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Attitudes and Beliefs That Predict Older People's Intention to Undertake Strength and Balance Training

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Many older people refuse to participate in programs of strength and balance training (SBT), limiting their effectiveness for falls prevention. To persuade older people to take up SBT, we need to know whether their intention to undertake SBT is motivated by the perceived threat of falling or the perceived suitability and benefits of SBT. A survey of 558 people aged 60 to 95 years assessed intention to undertake SBT, as well as measures of threat appraisal (concern about falling, perceived risk, and consequences of falling) and coping appraisal (perceived benefits and appropriateness for them of undertaking SBT). Intention to undertake SBT was much more closely related to all elements of coping appraisal than to threat appraisal. The elements of coping appraisal included the belief that it has multiple benefits and is associated with a positive social identity, and the feeling that family, friends, and doctors would approve of taking part.

FALLS are the most common cause of unintentional injury among older people, as around one third of community dwellers aged over 65 fall each year (American Geriatrics Society, British Geriatrics Society, & American Academy of Orthopaedic Surgeons Panel on Falls Prevention, 2001). Falls and fear of falling can lead to distress, restricted mobility, and loss of independence, which in turn result in social isolation and increased utilization of health and social services (Bruce, Devine, & Prince, 2002; Cumming, Salkeld, Thomas, & Szonyi, 2000; Delbaere, Crombez, Vanderstraeten, Willems, & Cambier, 2004; Li, Fisher, Harmer, McAuley, & Wilson, 2003; Murphy, Williams, & Gill, 2002; Yardley & Smith, 2003).

Clinical trials have demonstrated that the risk of falling and the fear of falling can be reduced by the performance of activities that incorporate strength and balance training (SBT), that is, by the performance of exercises to increase muscle strength in the legs and improve postural control (American Geriatrics Society et al., 2001; Chang et al., 2004; Gillespie et al., 2001; Liu-Ambrose, Khan, Eng, Lord, & McKay, 2004; Sattin, Easley, Wolf, Chen, & Kutner, 2005; Skelton & Todd, 2004). Despite the proven efficacy of SBT, prevention programs based on SBT can only be effective at a population level if participation rates are high (van Haastregt, Diederiks, van Rossum, de Witte, & Crebolder, 2000). Currently, older people often enter falling prevention programs only *after* they have incurred a fall-related injury, by which time it may be too late to avoid serious consequences such as prolonged or permanent loss of function (Todd et al., 1995). Over half of those individuals offered the opportunity to take part in SBT programs generally refuse (Campbell et al., 1997; Robertson, Devlin, Gardner, & Campbell, 2001; Stevens, Holman, Bennett, & de Klerk, 2001), and observed rates of uptake are sometimes less than 10% (Day et al., 2002; Fabacher et al., 1994).

To date there has been limited research on older people's views of SBT, and the reasons why they do or do not wish to undertake exercises to reduce their risk of falling. Qualitative studies have provided some insights into what factors may be relevant (McInnes & Askie, 2004). It appears that few older people are actually aware of the potential of SBT exercises to reduce falling risk, and most assume that falls prevention entails restricting activity and using aids, which they are often reluctant to do (Commonwealth Department of Health and Aged Care, 2001; Simpson, Darwin, & Marsh, 2003; Yardley, Donovan-Hall, Francis, & Todd, 2006). Older people may resist advice to undertake falls prevention measures because the idea that they are at an increased risk of falling is incompatible with their self-image as capable and independent (Health Education Board for Scotland, 2003; Yardley, Donovan-Hall et al.). It has therefore been suggested that older people may respond more positively to health promotion messages about healthy aging and independence than to warnings about falling risk and injury (Health Education Board for Scotland; Minichiello, Browne, & Kendig, 2000; Yardley, Donovan-Hall et al.). It would be quite possible to present SBT primarily as a means of maintaining function, because SBT has the potential to improve physical functioning and mobility as well as reduce falls risk (Campbell et al., 1997; Li et al., 2003; Nelson et al., 2004). However, if concern about the risk of falling is an important motivation to undertake falls prevention, it may be necessary to try to overcome denial of personal risk in order to persuade people of their need to carry out SBT (Commonwealth Department of Health and Aged Care; McInnes & Askie; Yardley, Donovan-Hall et al.). Quantitative research could determine whether the perceived risk of falling is indeed associated with increased intention to undertake SBT.

Protection motivation theory provides a useful framework for identifying the components of a perceived threat to health that have proved relevant to preventive health behavior (Milne, Sheeran, & Orbell, 2000; Rogers, 1983; Ruiter, Abraham, & Kork, 2001; Witte & Allen, 2000). Protection motivation theory proposes that our appraisal of a threat to health is based on our evaluation of the severity of the threat, our perceived vulnerability to the threat, and our emotional fear of the threat. The intention to undertake preventive action is partly determined by

this threat appraisal, but it is also influenced by a coping appraisal that is based on our evaluation of the efficacy and costs of the preventive behavior, and our confidence that we can perform it (self-efficacy). Appraisal of the preventive behavior should be more salient if the threat appraisal suggests that preventive action is necessary, and so an interaction between coping and threat appraisal has been proposed (Rogers; Witte & Allen). However, there is currently more consistent evidence for independent than interactive effects of threat and coping appraisal (Maddux & Rogers, 1983; Milne et al.; Ruiter et al.; Witte & Allen).

Another theoretical framework, the theory of planned behavior (Ajzen, 2001), is very widely used to measure the relevant components of appraisals of health-related behaviors (Godin & Kok, 1996), including carrying out exercise (Hagger, Chatzisarantis, & Biddle, 2002). According to the theory of planned behavior, the intention to perform a behavior is determined by attitude (which is based on an evaluation of the positive and negative consequences of performing the behavior), subjective norm (an evaluation of whether relevant others would approve or disapprove of the individual carrying out the behavior) and perceived behavioral control (PBC; an evaluation of whether it will be easy or difficult to carry out the behavior). Attitude can be viewed as broadly encompassing the efficacy and costs dimensions of coping appraisal proposed by protection motivation theory, whereas PBC overlaps substantially with the self-efficacy dimension (Ajzen, 2002). An advantage of using the theory of planned behavior as a framework for assessing coping appraisal is that it involves the evaluation of a wider range of relevant beliefs and attitudes, such as perceived positive consequences of the preventive behavior other than efficacy (e.g., anticipated enjoyment of the activity), barriers to carrying out the behavior other than self-efficacy (e.g., perceived access to SBT), and the perceived views of others. The components of the theory of planned behavior have been shown to predict older people's intentions to exercise and exercise behavior (Benjamin, Edwards, & Bharti, 2005; Courneya, 1995), but they have not previously been studied in the context of SBT.

Although the theory of planned behavior assesses the influence of perceived social pressure from others, it does not measure the influence of social identity and internalized norms for behavior (Terry, Hogg, & White, 1999, 2002). Consequently, the prediction of intentions and behavior may be improved by also assessing relevant aspects of social identity—most importantly, the extent to which the individual considers the behavior to be appropriate for someone like himself or herself (Terry et al., 1999; Sheeran & Orbell, 2000). Qualitative research into attitudes toward falls prevention suggests that social identity may be particularly relevant, because a common reason older people give for refusing to participate in falls prevention activities is that they are inappropriate for people like them (Cameron & Quine, 1994; Simpson et al., 2003; Yardley, Donovan-Hall et al., 2006). This attitude can arise when older people view themselves as too young and fit to need to undertake falls prevention activities, or conversely when they consider themselves too old and frail to be able to carry them out or benefit from them.

In summary, although it is natural and common for those promoting falls prevention programs to focus on the threat posed by falling in order to increase motivation to take preventive action, the findings from qualitative research in this field suggest that perceived threat of falling may not actually provide a compelling motivation for undertaking SBT. Using the theoretical framework of protection motivation theory, our aim in this study was to determine whether threat or coping appraisal are most closely related to older people's intention to undertake SBT, and therefore more likely to promote uptake. By means of a cross-sectional questionnaire survey, we first compared the independent associations between the intention to carry out SBT and each component of threat appraisal (i.e., concern about falling, perceived risk and consequences of falling) and coping appraisal (i.e., assessed by the components of the theory of planned behavior, plus perceptions of appropriate social identity). We then used structural equation modeling to directly test the hypothesis that intention to undertake SBT was more closely related to coping appraisal than threat appraisal.

Methods

Design and Participants

We obtained quantitative measures of participants' attitudes, beliefs, and intentions from 715 older people on a single occasion by means of postal questionnaire or structured interview. The analyses in this article are based on the data from the 558 people (78.0%) who completed all of the measures. Prior approval was granted by the University of Southampton School of Psychology Ethics Committee.

We employed a variety of recruitment methods in order to ensure that the study included a wide range of people of different ages (minimum age 60 years), gender, socioeconomic background, levels of physical functioning, and medical history, with oversampling of populations at greater risk of falling and fall-related injury. We recruited a sample of 451 participants to a postal survey by placing advertisements for volunteers in magazines and on Internet Web sites for older and retired people, and by distributing questionnaires through clubs, leisure groups, and community organizations (e.g., the Women's Institute, bridge clubs, and church groups) and through lay support organizations for people with a higher than average risk of falling or falling-related injury (e.g., due to osteoporosis, Meniere's disease, arthritis, and multiple sclerosis). To ensure participation of people with disabilities and impairments that might make it difficult for them to complete a postal survey, we recruited 107 people in independent but supervised accommodations or attending lunch clubs for older people for face-to-face structured interviews by supplying managers of these schemes with posters and leaflets inviting participation.

Measures

For the purpose of this study, we created a questionnaire that assessed intentions concerning SBT and measures of coping appraisal (attitudes, subjective norm, and perceived behavioral control and identity), using methods prescribed for applying the theory of planned behavior (Godin & Kok, 1996). The questionnaire commenced by defining SBT as undertaking daily physical activity specifically to build strength in the legs and body and to improve balance; examples of such activity were given, including balancing exercises, dancing, and T'ai Chi. All

items were scored on a 7-point scale from agree strongly to disagree strongly, with 4 as the midpoint (i.e., attitude neither positive nor negative). We created scale totals by summing scale items, which we reverse scored where necessary so that higher scores indicated a more positive attitude to SBT, and then dividing by the number of items in the scale to give comparable total scores from 1 to 7.

We assessed the intention to undertake SBT by means of two items: "I intend to or would do balance training if I am or was offered the opportunity." Cronbach's alpha was $\alpha = 0.97$ (we calculated all values of Cronbach's alpha reported in this article from the data from this survey). We assessed attitude to SBT by means of four items with a Cronbach's alpha of $\alpha = 0.78$: two items rated the expected benefits or disadvantages of SBT (useless–useful, very good–very bad), and two items rated the expected affect resulting from SBT (proud–embarrassed, anxious–confident). We assessed subjective norm by means of two items asking about whether the respondents believed that their doctors and their friends and family would think they should do SBT. Cronbach's alpha was $\alpha = 0.84$. We assessed PBC by means of two items asking whether the respondents thought that, if they wanted to do SBT, they would find it difficult to carry out or were confident that they could do it. Cronbach's alpha was $\alpha = 0.71$. We assessed identity by means of a single item asking whether the respondents believed that they were the kind of person who should do SBT.

A further seven items assessed relevant beliefs, that is, level of agreement with common statements about SBT made by older people in previous qualitative research (Yardley, Bishop et al., 2006). Principal components analysis of these items with oblique rotation revealed two correlated factors ($r = .35$). The first comprised items assessing whether the respondents agreed that doing SBT would be enjoyable (loading = 0.72), would help them to go out and about more easily (factor loading = 0.84), be stronger and more healthy (loading = 0.81), and be less likely to fall and be injured (loading = 0.79). The second factor comprised items assessing whether the respondents agreed that doing SBT would be tiring or painful (factor loading = 0.86), could be harmful (loading = 0.82), or would take too much time and effort (loading = 0.50). We labeled factor scores from the first factor as *behavioral beliefs* (the conventional terminology for beliefs about anticipated outcomes of SBT, which should influence attitude), and those from the second as *control beliefs* (these concerned perceived barriers to carrying out SBT, which should influence PBC).

To assess threat appraisal, we used two existing measures of fear, that is, perceived severity and vulnerability, and created two additional indicators of vulnerability. We measured perceived physical and psychosocial fall consequences (severity) by using the 12-item Consequences of Falling Questionnaire (Yardley & Smith, 2002), which has a score range of 12 to 48 (Cronbach's $\alpha = 0.93$). We measured perceived fall likelihood (vulnerability) directly by using two 4-point items we constructed that asked whether the respondents felt it was likely or possible that they would fall in the coming year (Cronbach's $\alpha = 0.87$). The Falls Efficacy Scale–International (FES-I; Yardley et al., 2005) measured how concerned respondents were about falling when they were carrying out a range of activities inside and outside the home, which could be considered a function of all three dimensions of perceived threat. This 16-item scale has a score range of 16–64, and it had a Cronbach's alpha of $\alpha = 0.96$. Finally, we created an indicator of vulnerability from items assessing the following risk factors: how many times in the past year the respondent had "fallen over" (scored as never, once, or twice or more); the presence of self-defined chronic illness or disability, dizziness, or unsteadiness; taking four or more medications; or taking psychoactive medication. We summed responses to these items to produce a cumulative estimate of number of self-reported risk factors present.

Our collected demographic data comprised age, sex, and previous primary occupation (or that of spouse if never previously employed).

Analysis

There was a strong positive skew on all measures of perceived appropriateness of SBT that could not be corrected by any transformation, so we used Spearman's rank correlations to determine bivariate relationships between the measures of intentions, coping appraisal, threat appraisal, and participant characteristics.

We then used structural equation modeling (through the AMOS 6.0 program) to determine the relationship of threat and coping appraisal to intention to undertake SBT. We measured threat appraisal by the risk factors, fall likelihood, fall consequences, and the FES-I indicators. We measured coping appraisal by the attitude, subjective norm, PBC, and identity indicators (we could not include attitudinal and behavioral beliefs because of their multicollinearity with the other indicators). We first evaluated the fit of a model in which both threat and coping appraisal predicted intention (see Figure 1) by using the recommended Comparative Fit Index (CFI) and root mean square error of approximation (RMSEA) statistics for goodness of fit (Byrne, 2001), which vary from 0 to 1. To demonstrate adequate fit of the data the CFI should certainly be above 0.90, and ideally should exceed 0.95, whereas the RMSEA should be less than 0.08, and ideally less than 0.05. To improve the fit of the measurement model we then allowed the error terms of meaningfully related indicators to freely covary. We evaluated the improvement in the fit of the model by the change in CFI and RMSEA and by the difference in the chi-square value obtained for the original and modified models. To check that the nonnormal distribution of our data did not affect the fit of the model we also calculated the Bollen–Stine statistic from 250 bootstrap samples; if the model fits these samples well, then this will have a value of $p > .05$. Finally, we examined the effect of adding age and gender to the model, using the CFI, RMSEA, and change in chi-square value.

To determine whether the interaction between coping and threat appraisal predicted intention, we created composite measures of coping and threat appraisal by using the factor scores from a principal components analysis of the indicators of coping and threat appraisal. We computed the interaction term by multiplying the factor scores for the threat and coping appraisal factors, and then we related this to intention by using Spearman's rank correlation.

Results

Participant Characteristics

The mean age of participants was 74.4 years ($SD = 7.19$), with a range of 60 to 95 years. Demographic and falls-related

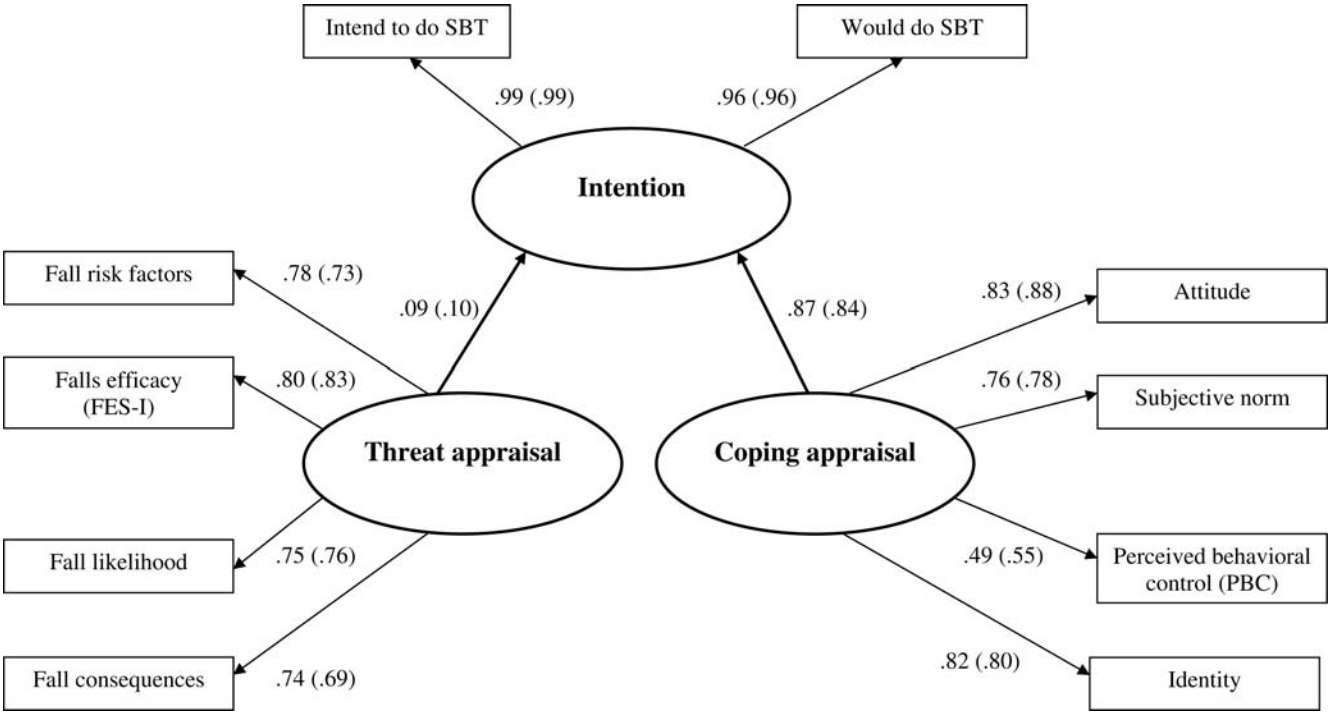

Figure 1. Model of the relationship of coping and threat appraisal to intention to undertake strength and balance training (SBT). The regression weights obtained in the final model are shown beside each path, with the regression weight in the original model in parentheses. (Note that all the paths in the model were significant at $p < .001$, apart from the path from threat appraisal to intention, which was significant at $p = .029$. FES-I = Falls Efficacy Scale–International.)

characteristics of the sample are shown in Table 1. Almost three times as many women as men took part. Nearly half the participants in the sample were categorized as having been in either higher (115; 20.6%) or lower (154; 27.6%) managerial and professional occupations. Of the remainder, 116 (20.8%) were in intermediate occupations (e.g., secretary, firefighter), 64 (11.5%) were small employers or in lower supervisory occupations, and 94 (16.8%) had been in semiroutine and routine occupations. Just over half the participants had fallen at some time during the past year, and 126 people (22.6% of the sample) had fallen twice or more often. One in three people ($n = 198$; 35.5%) agreed that it was likely they would fall during the coming year, and 325 (58.2%) agreed that it was possible they would fall during the coming year.

Table 1 also shows the pattern of responses to the questionnaire assessing perceived appropriateness of SBT. The full range of possible responses was represented for every item, but there was a strong skew toward positive attitudes and intentions toward SBT.

Bivariate Relationships

Relationships between participant characteristics, threat appraisal, coping appraisal, and intention are shown in Table 2. Older people and women had higher levels of perceived threat of falling, but not higher levels of reported risk factors, than did younger people and men. Younger respondents and women were somewhat more positive in their coping appraisal than were older respondents and men. Lower occupational status was related only to greater perceived falls severity ($r = .18$, $p < .01$) and concern about falling (FES-I scores; $r = .16$, $p < .01$). Older respondents and women were slightly less inclined than younger respondents and men to undertake SBT.

All the measures of falls-related threat were intercorrelated. Threat appraisal was largely unrelated to attitudes toward SBT, but it was negatively related to PBC and marginally related to higher subjective norms. This indicates that those who perceived more threat from falling felt that other people believed that they should undertake SBT, but they were uncertain of their ability to do so. All the measures of coping appraisal were also intercorrelated.

Intention to carry out SBT was related strongly to all the measures of coping appraisal but was not systematically related to threat appraisal (see bottom row of Table 2).

Multivariate Relationships

The initial fit of the model shown in Figure 1 was promising, with values of CFI = 0.932 and RMSEA = 0.119 (90% confidence interval or CI = 0.107–0.132). However, the model was not entirely satisfactory, as it differed significantly from the observed data ($\chi^2 = 294.10$, 33 *df*, $p < .001$). An examination of the modification indices revealed that the lack of fit related to the measurement of threat and coping appraisal rather than the relationships we had specified between these variables and intention. As might be expected from the pattern of bivariate correlations shown in Table 2, there was some covariance that we had not modeled between the residual measurement error of the indicators of threat and coping appraisal. In other words, some error variance was shared by

Table 1. Participant Characteristics and Scale Distributions

Characteristic	Yes *n* (%)	No *n* (%)	Median	Interquartile range
Female	397 (71.1)	161 (28.9)		
Managerial–professional	318 (57.0)	264 (47.3)		
Reported fall risk factors				
Fell in past year	294 (52.7)	264 (47.3)		
Chronic illness	407 (72.9)	151 (27.1)		
Taking ≥ 4 medications	181 (32.4)	377 (67.6)		
Psychoactive medication	79 (14.2)	479 (85.8)		
Dizziness–unsteadiness	351 (62.9)	207 (37.1)		
Falls Efficacy Scale–International			27.5	20–40
Fall likelihood			2.5	2–3
Fall consequences			29.0	24–33
Attitude			5.5	4.5–6.3
Subjective norm			5.5	4–7
Perceived behavioral control			6.0	4–7
Identity			6.0	4–7
Intention			6.0	4–7

Notes: Participant characteristics are shown as *n*, with % of total sample in parentheses; scale distributions are median and interquartile range. All scales are scored so that a high score indicates a higher level of threat appraisal (i.e., concern about falling) or coping appraisal (i.e., a more positive attitude toward undertaking strength and balance training.

indicators, and a small portion of the variance in the measures of coping appraisal related to variance in threat appraisal, and vice versa. Some degree of shared error variance between measures of falls risk and of the theory of planned behavior constructs was not unexpected, because attitudes are likely to be related to social identity and subjective norms, and it seems implausible to expect beliefs about falls prevention to be completely unrelated to perceived threat of falls. Accordingly, we revised the model to allow these error terms to covary. (We allowed the error terms for the following variables to covary: fall consequences with fall risk factors; attitude and subjective norm; PBC with attitude, identity, falls efficacy, and fall consequences. In addition, we allowed the error terms for all the indicators of coping appraisal to covary with the error term for threat appraisal.) The fit of the model improved significantly (chi-square value for the difference between the models was $\chi^2 = 265.27$, 10 *df*, $p < .001$), resulting in a model that did not significantly depart from the observed data ($\chi^2 = 28.83$, 23 *df*, $p = .186$), with values of CFI = 0.998 and RMSEA = 0.021 (90% CI = 0.000–0.043). The Bollen–Stine value was $p = .355$, confirming that the model also fit the 250 bootstrap samples taken from the data. The standardized regression weights for the initial and the final models are given in Figure 1. In both models the intention to undertake SBT was much more strongly related to coping appraisal than to threat appraisal.

To determine whether age and gender could be usefully included in the model, we fitted a model with these variables as predictors of threat and coping appraisal. This model was a slightly less good fit of the data (CFI = 0.984, RMSEA = 0.054, 90% CI = 0.041–0.067), and it significantly departed from the observed data ($\chi^2 = 102.596$, 39 *df*, $p < .001$). Older age was positively related to threat appraisal ($r = .17$, $p < .001$) and negatively related to coping appraisal ($r = -.17$, $p < .001$). Female gender was positively related to threat appraisal ($r = .11$, $p = .009$) and coping appraisal ($r = .18$, $p < .001$).

The interaction between threat and coping appraisal was not significantly related to intention ($r = -.04$, *ns*), so we did not include it in the model.

Discussion

Intentions to undertake SBT were much more closely related to coping appraisal than to threat appraisal. Coping appraisal was based on an evaluation of the many potential benefits of SBT, including enjoyment of the activity and improvement in general health, mood, confidence, and the ability to get out and about—as well as a reduction in the risk of a fall. As predicted from qualitative research (Cameron & Quine, 1994; Simpson et al., 2003; Yardley, Donovan-Hall et al., 2006), the respondents' intention to carry out SBT was strongly associated with the belief that SBT was an appropriate activity for someone like themselves, and that their family, friends, and doctor considered SBT to be suitable for them. Concerns about whether the SBT exercises would be

Table 2. Spearman's Rank Correlations Between Participant Characteristics, Threat Appraisal, Coping Appraisal, and Intention to Undertake SBT

	1	2	3	4	5	6	7	8	9	10	11	12
1. Age	—											
2. Gender	.01	—										
3. No. of risk factors	.07	.00	—									
4. FES-I score	.20**	.14*	.64**	—								
5. Fall likelihood	.13**	.09*	.62**	.62**	—							
6. Fall consequences	.18**	.25**	.43**	.63**	.51**	—						
7. Attitude	−.13*	.16*	−.08*	−.06	.00	−.05	—					
8. Behavioral beliefs	−.10*	.19**	−.05	.01	.02	.06	.91**	—				
9. Subjective norm	−.10*	.14**	.04	.09*	.12**	.11*	.69**	.69**	—			
10. PBC	−.13**	−.05	−.20**	−.29**	−.14**	−.28**	.60**	.48**	.39**	—		
11. Control beliefs	−.12**	.02	−.20**	−.27**	−.16**	−.30**	.64**	.38**	.31**	.62**	—	
12. Identity	−.11**	.15**	.12**	.19**	.18	.12**	.68**	.67**	.63**	.36**	.25**	—
13. Intention	−.12**	.18**	.05	.08	.10*	.08	.74**	.72**	.66**	.44**	.36**	.73**

Notes: SBT = strength and balance training; FES-I = Falls Efficacy Scale–International; PBC = perceived behavioral control.
*$p < .05$; **$p < .01$.

harmful, tiring, or painful and whether the respondents would be able to do them were also related to the strength of intention to undertake SBT.

Our findings are consistent with those from research into other health behaviors using the framework of protection motivation theory, where a stronger and more reliable influence of coping than threat appraisal on preventive behavior has generally been found (Maddux & Rogers, 1983; Milne et al., 2000; Ruiter et al., 2001; Witte & Allen, 2000). Higher levels of perceived threat can have variable effects, sometimes motivating preventive behavior but often leading to denial and avoidance, particularly if confidence in the preventive behavior is low (Rippletoe & Rogers, 2006). Our findings are also consistent with research into attitudes to other forms of falls prevention. For example, in a study of adherence to wearing hip protectors, adherence was not predicted by falls risk factors or fear of falling but was predicted by self-efficacy and concerns about the difficulties associated with wearing hip protectors (Kurrle, Cameron, & Quine, 2004). Issues that older people consider relevant to the decision to wear hip protectors include concerns about effort, comfort, and appearance (Cameron & Quine, 1994), just as respondents in our study considered a much wider range of costs and benefits of SBT than simply falls risk reduction.

The limitations of this study should be taken into account when one is interpreting our results. Our implementation of protection motivation theory diverged somewhat from the original model, because we used the theory of planned behavior to assess coping appraisal. The measurement of PBC provides only an indirect estimation of self-efficacy, and a more specific and comprehensive measure of this construct might have added to the explanation of intentions to undertake SBT. For reasons of analytic parsimony we did not attempt to examine all the possible interactions between coping and threat appraisals that might have contributed to intentions. Our observational design can only suggest associations between variables, which do not necessarily reflect an underlying causal relationship. However, numerous studies in which coping appraisals were experimentally manipulated have demonstrated that they have a causal influence on both intentions and behavior (Witte & Allen, 2000). In addition, despite the variety of recruitment methods we used to maximize the diversity of our respondents, our sample cannot be considered representative of the general population, as our sampling strategy resulted in a higher proportion of people at risk of falling, and those with an interest in SBT, who were therefore likely to have more favorable attitudes toward it.

In this study we were able to assess only expressed attitudes and intentions to carry out SBT, and not actual participation in SBT programs. Nevertheless, there is a substantial body of evidence showing that intentions do normally predict immediate behavior (Webb & Sheeran, in press), and so our findings are most relevant to understanding factors that may influence the initial uptake of SBT. Because intentions are a necessary but often not sufficient basis for taking action (Sheeran, 2002), further research is required to determine how best to help older people to carry out their intention to undertake SBT. Research into adherence to exercise suggests that there are numerous additional factors that are likely to influence whether older people actually do take up SBT and carry it out over an extended period, including the following: the accessibility and format of programs offered; the extent to which older people are made aware of these programs; barriers such as comorbid illness or low levels of self-efficacy; and the support they receive for planning and performing the activities involved (Martin & Sinden, 2001; Schutzer & Graves, 2004; Sniehotta, Scholz, & Schwarzer, 2005).

Despite these considerations, our findings do appear to provide some support for the recommendations arising from qualitative research (Commonwealth Department of Health and Aged Care, 2001; Health Education Board for Scotland, 2003; McInnes & Askie, 2004; Yardley, Bishop et al., 2006; Yardley, Donovan-Hall et al., 2006) that recruitment messages that emphasize the multiple benefits of SBT (e.g. enjoyment and maintaining health, mobility and independence) may have more relevance to older people's motivation to undertake SBT than messages that try to convince people that they need to take part because they are at risk of falling. It may also be helpful to promote undertaking SBT as an activity associated with a positive social identity, and to ensure that older people feel that their family, friends, and doctor would approve of their taking part.

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