesitate to call us at the number provided below. If you chose to withdraw from the study at any time, you can contact the investigators and ask to be withdrawn from the study, or you can simply not return the questionnaire to us and ignore any additional mailing you receive from us.

Aside from being reported in my thesis, It is anticipated that the results of this study will be shared at scholarly conferences, and published in scientific journals, and be reported directly to Health Canada's Physical Activity Unit.

In addition to being able to contact Aviva Kliman or Dr. Ryan Rhodes at (250) 721-8384, you may verify the ethical approval of this study, or may raise any concerns you might have, by contacting the Associate Vice President, Research at the University of Victoria (250) 472 4362.

Appendix F: Notice of Research for Control Group

Notice of Research Study

My name is Aviva Kliman and I am a Graduate student in the School of Physical Education at the University of Victoria. I am currently working under the supervision of Dr. Ryan Rhodes (assistant professor and director of the Behavioural Medicine Laboratory at the University of Victoria). As part of my degree fulfillment, I will be conducting a study in the area of Physical Activity and Health. By sending you this package, I am inviting you to take part in my study. My co-investigator in this study is my supervisor Dr. Ryan Rhodes. This study is being partially funded by the Michael Smith Foundation for Health Research and has met the rigorous requirements for ethical approval by the University of Victoria Ethics Committee.

Previous research has shown that regular physical activity may be beneficial to the physical fitness and quality of life of Canadian citizens. However, researchers have also found that many individuals have difficulty in maintaining and adhering to a regular physical activity program. In this study, we are trying to examine motivation for physical activity—specifically those activities recommended by Health Canada. The activities are strength, flexibility, and endurance oriented. This information will be very helpful to us in designing specific motivational information materials for individuals interested in starting to become physically active. We hope that you will assist us by taking parting this study.

Here are some answers for the possible questions or concerns you may have with regards to participating in this study:

What do I have to do to participate?
Your participation in this study is actually quite easy. All we ask is that you simply sign the enclosed consent form, complete the enclosed questionnaire, and send both the signed consent form and the completed questionnaire back to us in the provided return envelope at your earliest convenience. **It's that simple!** Filling out the entire questionnaire should take less than 20 minutes of your time. Participation in this study may cause some inconvenience to you, including asking you to think about your previous experience with exercise. However, there are no known or anticipated risks to you by participating in this study. You may refuse to answer any question in the questionnaire.

We will be contacting you again in one month's time through a mail-out, which will contain a questionnaire for you to fill out regarding your physical activity frequency and your physical activity intentions. This questionnaire should take no more than 5 minutes to complete.

Your anonymity will be partially protected. Your name and personal information has not and will not be released to anyone other than the investigators. Once you return the initial questionnaires we will be able to identify your questionnaire based on a number that we'll have

pre-written on the return envelopes provided in the questionnaire package. This number will allow us to find the second label with your name and address on it that will be placed on the envelope containing the one-month follow-up questionnaire. Only the primary investigator (Aviva Kliman) and co-investigator (Dr. Rhodes) will have access to participant names, and all results will be interpreted and displayed as group data only. No individual cases will be identified.

Your confidentiality and the confidentiality of the data will be protected. Only the primary investigator (myself) and the co-investigator (my supervisor, Dr. Ryan Rhodes) will have access to your information. All data will be kept in a locked filing cabinet in the Behavioural Medicine Research lab at the University of Victoria, to which only the investigators will have access. All results will be reported according to group, and will not include names of participants. The original questionnaires will be shredded within 5 years time.

But I am not physically active and so I won't be of any help!
Yes you will! By understanding the issues of **both** active and inactive individuals we can hope to gain a greater understanding of all that is involved in the decision of whether or not to be physically active. By answering this questionnaire you will be helping us understand physical activity behaviour, which we will be able to apply to the programming of physical activity opportunities within the communities in the effort to increase participation rates. Your answers on the questionnaire are very valuable to us whether you are currently physically active or not.

Do I have to participate?
Of course not! Your participation in this study is completely voluntary. If you have any questions about the study, or about completing the questionnaire, do not hesitate to call us at the number provided below. If you chose to withdraw from the study at any time, you can contact the investigators and ask to be withdrawn from the study, or you can simply not return the questionnaire to us and ignore any additional mailing you receive from us.

Aside from being reported in my thesis, It is anticipated that the results of this study will be shared at scholarly conferences, and published in scientific journals, and be reported directly to Health Canada's Physical Activity Unit.

In addition to being able to contact Aviva Kliman or Dr. Ryan Rhodes at (250) 721-8384, you may verify the ethical approval of this study, or may raise any concerns you might have, by contacting the Associate Vice President, Research at the University of Victoria (250) 472 4362.

Appendix G: Questionnaire Used in this Thesis

University of Victoria

Physical Activity in the Greater Victoria Area

Aviva Kliman – University of Victoria, Masters Candidate
Supervisor: Dr. Ryan Rhodes – University of Victoria

Instructions

If you have decided to participate in our study, please begin this *Questionnaire Package* by reading all of the instructions thoroughly, and then answer the questions to the best of your knowledge. If you choose not to answer any question, just leave it blank and move to the next question. We need the most complete information possible to include your input into our results. When you are through, please place this *Questionnaire Package* into the self-addressed, stamped envelope and place it in the mail. Thank you again for participating in our study and we look forward to your input!

If you have any questions about completing the questionnaire, please call

Aviva Kliman (250) 721-8384 or

Ryan Rhodes (250) 721-8384

Behavioural Medicine Laboratory UVic

We would like to ask you about your beliefs and behaviors regarding strength, endurance, and flexibility activities. Please carefully read our definition of each of these three terms, and use these definitions when responding to the items on this questionnaire. Although some of the questions may seem redundant, please try to respond to all questions as all questions are important for the reliability and validity of this questionnaire.

Endurance Physical Activities

.Endurance activities range from walking to organized exercise programs and recreational sports. When we refer to endurance activities in this questionnaire, we would like you to think of activities performed at a strenuous or moderate (light sweating, slightly heavy breathing) intensity for about 30 minutes. Please do not consider activities requiring only light or minimal intensity such as slow walking. Here are some examples of endurance activities:

* brisk walking or running
* golfing (without a ride-on cart)
* yard and garden work
* cycling
* skating
* continuous swimming
* tennis
* dancing

Strength Physical Activities

Strength activities are those that make you work your muscles against some kind of resistance. Here are some examples of strength activities:

* heavy yard work, such as cutting and piling wood
* raking and carrying leaves
* exercises like abdominal curls and push-ups
* weight/strength-training routines

Flexibility Physical Activities

Flexibility activities include gentle reaching, bending, and stretching of all your muscle groups. Here are some common examples of flexibility activities:

* stretching exercises
* T'ai Chi
* yoga
*dance

PART 1: Past Physical Activity

For this next question, we would like you to recall your average weekly endurance, strength, and flexibility activity over the past 2 months.

When answering these questions please:

- consider your average weekly activity over the 2 past months.
- note that the main difference between the three categories is the intensity of the activity.
- please write the average frequency on the first line and the average duration on the second line.

a. ENDURANCE ACTIVITY

(e.g., brisk walking or running, golfing (without a ride-on cart), yard and garden work, cycling, skating, continuous swimming, tennis, dancing)

Strenuous Intensity (HEART BEATS RAPIDLY, SWEATING)

Times Per Week **Average Duration (min.)**

_____ _____

Moderate Intensity (NOT EXHAUSTING, LIGHT PERSPIRATION)

Times Per Week **Average Duration (min.)**

_____ _____

Mild Intensity (MINIMAL EFFORT, NO PERSPIRATION)

Times Per Week **Average Duration (min.)**

_____ _____

b. STRENGTH ACTIVITY

(e.g., heavy yard work, such as cutting and piling wood, raking and carrying leaves, exercises like abdominal curls and push-ups, weight/strength-training routines)

Times Per Week **Average Duration (min.)**

_____ _____

c. FLEXIBILITY ACTIVITY

(e.g., stretching exercises, T'ai Chi, yoga, dance)

Times Per Week **Average Duration (min.)**

_____ _____

EXAMPLE QUESTIONS

Before you begin answering the next set of questions, here are a few examples of the types of questions you will be asked, and some examples showing you how to answer them.

Example Question 1:
These questions ask for your beliefs about endurance, strength, and flexibility activities. Please answer each question by circling the number that best represents your belief using the following numerical scale as a yardstick.
*The numbers on the scale correspond with the following statements:

1	2	3	4	5
strongly disagree	disagree	neutral (neither agree nor disagree)	agree	strongly agree

Over the next month doing the following activities would: **make me healthy**::

Endurance Activities (4-7 times per week) (1) 2 3 4 5

*** If you strongly disagree with this sentence, you would circle the number 1 ***

Example Question 2:
Do you exercise more than 3 days a week? Yes ☑ No ☐
*** If you exercise more than 3 days a week, you would put a check-mark like this √ in the "Yes" box***

Example Question 3:
For this next question, we would like you to recall your average weekly flexibility activity over the past month.

c. FLEXIBILITY ACTIVITY (e.g., stretching exercises, T'ai Chi, yoga, dance)

Times Per Week	**Average Duration (min.)**
5	20

*** If you engage in flexibility activities 5 days a week for 20 minutes each time, you would fill in a 5 in the first space and a 20 in the second space.

Example Question 4:
These questions ask for your beliefs about endurance, strength, and flexibility activities. Please fill in the number that best fits your answer using the following scale as a numerical yardstick

1	2	3	4	5
strongly disagree	disagree	neutral (neither agree nor disagree)	agree	strongly agree

	Endurance Activities (4-7 times per week)	Strength Activities (2-4 times per week)	Flexibility Activities (4-7 times per week)
Doing these activities would **be smart**	5	5	5

*** If you strongly agree that engaging in these activities would be smart, you would fill in a 5 for all three columns

PART 2: Beliefs and Values About Regular Physical Activity

These questions ask for your beliefs about endurance, strength, and flexibility activities over the next month. Please fill in the number that best fits your answer using the following scale as a numerical yardstick

1	2	3	4	5
strongly disagree	disagree	neutral (neither agree nor disagree)	agree	strongly agree

	Endurance Activities (4-7 times per week)	Strength Activities (2-4 times per week)	Flexibility Activities (4-7 times per week)
Over the next month, doing these activities would:			
1 **be beneficial**	_____	_____	_____
2. **be wise**	_____	_____	_____
3. **be pleasant**	_____	_____	_____
4. **be enjoyable**	_____	_____	_____
5, **make me feel good**	_____	_____	_____
6. **take too much of my free time**	_____	_____	_____
7. **improve my physical appearance**	_____	_____	_____
8. **reduce my chances of getting injured**	_____	_____	_____
9. **improve my social life**	_____	_____	_____
10. **help me control my weight**	_____	_____	_____
11. **get me out of the house on a regular basis**	_____	_____	_____

12. **reduce my chance of chronic disease**_____ _____ _____

13. **help relieve my stress** _____ _____ _____

14. **cause muscle soreness** _____ _____ _____

15. **help me maintain my independence** _____ _____ _____

These questions ask for your values about endurance, strength, and flexibility activities over the next month. Please circle the number that best fits your answer using the following scale as a numerical yardstick

	1 strongly disagree	2 disagree	3 neutral (neither agree nor disagree)	4 agree	5 strongly agree
Over the next month, it is important for me to:					
1. **feel good**	1	2	3	4	5
2. **have free time**	1	2	3	4	5
3. **improve my physical appearance**	1	2	3	4	5
4. **improve my social life**	1	2	3	4	5
5. **control my weight**	1	2	3	4	5
6. **get out of the house on a regular basis**	1	2	3	4	5
7. **reduce my chance of chronic disease**	1	2	3	4	5
8. **relieve my stress**	1	2	3	4	5

9. **avoid muscle soreness**	1	2	3	4	5
10. **reduce my chances of getting injured**	1	2	3	4	5
11. **maintain my independence**	1	2	3	4	5

The next set of questions ask you about what you think other people in your social network think about engaging in endurance, strength, and flexibility activities over the next month. Please fill in the number that best fits your answer using the following numerical scale as a yardstick.

1	2	3	4	5
strongly disagree	disagree	neutral (neither agree nor disagree)	agree	strongly agree

	Endurance Activities (4-7 times per week)	Strength Activities (2-4 times per week)	Flexibility Activities (4-7 times per week)
Over the next month, most people who are important to me:			
1. **will approve of me** engaging in...	_____	_____	_____
2. **will want me to** engage in...	_____	_____	_____
3 **will be** engaging in...	_____	_____	_____
4. **my friends** will approve of me engaging in	_____	_____	_____
5. **my family** will approve of me engaging in	_____	_____	_____
6. **health professionals** will approve of me engaging in	_____	_____	_____
7. **my spouse/ romantic partner** will approve of me engaging in	_____	_____	_____
8. **fitness class instructors** will approve of me engaging in	_____	_____	_____

9 **my workout partner** will approve of me engaging in _____ _____ _____

10. **my friends will be** engaging in _____ _____ _____

11. **my family will be** engaging in _____ _____ _____

12. **health professionals that I know will be** engaging in _____ _____ _____

13. **fitness instructors that I know will be** engaging in... _____ _____ _____

14. **my spouse/ romantic partner will be** engaging in... _____ _____ _____

The next set of questions ask you about the value of importance you place on the engagement in physical activity by others in your social network over the next month. Please circle the number that best fits your answer using the following numerical scale as a yardstick.

1 strongly disagree 2 disagree 3 neutral (neither agree nor disagree) 4 agree 5 strongly agree

Over the next month, it is important for me to:

1 to do what **my family** would want me to do in terms of physical activity 1 2 3 4 5

2. do what **my friends** would want me to do in terms of physical activity 1 2 3 4 5

3. do what **health professionals** would want me to do in terms of physical activity 1 2 3 4 5

4. do what **my spouse/ romantic partner** would want me to do in terms of physical activity 1 2 3 4 5

5. do what **instructors (e.g., coaches, fitness Class instructors)** would want me to do in terms of physical activity 1 2 3 4 5

6 do what **my workout partner** would want me to do in terms of physical activity 1 2 3 4 5

7. I will feel responsible for taking my dog out with me regularly for:
Endurance Activities (4-7 times per week)

0 (I don't have a dog) 1 (strongly disagree) 2 (disagree) 3 (neutral-neither agree nor disagree) 4 (agree) 5 (strongly agree)

PART 3: Barriers and Obstacles to Regular Physical Activity

The following questions concern how much control you believe you have over doing endurance, strength, and flexibility activities over the next month if you were fully motivated to do so. Please circle the number that best fits your answer using the following scale as a numerical yardstick

1 strongly disagree 2 disagree 3 neutral (neither agree nor disagree) 4 agree 5 strongly agree

	Endurance Activities (4-7 times per week)	Strength Activities (2-4 times per week)	Flexibility Activities (4-7 times per week)
Over the next month:			
1. I have control over doing the following activities **if I really wanted to**	_____	_____	_____
2. **if I really wanted to**, doing the following activities would be up to me	_____	_____	_____
3. **if I really wanted to**, I am confident I could do the following activities	_____	_____	_____
4. **despite other time commitments**, if I really wanted to I could do the following activities	_____	_____	_____
5. **despite the financial cost of the activity**, if I really wanted to I could do the following activities:	_____	_____	_____
8. **despite injury/other health issues** if I really wanted to I could do the following activities	_____	_____	_____
7. **despite no access to a gym / recreation center**, if I really wanted to I could do the following activities	_____	_____	_____

8. **despite not having a person to do the activity with**, if I really wanted to I could do the following activities _____ _____ _____

9. **despite bad weather**, if I really wanted to I could do the following activities _____ _____ _____

10. **despite not knowing proper technique** if I really wanted to I could do the following activities _____ _____ _____

11. **despite having no physical chore or task to do**, if I really wanted to I could do the following activities_____ _____ _____

The following questions concern the likelihood of possible barriers getting in the way of you engaging in endurance, strength, and flexibility activities over the next month even if you were fully motivated to do so. Please circle the number that best fits your answer using the following scale as a numerical yardstick

	1 strongly disagree	2 disagree	3 neutral (neither agree nor disagree)	4 agree	5 strongly agree
Over the next month, it is likely that:					
1. I will have free time to engage in physical activity	1	2	3	4	5
2. I will be able to afford the expensive costs associated with physical activity	1	2	3	4	5
3. I will suffer from injury /health issues that will keep me from being physically active	1	2	3	4	5
4 I will have access to a gym or recreation center	1	2	3	4	5
5. there will be an available person for me to be physically active with	1	2	3	4	5
6. the weather will be good enough for me to be physically active	1	2	3	4	5
7. I will know the proper technique involved in physical activities	1	2	3	4	5
8. I will have a physical chore(s) or task(s) to do	1	2	3	4	5

PART 4: Regular Physical Activity Motivation

These questions ask about your plans and intention to do endurance, strength, and flexibility activities over the next month. Please fill in the number that best fits your answer using the following numerical scale as a yardstick.

1	2	3	4	5
strongly disagree	disagree	neutral (neither agree nor disagree)	agree	strongly agree

	Endurance Activities (4-7 times per week)	Strength Activities (2-4 times per week)	Flexibility Activities (4-7 times per week)
1.Over the next month, I am motivated to engage in…	_____	_____	_____
2. Over the next month I intend to engage in…	_____	_____	_____

PART 7: Other health information

In 1998, Health Canada released the "Physical Activity Guide to Healthy Active Living for Adults", and the "Physical Activity Guide to Healthy Active Living for Older Adults".

1. Were you aware of either of these guides prior to this questionnaire being sent to you?

Yes ☐ No ☐ (Please check one)

2. Were you previously aware of Health Canada's recommended amounts of physical activity per week (30-60 minutes of activity at a moderate intensity)? (Please check one)

Yes ☐ No ☐ (Please check one)

3. Were you previously aware of the recommended amounts of the following types of activities?

Strength (4-7 days per week)	Yes ☐ No ☐ (Please check one)
Endurance (2-4 days per week)	Yes ☐ No ☐ (Please check one)
Flexibility (4-7 days per week)	Yes ☐ No ☐ (Please check one)

4. Prior to being sent this questionnaire, had you ever used the guide corresponding to your age (adult guide for those aged 18-64 and older adult guide for those aged 65 years and older)?

Yes ☐ No ☐ (Please check one

5.Have you had a fall in the past 6 months? Yes ☐ No ☐ (Please check one)

***What is meant by a fall? "unintentionally coming to rest on the ground, floor, or other lower levels, whether you were injured by it or not"**

5b If you answered yes to 5a, how many falls have you had in the past 6 months? (Please fill in) _____

5c If you answered yes to 5a, did you sustain any injury that limited your normal functioning for more than 24 hours? Yes ☐ No ☐ (Please check one)

We would like to know a little more about your medical and health background...

6. Has a close blood relative (e.g., a parent, brother or sister) ever had heart disease (e.g., heart attack stroke, and/or angina) before the age of 60?

Yes ☐ No ☐ (Please check one)

7. Has a doctor or nurse ever told you that you have had the following: (*please check all that apply)*

a. Angina	Yes ☐ No ☐
b. Heart Attack	Yes ☐ No ☐
c. Stroke	Yes ☐ No ☐
d. High blood cholesterol	Yes ☐ No ☐
e. High blood pressure	Yes ☐ No ☐
f. Diabetes	Yes ☐ No ☐

If yes, which type? Type 1 ☐ Type 2 ☐ Gestional ☐

PART 8: Demographics

This final part of the questionnaire is needed to help us understand the characteristics of the people participating in the study. All information is held in strict confidence and its presentation to the public will be in the form of group data only.

1. Age **(Please fill-in):** _____
2. Gender: Male ☐ Female ☐ **Please check one**
3. Ethnicity/Race **(Please fill-in):** _____
4. What is the highest level of education that you completed? **Please check only one.**

☐ 8th grade or less
☐Vocational school or some college
☐ Some high school
☐ College degree
☐ High school diploma
☐ Professional or graduate degree

5. What is your current marital status? **Please check only one.**

☐ Never married
☐ Married/common law
☐Separated /divorced /widowed

6. How about your job situation? **Please check one that fits you best.**

☐ Homemaker
☐ Retired
☐Paid full-time employment
☐ Paid part-time employment
☐ Temporarily unemployed

7.What is your annual family income? **Please check only one**

☐ $5001 to $10,000
☐ $10,001 to $20,000
☐ $20,001 to $40,000
☐ $40,001 to $75,000
☐ More than $75,000

8. Height (Please fill-in): _____feet _____inches or _____ metres_____centimetres **(Please fill in):**

Weight (Please fill-in): _____pounds or _____kilograms **(Please fill-in):**

9. Postal Code (Please fill-in): _____**(Please fill-in):**

In one month's time, we will be contacting you again in order to send you a brief follow-up questionnaire. This questionnaire should take no more than 5 minutes to complete.

Thank you for taking the time to complete this questionnaire. Your help is greatly appreciated

Appendix H: One-Month Follow-Up Questionnaire Sent to Experimental Group

University of Victoria

Behavioural Medicine Laboratory UVic

Physical Activity in the Greater Victoria Area

One Month Follow-Up

Aviva Kliman – University of Victoria, Masters Candidate
Supervisor: Dr. Ryan Rhodes – University of Victoria

Thank you for having taken the time to complete our first questionnaire last month. We really appreciate it. Here is a brief one-month follow-up questionnaire for you to complete about your physical activity frequency and intentions.

Instructions

If you decide to complete this one-month follow-up, please sign the enclosed participant consent form, and then answer the questions to the best of your knowledge. If you choose not to answer any question, just leave it blank and move to the next question. We need the most complete information possible to include your input in our results. When you are through, please place the questionnaire and your signed consent form into the pre-paid self-addressed envelope and place it in the mail.

This is the last time we will be contacting you. Thank you again for participating in our study and we look forward to your input!

Once again, please note that your name and address were selected completely at random from the Greater Victoria Area telephone book, and that we do not possess any other personal information about you.

If you have any questions about completing the questionnaire, please call

Aviva Kliman (250) 721-8384 or Ryan Rhodes (250) 721-8384

Part 1

For this question, we would like you to recall your average weekly endurance, strength, and flexibility activity over the past month.

When answering these questions please:

- consider your average weekly activity over the past month.
- note that the main difference between the three categories is the intensity of the activity.
- please write the average frequency on the first line and the average duration on the second line.

a. ENDURANCE ACTIVITY
(e.g., brisk walking or running, golfing (without a ride-on cart), yard and garden work, cycling, skating, continuous swimming, tennis, dancing)

	Times Per Week	Average Duration (min.)
Strenuous Intensity (HEART BEATS RAPIDLY, SWEATING)	_____	_____
Moderate Intensity (NOT EXHAUSTING, LIGHT PERSPIRATION)	_____	_____
Mild Intensity (MINIMAL EFFORT, NO PERSPIRATION)	_____	_____

b. STRENGTH ACTIVITY
(e.g., heavy yard work, such as cutting and piling wood, raking and carrying leaves, exercises like abdominal curls and push-ups, weight/strength-training routines)

Times Per Week	Average Duration (min.)
_____	_____

c. FLEXIBILITY ACTIVITY
(e.g., stretching exercises, T'ai Chi, yoga, dance)

Times Per Week	Average Duration (min.)
_____	_____

Please continue on to the next page to complete part 2 of this follow-up questionnaire

Part 2

These questions ask about your plans and intention to do endurance, strength, and flexibility activities over the next month. Using the following numerical scale as a yardstick, **please fill in** the number that best fits your answer

1	2	3	4	5
strongly disagree	disagree	neutral (neither agree nor disagree)	agree	strongly agree

	Endurance Activities (4-7 times per week)	Strength Activities (2-4 times per week)	Flexibility Activities (4-7 times per week)
1. Over the next month **I am motivated** to engage in…	_____	_____	_____
2. Over the next month **I intend** to engage in…	_____	_____	_____

Part 3

1. Please rate your overall use of Health Canada's Physical Activity Guide over the past month **(Please check one)**

- ☐ I did not have the chance to look through it
- ☐ I gave it a brief look
- ☐ I gave it a thorough read
- ☐ I gave it a thorough read, and continue to use it

2. If you had the chance to read the guide, how would you rate its overall quality **(Please check one)**

- ☐ very good
- ☐ good
- ☐ satisfactory
- ☐ poor
- ☐ very poor

3. If you had the chance to read the guide, did you feel that the information it contained was useful? **(Please check one)**

- ☐ The information was very useful
- ☐ The information was somewhat useful
- ☐ The information was not useful at all

4. Please feel free to make any additional comments that you have surrounding Health Canada's Physical Activity Guide i.e.: likes, dislikes, suggested improvements...

_____
_____
_____
_____
_____
_____
_____
_____

THANK YOU FOR TAKING THE TIME TO COMPLETE THIS FOLLOW-UP QUESTIONNAIRE. YOUR HELP IS GREATLY APPRECIATED!!

Appendix I: One-Month Follow-Up Questionnaire Sent to Control Group

University of Victoria

Behavioural Medicine Laboratory UVic

Physical Activity in the Greater Victoria Area

One Month Follow-Up

Aviva Kliman – University of Victoria, Masters Candidate
Supervisor: Dr. Ryan Rhodes – University of Victoria

Thank you for having taken the time to complete our first questionnaire last month. We really appreciate it. Here is a brief one-month follow-up questionnaire for you to complete about your physical activity frequency and intentions.

Instructions

If you decide to complete this one-month follow-up, please sign the enclosed participant consent form, and then answer the questions to the best of your knowledge. If you choose not to answer any question, just leave it blank and move to the next question. We need the most complete information possible to include your input in our results. When you are through, please place the questionnaire and your signed consent form into the pre-paid self-addressed envelope and place it in the mail.

This is the last time we will be contacting you. Thank you again for participating in our study and we look forward to your input!

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Aviva Kliman (250) 721-8384 or Ryan Rhodes (250) 721-8384

Part 1

For this question, we would like you to recall your average weekly endurance, strength, and flexibility activity over the past month.

When answering these questions please:

- consider your average weekly activity over the past month.
- note that the main difference between the three categories is the intensity of the activity.
- please write the average frequency on the first line and the average duration on the second line.

a. ENDURANCE ACTIVITY

(e.g., brisk walking or running, golfing (without a ride-on cart), yard and garden work, cycling, skating, continuous swimming, tennis, dancing)

	Times Per Week	Average Duration (min.)
Strenuous Intensity (HEART BEATS RAPIDLY, SWEATING)	_____	_____
Moderate Intensity (NOT EXHAUSTING, LIGHT PERSPIRATION)	_____	_____
Mild Intensity (MINIMAL EFFORT, NO PERSPIRATION)	_____	_____

b. STRENGTH ACTIVITY

(e.g., heavy yard work, such as cutting and piling wood, raking and carrying leaves, exercises like abdominal curls and push-ups, weight/strength-training routines)

Times Per Week	Average Duration (min.)
_____	_____

c. FLEXIBILITY ACTIVITY

(e.g., stretching exercises, T'ai Chi, yoga, dance)

Times Per Week	Average Duration (min.)
_____	_____

Please continue on to the next page to complete part 2 of this follow-up questionnaire

Part 2

These questions ask about your plans and intention to do endurance, strength, and flexibility activities over the next month. Using the following numerical scale as a yardstick, **please fill in** the number that best fits your answer

1	2	3	4	5
strongly disagree	disagree	neutral (neither agree nor disagree)	agree	strongly agree

Endurance Activities (4-7 times per week)	Strength Activities (2-4 times per week)	Flexibility Activities (4-7 times per week)

1. Over the next month **I am motivated** to engage in...

_____ _____ _____

2. Over the next month **I intend** to engage in...

_____ _____ _____

THANK YOU FOR TAKING THE TIME TO COMPLETE THIS FOLLOW-UP QUESTIONNAIRE. YOUR HELP IS GREATLY APPRECIATED!!