Elderly Tomboys? Sources of Self-Efficacy for Physical Activity in Late Life

Sandra O’Brien Cousins

Little research has attended to the possibility that competencies and efficacy for physical activity acquired in childhood may last a lifetime. This study examined self-report and recall data on 327 Vancouver women born between 1896 and 1921 with a view to understanding current sources of self-efficacy for adult fitness activity. Current self-efficacy (SE) for late life fitness activity was assessed alongside age, education, perceived well-being, and movement confidence in childhood (MCC) for six challenging physical skills. Perceived well-being was the best predictor of late life SE for fitness exercise, explaining 26% of the variance. However, MCC was also an equally important and independent predictor of late life SE, even when age, education, and perceived well-being were controlled for. This study provides preliminary evidence that personal estimates of ability to exercise in late life are based on self-evaluations of wellness, current age, and former competencies that have origins in girlhood mastery experiences over six decades earlier.

Key Words: elderly, women, efficacy, school curriculum, childhood development

Scientific support is building for the hypothesis that lifelong patterns of sedentary living have both profound and negative effects on late life health. Insufficient participation in regular, moderate exercise is known to shorten the life span, increase morbidity, and undermine quality of life, general well-being, and prospects for independent living (Bouchard, Shephard, & Stephens, 1994). The known benefits of regular physical activity are of such a magnitude that exercise has been portrayed as a “survival resource” (O’Brien & Vertinsky, 1991) and a “fountain of youth” for aging adults (Ontario Worker’s Compensation, 1993). Yet, only 30% of elderly women engage in activity at levels likely to improve their health (Stephens & Craig, 1990). By age 85, over half of all women are institutionalized because they are too weak, too stiff, and too frail to conduct simple activities of daily living.

Explanations for women’s reluctance to avoid this physical predicament are lacking. Some studies blame older women’s lack of involvement and motivation on age stereotypes, historical exclusion from sport, and negative attitudes toward and about athletic women (Vertinsky, 1995). Other research claims that attitudes and

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self-motivation in the exercise setting (e.g., cardiac rehabilitation) are not any
different for elderly adults (Rhodes, Morrissey, & Ward, 1992) or for elderly
women (Lee, 1993) than for males or younger adults. Rather, lower levels of
vigorous physical activity combined with a longer life span may be key reasons why
older women, more than older men, are likely to encounter years of frailty, balance
difficulties, osteoporosis, hypertension, and insufficient strength to sustain an
independent lifestyle (Verbrugge & Wingard, 1987).

Sport socialization research suggests that adult participation is influenced by
early life experiences, childhood encouragement, family activity patterns, lifestyle
continuity, and youth, varsity, and organized sport participation (Greendorfer,
1983; Howell & McKenzie, 1987; Perusse, LeBlanc, & Bouchard, 1988; Snyder
study by Espenschade (1969) on women 35 to 80 years of age is the only one to
mention that female physical education majors, classes 1913 to 1953, were signifi-
cantly different from inactive controls in their belief that they were highly active in
childhood and in the belief that they were considered to be “tomboys” (p. 89).

Despite the research support for connections between early life involvement
and adult life participation, some debate still exists whether childhood participation
is really a precursor to adult physical activity (Powell & Dysinger, 1987). Evidence
exists that youth sport participation for females does not necessarily have the same
value (Greendorfer & Lewko, 1978) or carryover into adulthood as it does for men
(Howell & McKenzie, 1987; Spreitzer & Snyder, 1983). Confounding elements
such as education, real or perceived health status, and social interpretations of age,
combined with the unaccounted experiences of early 20th century school curricula
in sports and physical education, undermine the current knowledge base (O'Brien
Cousins & Vertinsky, 1995). One point is certain: The possible mechanisms of
continuity that would link late life physical activity to experiences and opportunities
available five or six decades earlier have received little discussion.

Of interest to this issue are formal interviews with older women about their
motivation to exercise; qualitative data point to the power of self-referent beliefs
about capability and confidence to engage in more vigorous forms of exercise
(O'Brien Cousins & Vertinsky, 1995). For example, older women who reported
confidence to try new physical activities such as gymnastics or tai chi claimed they
felt quite capable because they recalled being able to climb trees as well as, or better
than, other children in their girlhood. In previous research exploring girlhood play
patterns and physical activity, more than a few of the active women spontaneously
explained that they were “tomboys” during their girlhood (O'Brien Cousins, 1993).
This qualitative support for lifelong feelings of physical competency spurs further
research. If expectancy and beliefs about competence or inadequacy in the exercise
setting stem from girlhood experiences in play and sport, and these beliefs withstand
the test of time over the middle years of life, then the benefits of skill-enhancing and
enjoyable physical activity opportunities for girls in schools and community
programs can last a lifetime.

Important theoretical support for the explanation of late life behavior, beliefs
about physical competence, and relationships to past mastery experiences comes
from Bandura's social cognitive theory and the construct of self-efficacy (Bandura,
1989). Beginning with White (1959), several investigators have argued that ability
attributions and perceived competence play the central role in mediating motivation
and behavior (Bandura, 1977; Harter, 1981), especially as it pertains to physical activity (McAuley, 1992; Roberts, Kleiber, & Duda, 1981) and older adult physical activity (Dzewaltowski, 1989; O’Brien Cousins, 1993).

Self-efficacy has been found to be the most powerful and statistically significant correlate of both walking and vigorous exercise among ill and healthy groups alike (Hofstetter et al., 1991). Dzewaltowski (1989) concluded that “those who exercise are confident that they can exercise despite uncontrollable factors” (p. 266). Self-efficacy in 50- to 64-year-old men and women was significantly associated with exercise adherence at both 6 months and 1 year (r = .42 and .44, respectively) (Garcia & King, 1991). McAuley (1992) found that for 45- to 64-year-old adults, self-efficacy cognitions predicted adoption of exercise behavior but previous exercise behavior was the strongest predictor of subsequent participation. While other work specifically supports the finding that self-efficacy for fitness activities is a key predictor of late life exercise among women (O’Brien Cousins, 1993), the sources of this efficacy are unknown.

Increasing physical activity in late life (such as joining an exercise class) represents a new and challenging performance setting for an older adult. Bandura confirmed that

> when initially faced with managing a complex unfamiliar environment, people relied heavily on their past performance in judging their efficacy and setting their personal goals. (1992, p. 15)

Therefore, beliefs about one’s physical competency must be strong and lasting if one is to overcome obstacles to initiating and sustaining participation. Since self-doubts can set in fast after some failures or reversals in performance, people must have a robust sense of self-efficacy to sustain the effort needed to succeed. Bandura noted that

> because the acquisition of knowledge and competencies usually requires sustained effort in the face of difficulties and setbacks, it is resiliency of self-belief that counts. (1992, p. 22)

There remains the need to clarify the sources of self-beliefs regarding physical capability. It would be helpful to know if physical efficacy (or movement confidence) forms early in life and is resilient over the lifespan.

Despite increasing support for the efficacy construct, older adults have not been the target of much research. Moreover, there is little evidence that specific physical competencies learned in childhood provide lifelong efficacy and incentives for adherence to healthful levels of physical activity decades later. If self-estimates of capability for exercise are so critical to the participation of aging adults, two questions arise: What are the sources of late life efficacy for exercise? Does late life efficacy for physical activity originate in childhood? The purpose of this study was to examine the relationship of recalled childhood movement competencies with current self-efficacy for late life fitness activities in women. Given that physical efficacy is often influenced by personal attributes such as age, education, and general well-being, these factors need to be concurrently examined. Thus, this study aimed to explore the roles that age, education, beliefs about one’s health capability,
and beliefs about childhood capability for physical activity would play in explaining self-efficacy for late life physical fitness activity.

The present study extends previous theoretical research that examined 10 personal attributes and six cognitive beliefs as possible determinants of late life exercise among women over age 70 (O'Brien Cousins, 1993, 1995a). In that study, cognitive beliefs were more powerful explanations than were personal attributes; beliefs about efficacy for exercise and beliefs about social support (encouragement) emerged as strong independent predictors of late life exercise in women over age 70, explaining 22% of the variability in weekly exercise, \( F(6, 136) = 7.169, p < .01 \). During the early stages of regression analysis, it became clear that the measure of childhood movement confidence could not compete in the regression equation alongside the current efficacy for fitness exercise. The strong relationship between the two different ability measures prompted further exploration in the current study.

Methods

SAMPLING STRATEGY

The goal of this study was to explore sources of physical efficacy beliefs of older women who were independently living and who were physically and socially capable enough to spend their leisure time in community settings. In metropolitan Vancouver, 69 community facilities offered programs, social activities, clubs, and meetings for seniors. A city map was used to define 18 geographic clusters, each with three to four facilities in a 1- to 4-mile area. Randomized sampling was used to select one research site from each of the 18 clusters. Following a phone call to each site, a letter of permission to conduct the study was obtained from the management of each participating facility. Census sampling was conducted with all seniors' programs offered at each location. Women over the age of 70 were asked to volunteer by filling out a questionnaire. Some women filled out surveys at the time of the visit, but most of the women completed the surveys at home and returned them to a collection box at the program facility. In this way, a city-wide sample of 327 Vancouver women aged 70 to 98 years filled out survey questionnaires, providing detailed information on personal attributes and beliefs about exercise.

Of interest to the current study were age (birth year), education, perceived well-being, self-ratings of competence and experience with childhood physical skills, and ratings of self-efficacy for current fitness exercise. The subjects' cognitive abilities were not directly assessed, but surveys were discarded when data were seriously lacking or when an individual had obvious problems comprehending and completing the survey.

INSTRUMENTS

Basic demographic data such as age and education were obtained using reported
birth year and eight categories of education (ranging from "no schooling" to
"university/college degree"). Health status was assessed with the 14-item Perceived
Well-Being Scale (PWB) of Reker and Wong (1984). The scale represents both
psychological well-being (6 items) and physical well-being (8 items) by scoring
statements such as, "I feel that life is worth living" and "I am in good shape
physically.” With a 7-point Likert-type scale, from strongly agree to strongly disagree, scores could range from 14 to 98. Internal consistency of the overall well-being index reached .91. Concurrent validity of PWB scores with the MUNSH Happiness Scale (Kosma & Stones, 1980) was $r = .70, p < .0001$; with psychological well-being and the Beck Depression Scale (Beck, 1967), $r = -.55, p < .001$; and with physical well-being and physical symptoms, $r = -.40, p < .001$. Reker and Wong (1984) reported significant discriminant validity of the scale to differentiate between an elderly community sample and an elderly institutionalized sample; 4-week test–retest reliability among older women was .60.

Movement confidence in childhood (MCC) was assessed using an adapted version of Griffin and Crawford’s (1989) validated Stunt Movement Confidence Inventory (SMCI), which combines estimates of sureness about being able to perform specific physical skills along with an estimate of practice or experience. A strong feature of the SMCI is illustrations specifying the exact nature of the physical activities to be used to guide accurate self-appraisals of efficacy and past mastery. However, adaptation of the activities illustrated on the SMCI was necessary, since the original 6-item scale depicted “stick men” skateboarding and dirt-biking over hilly terrain—stunts that would have been unavailable to girls at the turn of the century. I retained the rope climb and hang from the knees and added four other activities that older women had identified in personal interviews as being challenging physical activities in their girlhood: diving into deep water, jumping from a high object, doing the splits, and riding a two-wheel bicycle (see Figure 1). The six girlhood activities were based on interview data conducted in a pilot study with older women about their childhood activities, and the skills were specifically chosen for their physical challenge and ease of recall. It is unlikely that older women would forget whether they had ever learned to ride a two-wheel bicycle or been able to dive (and thus swim) in deep water. Furthermore, these activities represented a wide range of physical abilities: inversion, land and aquatic ability, flexibility, endurance, balance, and arm, trunk, and leg strength.

Scoring for the MCC scale consisted of summing the scores for the six activities in each scale from the responses to the questions “How sure are you that you could have done this as a youth?” and “How many times would you have done this in your youth?” Four-point Likert-type scales were provided, from very sure (4) to I know I couldn’t (1), and from I have done this a lot (4) to I’ve never done this (1), respectively. Sums of scores for the six skills ranged from 6 to 24 for each of the two questions, which were then summed and averaged.

Self-efficacy for fitness exercise (SE) was a prospective estimate of ability for six specified fitness exercises as depicted in Figure 2 (10 curl-ups, 5 modified push-ups, a 50-min aquatic exercise class, a 20-min brisk walk, a slow stretch to touch the toes, and 20 min of cycling). These fitness activities were selected as among the more challenging from those observed in contemporary exercise programs attended by older women in metropolitan Vancouver. As with the MCC scale, the fitness activities represented a range of physical challenges for older women, including hip flexibility, aerobic fitness, and arm, leg, and trunk strength. Scoring for the SE scale was calculated in the same manner as the MCC scale but only for responses to the question “How sure are you that you can do this?” A 4-point Likert-type scale was provided from very sure (4) to I know I couldn’t (1), with scores potentially ranging from 6 to 24.
Figure 1. The six girlhood skills illustrated in the MCC scale.

Figure 2. The six late life fitness exercises in the self-efficacy scale.
The MCC and SE instruments were pilot tested for 4-week reproducibility with 17 older women between 55 and 75 years of age and were found to be highly reliable for movement confidence as a child \( r = .951, p < .0001 \) and late life self-efficacy \( r = .779, p < .001 \). The superior test–retest reliability of the childhood movement confidence measure supports the idea that beliefs about adult competence and ability are vulnerable to fluctuations as people experience contemporary life, while MCC scores are quite stable reflections of the past.

SYSTAT 5.01 software was used to conduct the statistical analyses. All variables were standardized in preparation for simple multiple-regression analysis, which was used to examine the ability of MCC along with age, education, and perceived well-being to independently predict the criterion variable, self-efficacy for fitness activity.

### Results

**DESCRIPTIVE FINDINGS**

Table 1 contains the descriptive statistics for the study variables. The oldest woman was born in 1896. With an average age of 77, the 327 women demonstrated substantial heterogeneity in all the variables. Subjects in this sample appeared to be better educated and in better subjective health than Canadian demographic norms for this age and gender (Statistics Canada, 1990). The majority of the women had completed high school (70%), and one third of the sample had gone on to university. Another 20% had taken vocational training such as nursing or business school. In terms of perceived well-being scores \( 77.34 \pm 4.71 \), the women rated themselves slightly better than Reker and Wong’s (1984) community sample of elderly, who scored 75.9 \pm 8.4, and better than their group of institutionalized elderly, who scored 65.7 \pm 12.4.

The weekly activity patterns of the elderly women in this study were highly variable and are reported in more detail elsewhere (O’Brien Cousins, 1995b). In the week reported, the women spent on average 5.8 hr being physically active, but the scores ranged from 0 to 41 hr of activity. Overall, the average total kilocalories per week reported on leisure-time physical activity was 1,500 \pm 1,200. About half of the

<table>
<thead>
<tr>
<th>Table 1</th>
<th>Ranges, Means, and Standard Deviations of the Study Variables</th>
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<tbody>
<tr>
<td></td>
<td>( N )</td>
</tr>
<tr>
<td>Age (years)</td>
<td>318</td>
</tr>
<tr>
<td>Education (category)</td>
<td>324</td>
</tr>
<tr>
<td>Total PWB</td>
<td>313</td>
</tr>
<tr>
<td>PWBPsych</td>
<td>315</td>
</tr>
<tr>
<td>PWBPhys</td>
<td>313</td>
</tr>
<tr>
<td>SE</td>
<td>293</td>
</tr>
<tr>
<td>MCC</td>
<td>322</td>
</tr>
</tbody>
</table>

*Note. PWB = Perceived Well-Being Scale; SE = self-efficacy; MCC = movement confidence in childhood.*
women in the study reported activity levels below 1,000 kcal per week, an amount thought to be inadequate for adult health and fitness (Paffenbarger et al., 1986).

Descriptive analysis of the six girlhood skills indicated that the majority of women were very sure they couldn't do the rope climb (Figure 3), the deep water dive (Figure 4), and the splits as young girls (Figure 5). Almost half of the women were very sure they could, and did, hang and swing by their knees (Figure 6) and ride a two-wheel bicycle as youngsters (Figure 7).

Figure 3. Self-efficacy for arm strength as a girl and as an older adult.

Figure 4. Self-efficacy for aquatic activity as a girl and as an older adult.
Figure 5. Self-efficacy for hip flexibility as a girl and as an older adult.

Figure 6. Self-efficacy for trunk strength as a girl and as an older adult.

Descriptive analysis\(^1\) of efficacy scores for the six adult fitness activities indicated that older women felt most confident about performing the brisk 20-min walk (75% were very sure or pretty sure) (Figure 8) and the slow sitting toe touch (65% were very sure or pretty sure) (Figure 5). About 70% of the women were not

\(^1\)Previously published in O’Brien Cousins (1995a).
very sure about or knew they couldn’t do the push-up from the knees five times (Figure 3). Similarly, performing the curl-up 10 times was ranked with low confidence by over 60% of the women (Figure 6).

A comparison of the paired girlhood and late life efficacy scores reveals that the ratings were not completely congruent across all youth skills and adult fitness activities. However, low efficacy scores were very congruent for past and present arm strength, trunk strength, and aquatic activity pairs.
STATISTICAL FINDINGS

Table 2 shows Spearman correlations among the variables. Perceived well-being showed the strongest association with late life SE, an indicator that subjective health is very important to an individual’s sense of capability for vigorous activity (Table 2). MCC correlated significantly with adult efficacy for fitness exercise ($r = .44$, $p < .0001$). Age was also a factor in efficacy estimates, with older women demonstrating lower levels of self-efficacy for fitness activity. Education was significantly related to MCC, but not SE, so it was not included in the regression equation.

Multiple-regression analysis, with listwise deletion of cases with missing data, forced the remaining three independent variables into the equation (see Table 3). Even when competing with each other, PWB, age, and MCC were all significant

### Table 2  Spearman Correlation Matrix of the Explanatory Variables Using Pairwise Deletion

<table>
<thead>
<tr>
<th></th>
<th>SE</th>
<th>MCC</th>
<th>Age</th>
<th>PWB</th>
<th>Education</th>
</tr>
</thead>
<tbody>
<tr>
<td>SE</td>
<td>1.00</td>
<td>.463*</td>
<td>.223*</td>
<td>.538*</td>
<td>.167</td>
</tr>
<tr>
<td>MCC</td>
<td>.463*</td>
<td>1.00</td>
<td>.223*</td>
<td>.118</td>
<td>.067</td>
</tr>
<tr>
<td>Age</td>
<td>.223*</td>
<td>.223*</td>
<td>1.00</td>
<td></td>
<td></td>
</tr>
<tr>
<td>PWB</td>
<td>.538*</td>
<td>.118</td>
<td></td>
<td>1.00</td>
<td></td>
</tr>
<tr>
<td>Education</td>
<td>.167</td>
<td>.069</td>
<td>.067</td>
<td></td>
<td>1.00</td>
</tr>
</tbody>
</table>

*Note. SE = self-efficacy; MCC = movement confidence in childhood; PWB = perceived well-being.  
*p < .05

### Table 3  Unstandardized Regression Coefficients and Standardized Errors for the Regression of Late Life Self-Efficacy on the Explanatory Variables

<table>
<thead>
<tr>
<th>Exploratory variables</th>
<th>Full model (N = 266)</th>
<th>Reduced model (N = 266)</th>
</tr>
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<tbody>
<tr>
<td></td>
<td>$\beta$</td>
<td>$SE$</td>
</tr>
<tr>
<td>Age</td>
<td>-.033*</td>
<td>.009</td>
</tr>
<tr>
<td>Education</td>
<td>.068</td>
<td>.049</td>
</tr>
<tr>
<td>Perceived well-being</td>
<td>.386*</td>
<td>.047</td>
</tr>
<tr>
<td>MCC</td>
<td>.324*</td>
<td>.052</td>
</tr>
<tr>
<td>$R^2$</td>
<td>.407</td>
<td>.412</td>
</tr>
<tr>
<td>Adjusted $R^2$</td>
<td>.403</td>
<td>.405</td>
</tr>
<tr>
<td>$R$</td>
<td>.638</td>
<td>.760</td>
</tr>
</tbody>
</table>

*Note. MCC = movement confidence in childhood.  
*p < .0001.
predictors of SE for fitness activities. On their own, MCC explained 21.6%, age explained 10.4%, and PWB explained 25.5% of the SE variance. In combination, they explained 40.5% of the total variance seen in self-efficacy. Explaining this amount of variance in human psychological and behavioral constructs is considered to be a very good fit of the data.

**Discussion**

Although aging is considered to be "a lifelong process in which events, experiences, beliefs, values and roles at one stage may influence those that occur later" (McPherson, 1994, p. 331), little attention has been given to the life span processes that lead to strong self-perceptions of physical efficacy in late life. This study provides preliminary evidence that late life efficacy for challenging forms of exercise is significantly related to recollections of girlhood movement capabilities over six decades earlier. These findings suggest that childhood competencies act as mastery experiences that may be viewed as one source of late life efficacy information. Because social cognitive theory holds that self-efficacy is situation specific, the issue raised is whether the characteristics of fitness activity in late life are comparable to, and generalized from, experiences of girlhood athleticism.

Although the retrospective nature of this study and the subjective assessments given by very elderly women give cause for some concern, human behavior is based on self-referent beliefs and perceptions and not the validity of those beliefs and perceptions. Indeed, reminiscence studies support the persistence and relevance of early memories. Therefore, even if the recall of one's physical capabilities 60 to 80 years ago is subject to memory losses, these faults add error to the recall data; such errors weaken rather than strengthen statistical relationships.

This study aimed to answer two questions: What are the sources of late life efficacy for exercise? Does late life efficacy for physical activity originate in childhood? Recognizing the limitations of self-report in very elderly adults and the possible limitations of human memory in recollection situations, this study examined four explanations for late life self-efficacy. Elderly women's perceptions about physical and psychological well-being were the most important explanations for expectations about their ability to undertake fitness exercise in late life. Perceived well-being accounted for 26% of the variance in self-efficacy scores. However, movement confidence in childhood was also a strong and independent predictor, explaining almost 22% of self-efficacy variance. In total, over 40% of the variance in self-efficacy beliefs of elderly women was explained by perceived well-being, girlhood movement confidence, and age. Education was dropped as a predictor of self-efficacy since it shared common variance with movement confidence in childhood.

Socioeconomic status or income level is reported as a factor in explaining health behaviors and physical activity (Wister, 1996). But recent work examining socioeconomic factors and late life exercise among women suggests that, by old age, economic indexes do not necessarily add explanation since they have overlapping variance with education, marital status, gender, and work status (O'Brien Cousins, 1995b). Income factors, which are good predictors of behavior in younger adults, are apparently leveled in the later years by universal pensions bolstered by old age and widow supplements. Thus, socioeconomic status was not examined in this study.
This study found that older women judge their efficacy for exercise based on their understanding of their ability as defined by perceived health, chronological age, and previous skills. Since natural age declines are a physiological fact at this life stage, age and subjective well-being are perhaps unalterable reflections of an old woman’s reality. On the other hand, another part of her identity relating to her physical capability in late life appears to be subjectively linked to her competencies and vitality as a young girl. This study provides some preliminary support that either (a) beliefs about physical self-efficacy for sport and exercise are generalized in one’s physical identity over a lifetime, or (b) early mastery experiences in physical skill are simply an important source of information for judging one’s physical capability when there are few other experiences on which to draw in late life. Ironically, these same women who ignored, or perhaps enjoyed, the tomboy identity as young girls appear to have maintained a resilient optimism over the remaining life course about their physical capabilities. Now, six or more decades later, these turn-of-the-century tomboys believe that they are still quite capable of succeeding at the more challenging fitness activities available to them.

Other research is needed to tease out how activity patterns ebb and flow according to life stage. Certainly, some previously sedentary adults have been known to initiate and maintain fitness programs in very late life, while other people who were once very athletic succumb to sedentary patterns by old age (O’Brien & Vertinsky, 1991). Longitudinal studies will eventually solve the mystery of why some formerly active people stop activity by late life, and why others who never have been very active become converts to physical activity in their older years. In the short term, the most practical step will be to undertake qualitative interviews that retrospectively document individual activity patterns and the explanations of those patterns.

References


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