Objective. This study investigated patterns of participation in daily living tasks by older adults with fear of falling. The relationship between reported participation in a broad set of daily living tasks and the risk of falling involved in task performance—or activity-related risk—as judged by occupational therapists was examined. Further, several characteristics of older adults that have been associated with fear of falling were examined to determine which older adults had patterns of participation most strongly associated with the activity-related risk.

Method. Thirty-eight occupational therapists were surveyed and asked to judge the activity-related risk in performing specific daily living tasks. Additional data were obtained from 339 older adults with fear of falling who participated in a previous study on the effectiveness of an intervention to reduce fear of falling. Older adults' participation in daily living tasks as measured by items of the Sickness Impact Profile was correlated with the judgments of activity-related risk controlling for potential confounding factors. Univariate regression analyses and t tests were used to determine whether several characteristics of older adults were associated with the relationship between participation and activity-related risk.

Results. Small to moderate significant relationships were found between older adults' participation in daily living tasks and the activity-related risk as judged by occupational therapists ($r = –.25$, $p < .0001$). Older adults with the lowest confidence in ability regarding falls had the strongest relationships.

Conclusion. Activity-related risk is an aspect of daily living tasks that relates to participation in activities by older adults with fear of falling. Knowledge of the activity-related risk involved in daily living tasks can be used to facilitate occupational performance in clients with fear of falling and associated activity restriction.

According to Law et al.'s (1996) model, occupational therapists need to consider three elements to facilitate occupational performance: qualities of the person, such as abilities, interests, and life experiences; the environment, such as the social, socioeconomic, and physical aspects; and the tasks and activities that make up a client's occupation. Law et al. define occupation as groups of self-directed tasks and activities that persons participate in over time. Although all elements of the Person–Environment–Occupation Model interact with each other to result in occupational performance, the occupation element is not well understood.

Among older adults living in the community who have
a fear of falling, participation in the tasks and activities that comprise occupations is important to examine because these adults may begin to restrict their participation in daily life. Fear of falling is associated with decreased social activities, mobility, and quality of life (Arfken, Lach, Birge, & Miller, 1994). This fear can develop after sustaining a fall; however, it also may be experienced without ever having fallen (Maki, Holliday, & Topper, 1991; Silverton & Tidelis utilized). An estimated 30% to 55% of older persons acknowledge being afraid of falling, and approximately one third of them report restricting their activities (Arfken et al., 1994; Fessel & Nevitt, 1997; Howland et al., 1998; Nevitt, Cummings, Kidd, & Black, 1989; Tinetti, Mendes de Leon, Douchette, & Baker, 1994; Walker & Howland, 1991).

The restriction of activities among older adults with fear of falling may be especially harmful because it is thought to accelerate the deterioration of physical capabilities below what might be lost due to disease or aging-related factors alone (Burker et al., 1995). Specifically, older adults may begin to restrict tasks and activities that they are otherwise capable of performing in an attempt to prevent a fall. This activity restriction may increase the risk of losing muscle strength and endurance due to consequences of inactivity (Jette, 1994). As older adults become more inactive, they become more at risk for falls (Nevitt et al., 1989). In addition, as physical capabilities decrease and affect balance, more fear of falling occurs and restriction of activities increases.

Little is known about self-imposed activity restrictions by persons with fear of falling. Although two studies (Fessel & Nevitt, 1997; Lachman et al., 1998) have examined the types of tasks that older adults restrict, they do not examine the characteristics of those tasks, such as the actual risk of falling associated with performance, or the activity-related risk. Certain activities require displacement of a person’s center of mass, and this challenge to balance is associated with falls (Tinetti & Speechley, 1989). For instance, the daily living tasks of dressing, bathing, and doing housework that require displacing actions, such as bending, have been associated with falling (Maki & McIlroy, 1996).

The purpose of this study was to determine whether participation in daily living tasks reported by a large sample of older adults with fear of falling (Tennstedt et al., 1998) was associated with the activity-related risk in those tasks as judged by occupational therapists. Characteristics of older adults that have been associated with fear of falling were then examined to determine whether they were associated with this relationship. We reasoned that older adults with specific personal characteristics may have heightened awareness of the risk of falling in daily living tasks and may demonstrate the strongest relationships between their participation and the activity-related risk. The following research questions were proposed:

- Is there a relationship between older adults’ reported participation in daily living tasks and the activity-related risk in those tasks, controlling for other factors thought to be associated with task performance (e.g., the cognitive demand, the necessity to perform tasks to live independently, the monetary cost)?
- Will the relationship between older adults’ reported participation in daily living tasks and the activity-related risk be strongest for persons who have characteristics associated with fear of falling (i.e., older, female, history of falls, less perceived ability to manage falls, less perceived control over falling)?
Older adult sample. At 6 weeks, 388 older adults were participating in the Tennstedt et al. (1998) study. These participants consented to allow the use of their data for that study as well as for other investigations, such as the one presented here. Participants were initially included in the current study if they had completed data on participation in at least 10 of 15 daily living tasks. All but 14 participants were included on the basis of this criterion. Additionally, 35 participants were excluded from the study because they reported full participation in all 15 daily living tasks. The remaining sample of 339 participants was similar to the original sample of 388 participants. Both samples were the same age, were 90% women, and had 14% of participants report falls in the prior month. No significant differences existed between the two samples on these variables.

Instruments

Participation in daily living tasks. The older adults’ self-reported responses to select items from the Sickness Impact Profile (SIP; de Bruin, Buys, de Witte, & Diederiks, 1994) were used to measure participation in daily living tasks (see Table 1). In addition to estimating physical function, the SIP has been used to estimate the psychological impact of illness and quality of life (Ahlstrom & Gunnarsson, 1996; Schuling, Greidanus, & Meyboom-de Jong, 1993). Originally, 22 items that reflected participation in daily living tasks were selected for the current study from the 68-item SIP. Items were selected if they reflected participation in basic or instrumental activities of daily living (ADL) that are often included in ADL assessments, such as bathing, dressing, and light and heavy housework, or participation in other aspects of daily life, such as leisure and social activities. Items were culled from four of the six subscales of the SIP: Somatic Autonomy, Mobility Control, Mobility Range, and Social Behavior. Items were not grouped into the SIP subscales for analysis because various daily living tasks may be judged to have very different risks of falling; this variability might not be evident if scores on tasks within a subscale were combined and averaged. However, item composites were formed to combine SIP items that represented a certain daily living task and to reduce redundancy. Composites were formed if intercorrelation coefficients (ICCs) were ≥ .30. In Table 1, the first column displays the 15 daily living tasks used in the analysis; the second column shows the 22 original SIP items categorized by the daily living task they comprised.

Participants in the Tennstedt et al. (1998) study rated the 22 SIP items as true or false. Items that were reported as true were given a higher score to reflect disability. In this study, we decided to reverse the scoring in this analysis for ease of interpretation (i.e., true = 0, false = 1). Therefore, a higher score indicated more participation in daily living tasks. If reported participation in daily living tasks was related to the activity-related risk, less participation (or lower scores) would be expected in activities that have higher activity-related risk, resulting in a negative association.

Activity-related risk of falling. Judgments of activity-related risk during participation in daily living tasks were assessed by a survey of 38 occupational therapists. The therapists rated each of the 15 daily living tasks shown in Table 1 on a 7-point Likert scale (1 = very low risk of falling, 7 = very high risk of falling). Because the disability statements on the SIP were not appropriate for the therapist sample to rate using the exact wording, the therapists were provided with the name the 15 daily living tasks followed by additional descriptors from the SIP, if available. For instance, for the daily living task of inactive recreation, therapists rated the risk of falling of “inactive recreation, such as watching TV, playing cards, or reading.” The risk of falling was defined as the amount of challenge to a person’s balance that the activity requires. Ratings of activity-related risk were averaged across therapists for each task, and the mean ratings of activity-related risk for the 15 tasks were standardized on a scale in which the mean was 0 and the standard deviation was 1 (see Table 2). The standardized, mean rating of activity-related risk for each task served as a “weight” to be used in the analysis representing the magnitude of risk of falling in that task (Rosenthal & Rosnow, 1985).

To estimate the internal consistency or stability of the judgments of activity-related risk on the basis of the total set of 38 judgments, the effective reliability was calculated (Rosenthal & Rosnow, 1991) and found to be high (ICC = .99). Convergent and discriminant validity of these judgments were also supported (Murphy et al., 1999). Table 2 shows the rankings of daily living tasks by risk of falling as judged by the therapist sample.

Other factors involved in task performance. On the same survey, the therapist sample rated on a 7-point Likert scale the magnitude of cognitive demand, necessity, and monetary cost involved in participation in the 15 daily living tasks (Murphy et al., 1999). Weights were calculated for each task from the standardized, mean judgments (Rosenthal & Rosnow, 1985). Therefore, in addition to the activity-related risk weight, weights were calculated for the magnitude of cognitive demand, necessity, and monetary cost involved in performance of each task. High effective reliability of the judgments for cognitive demand (ICC = .96), necessity (ICC = .99), and monetary cost (ICC = .96) were found (Murphy et al., 1999).

Data From the Tennstedt et al. (1998) Study

Fear of falling. Fear of falling was assessed with the Fall Efficacy Scale (Tinetti, Richman, & Powell, 1990). Participants rated how assured they were of their ability to perform 10 activities without falling on a 4-point scale.
Cronbach’s alpha for this scale ranged from .70 to .76, indicating more fear of falling. Activities included in this scale were house cleaning, getting dressed and undressed, taking a bath or shower, preparing simple meals, shopping, getting in and out of a chair, going up and down stairs, walking around the neighborhood, reaching into cabinets or closets, and hurrying to answer the phone. This scale has been shown to have good test–retest reliability (Tennstedt et al., 1990). The Tennstedt et al. (1998) study added two activities: exercise and carrying bundles from the store. The average rating of the 12 items was used to represent each participant’s level of fear of falling for the current study.

Perceived control over falling. On a five-item scale, participants rated their confidence in their ability to manage falls: finding a way to get up after a fall, finding ways to reduce falls, ability to protect themselves if a fall occurred, increasing their physical strength, and getting more steady on their feet. All items were rated on a 4-point scale (1 = very sure, 4 = not at all sure). A higher score on items indicates a greater perceived ability to manage falls. The Cronbach’s alpha for this scale ranged from .76 to .84, indicating adequate internal consistency (Tennstedt et al., 1998). The average rating of the four items was used for the current study.

Data Analysis

We decided to conduct analyses separately by gender on the basis of our initial comparisons of differences in the magnitude of correlations among SIP items for women and men. In a preliminary analysis, we examined correlations between measures to determine whether composites should be formed. Intercorrelations were examined among measures of fear of falling, perceived ability to manage falls, and perceived control over falling to determine whether they reflected a single unitary concept of fall-related concerns. Measures were combined into composites if \( r \geq .30 \) by gender. Measures of fear of falling and perceived ability to manage falls were significantly correlated with our composite called “confidence in ability regarding falls” because they were highly correlated (\( r = .66 \)). Perceived control over falling initially met the criteria of being formed into this composite because of moderate correlations with measures of fear of falling (\( r = .36 \)) and perceived ability to manage falls (\( r = .46 \)). However, from subsequent analyses, we decided that the measure of perceived control should remain separate from the composite.

The relationship between participation in daily living tasks and activity-related risk was first calculated for each participant, controlling for the effects of cognitive demand.

Table 1

<table>
<thead>
<tr>
<th>Daily Living Task</th>
<th>Item Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dressing</td>
<td>I get dressed only with someone else’s help.</td>
</tr>
<tr>
<td></td>
<td>I do not fasten my clothing, for example, require assistance with buttons, zippers, shoelaces.</td>
</tr>
<tr>
<td></td>
<td>I dress myself, but do so very slowly.</td>
</tr>
<tr>
<td>Bathe</td>
<td>I do not bathe myself completely—require assistance with bathing.</td>
</tr>
<tr>
<td></td>
<td>I do not bathe myself at all, but am bathed by someone else.</td>
</tr>
<tr>
<td>Eating</td>
<td>I feed myself with help from someone else.</td>
</tr>
<tr>
<td>Heavy housework</td>
<td>I am not doing heavy work around the house.</td>
</tr>
<tr>
<td>Light housework</td>
<td>I am not doing any of the house cleaning that I would usually do.</td>
</tr>
<tr>
<td></td>
<td>I am doing less of the regular work around the house than I would usually do.</td>
</tr>
<tr>
<td>Handiwork</td>
<td>I have difficulty doing housework—turning faucets, using kitchen gadgets, sewing, carpentry.</td>
</tr>
<tr>
<td>Community activities</td>
<td>I am doing fewer community activities.</td>
</tr>
<tr>
<td>Social activities</td>
<td>I am doing fewer social activities with groups of people.</td>
</tr>
<tr>
<td></td>
<td>I am cutting down the length of visits with friends.</td>
</tr>
<tr>
<td>Shopping</td>
<td>I am not going out to visit people at all.</td>
</tr>
<tr>
<td>Clothes washing</td>
<td>I am not doing any of the shopping that I would usually do.</td>
</tr>
<tr>
<td>Hobbies and recreation</td>
<td>I am not doing any of the clothes washing that I would usually do.</td>
</tr>
<tr>
<td>Sexual activity</td>
<td>My sexual activity is decreased.</td>
</tr>
<tr>
<td>Out for entertainment</td>
<td>I am going out for entertainment less often.</td>
</tr>
<tr>
<td>Inactive recreation</td>
<td>I am cutting down on some of my usual inactive recreation and pastimes—</td>
</tr>
<tr>
<td></td>
<td>watching TV, playing cards, reading.</td>
</tr>
<tr>
<td>Budgeting</td>
<td>I have given up taking care of personal or household business affairs—paying bills, banking, working on budget.</td>
</tr>
</tbody>
</table>

(\( r = .71 \); \( r = .66 \)). Perceived control over falling initially met the criteria of being formed into this composite because of moderate correlations with measures of fear of falling, perceived ability to manage falls, and perceived control over falling to determine whether they reflected a single unitary concept of fall-related concerns. Measures were combined into composites if \( r \geq .30 \) by gender. Measures of fear of falling and perceived ability to manage falls were significantly correlated with our composite called “confidence in ability regarding falls” because they were highly correlated (\( r = .66 \)). Perceived control over falling initially met the criteria of being formed into this composite because of moderate correlations with measures of fear of falling (\( r = .36 \)) and perceived ability to manage falls (\( r = .46 \)). However, from subsequent analyses, we decided that the measure of perceived control should remain separate from the composite.

The relationship between participation in daily living tasks and activity-related risk was first calculated for each participant, controlling for the effects of cognitive demand,

\( \text{Data Analysis} \)

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The relationship between participation in daily living tasks and activity-related risk was first calculated for each participant, controlling for the effects of cognitive demand,
necessity, and monetary cost with partial Pearson product-moment (partial \( r \)) correlations. Each participant’s reported participation in daily living tasks was correlated with the weights reflecting each of the four task characteristics. Although the weights remain constant when calculating partial \( r \) correlations for all participants, each participant had a unique pattern of participation.

After calculating the magnitude of relationship between participation in daily living tasks and activity-related risk for each participant, the partial \( r \) correlations were combined meta-analytically to examine the relationship within the entire sample. First, each partial \( r \) correlation was converted to \( Zr \) for the analysis. This conversion is done when doing meta-analytic combining because \( r \) has a skewed distribution, and converting to \( Zr \) allows for comparison across persons on a normal distribution (Rosenthal, 1994). Results were converted back to \( r \), and a \( p \) value was obtained to examine group significance.

Individual partial \( r \) correlations were performed to evaluate whether the relationship between participation and activity-related risk was significantly different for groups of older adults with specific characteristics (i.e., age, gender, history of falls in the prior month, confidence in ability regarding falls). We performed univariate regression analyses and \( t \) tests to test whether the relationship between participation and activity-related risk (the dependent variable) differed by each characteristic. We then planned to perform a multiple regression analysis, using all characteristics significantly associated with the relationship between participation and activity-related risk in the univariate analyses as independent variables.

Results

Controlling for other factors thought to be associated with task performance, small relationships were found between older adults’ reported participation in daily living tasks and the activity-related risk in those tasks as judged by occupational therapists (\( Z = 27.16, r = -.26, p < .0001 \) for women; \( Z = 7.49, r = -.22, p < .0001 \) for men). Although the overall mean relationship between participation and activity-related risk was small, moderate to large relationships were found in almost half of the sample (\( n = 155 \)). As expected, participation in daily living tasks decreased as the activity-related risk in those tasks increased.

Table 3 shows the results from univariate analyses performed to determine which characteristics of older adults were associated with the relationship between participation in daily living tasks and activity-related risk. Only the amount of confidence in ability regarding falls was associated with the strength of this relationship (\( p = .0001 \)). Specifically, participants who reported less confidence in ability regarding falls had significantly stronger relationships between their participation and the activity-related risk than participants who reported more confidence. Because only one variable was significantly associated with the relationship, a multiple regression was not performed.

Although other characteristics were not significantly associated with the relationship between participation and activity-related risk, trends were examined by grouping participants according to the magnitude of relationship calculated for each individual participant. Groups were divided according to Cohen’s (1988) criteria in which the (negative) relationships between participation and activity-related risk are small (–.10 \( \leq r \leq -.29 \)), moderate (–.30 \( \leq r \leq -.49 \)), or large (\( r \leq -.50 \)). Seventy-eight percent of participants (\( n = 263 \)) were classified into the small, moderate, or large groups according to the magnitude of relationship between their participation and the activity-related risk. The overall mean showed a moderate relationship (\( M = -.34, SD = .14 \)).

Participants who had little to no relationship between activity-related risk in the univariate analyses are shown in Table 3.

<table>
<thead>
<tr>
<th>Characteristic</th>
<th>( n )</th>
<th>( t )</th>
<th>( F )</th>
<th>( p )</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age</td>
<td>337</td>
<td>–</td>
<td>1.18</td>
<td>.28</td>
</tr>
<tr>
<td>Gender</td>
<td>339</td>
<td>1.26</td>
<td>–</td>
<td>.21</td>
</tr>
<tr>
<td>History of falls</td>
<td>339</td>
<td>–0.44</td>
<td>18.12</td>
<td>.0001</td>
</tr>
<tr>
<td>Confidence in ability regarding falls</td>
<td>339</td>
<td>–</td>
<td>1.36</td>
<td>.25</td>
</tr>
</tbody>
</table>

*Note: Univariate regression analyses were performed when variables were continuous (age, confidence in ability regarding falls, perceived control over falling); \( t \) tests were performed when variables were dichotomous (gender, history of falls).*

<table>
<thead>
<tr>
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<td>History of falls</td>
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<td>18.12</td>
<td>.0001</td>
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<tr>
<td>Perceived control over falling</td>
<td>339</td>
<td>–</td>
<td>1.36</td>
<td>.25</td>
</tr>
</tbody>
</table>

*This finding replicates those of an equivalent pilot analysis using the baseline data from the Tennstedt (1998) study in which small effects were found for women (\( r = -.27 \)) and men (\( r = -.26 \)).
participation and activity-related risk \((r < -0.10)\) were excluded from this analysis \((n = 76)\). The no relationship group did not differ with respect to age from the other groups; however, this group had a higher percentage of men than the other groups \((15\%)\) and a higher level of confidence in ability regarding falls \((M = 2.43, SD = .68)\). Paradoxically, participants in the no relationship group also had a higher percentage of falls within the past month \((18\%)\) compared with participants in the moderate \((13\%)\) and small \((7\%)\) relationship groups. Participants with patterns of participation most strongly related to the activity-related risk \((the large relationship group)\) had the lowest level of perceived control over falling and the highest proportion of falls in the prior month compared with those in the moderate and small relationship groups.

### Discussion

This study provides insight into the occupation element of the Person–Environment–Occupation Model \((Law et al., 1996)\). Specifically, the activity-related risk of falling is an aspect of daily living tasks that was associated with reported participation by older adults in this sample. The mean relationship between older adults' reported participation and activity-related risk as judged by occupational therapists for all participants was of a small magnitude \((r = -0.25, p < .0001)\). However, almost half \((46\%)\) of that participants showed moderate to large relationships.

Participants who reported the lowest levels of confidence in ability regarding falls had patterns of participation most strongly related to the activity-related risk. Previous studies have shown that among older adults with fear of falling, confidence is an important factor related to function in daily living tasks. Specifically, fall efficacy, a measure of perceived confidence, is independently related to older adults' function in basic and instrumental ADL and function in social activities \((Tinetti et al., 1994)\). In addition, higher levels of fall efficacy were found to be protective against functional decline in basic ADL \((Mendes de Leon, Seeman, Baker, Richardson, & Tinetti, 1996)\).

The overall relationship found in the present study between participation in daily living tasks, activity-related risk, and confidence in ability regarding falls has implications for assessments of fear of falling and activity restriction. Specifically, this finding supports the incorporation of tasks and activities that have various activity-related risks into these assessments. Current assessments measure fall efficacy \((Powell & Myers, 1995; Tinetti et al., 1990)\). Fall efficacy is based on self-efficacy theory in which beliefs in personal ability influence the choice to engage in an activity \((Bandura, 1986)\). Inaccurate beliefs regarding personal ability to perform tasks without falling may cause older adults to restrict activities unnecessarily. By understanding the activity-related risk and including tasks and activities that have various performance risks in these assessments, clinicians may better understand how older adults with fear of falling restrict their activities. In addition, clinicians may be able to judge whether older clients are unnecessarily restricting their activities by using these assessments along with an evaluation of other elements that can affect occupational performance, such as the client's physical capabilities \((e.g.,\ balance, vision)\) and environmental constraints.

Aside from the finding that confidence was associated with the relationship between participation and activity-related risk, no other characteristics were significantly associated with this relationship. Age and gender may not have been associated with this relationship because little variability existed in this sample. The standard deviation of the mean age was approximately 8 years, and more than 90% of the participants were women. For the characteristic of history of falls in the prior month, the highest proportion who reported falls comprised the large relationship group. However, a high proportion of participants who reported falls comprised the no relationship group. This finding cannot be explained by the current study and requires data on fall severity to determine whether the participants in the large relationship group sustained more severe falls than those in the no relationship group.

### Limitations and Directions for Future Research

The findings can only be generalized to older adults who have some variation in their participation in daily living tasks because older adults who reported full participation in all daily living tasks were excluded from our analyses. In addition, we do not know whether the older adults in this sample restricted participation in their daily living tasks because of their fear of falling. Therefore, it is unclear whether the associations found between participation and activity-related risk reflect restrictions due to a fear of falling or to some factor not measured by the original researchers. Other factors that have been associated with task performance by older adults \((e.g.,\ cognitive demand, necessity of performing tasks to live independently, monetary cost)\) were controlled for in this study. However, older adults may not engage in some daily living tasks for other reasons, such as environmental constraints or a limiting health condition. Future studies need to specifically assess restriction of daily living tasks due to fear of falling.

### Conclusion

This study provides support for the validity of using judgments of activity-related risk to examine patterns of participation in daily living tasks. Findings from this study also extend the knowledge of characteristics associated with particular daily living tasks. On the basis of the Person–Environment–Occupation Model \((Law et al., 1996)\), characteristics of tasks and activities are one aspect of a person's occupational performance. The activity-related risk involved in the performance of daily living tasks...
may be important to consider in addition to personal and environmental factors in order to facilitate occupational performance in clients with fear of falling. Occupational therapists should discuss how fear of falling affects participation in daily life with their clients. If clients are restricting daily living tasks, an understanding of the activity-related risk involved in task performance may provide therapists with another tool to identify clients who may be restricting daily living tasks unnecessarily. ▲

Acknowledgments

We thank Catherine Trombly, S.D., OTRL, FAOTA, and Alan Jette, PT, PhD, for their valuable suggestions on earlier drafts of this article. We also thank Lynn Le, MD, for proofreading and editing earlier drafts of this article. Preparation of this article was supported by grant ST3207462-04 from the National Center for Medical Rehabilitation Research. This article was written in partial fulfillment of the requirements for the Doctor of Science degree at Boston University, Boston, Massachusetts.

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