The Measurement of Physical Functioning in Older Adult Populations

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BSR Physical Performance Meeting (12/12/03)

The Behavioral and Social Research Program at the National Institute on Aging sponsored a meeting on physical performance measurement in December 2003. The purpose of this meeting was to review existing performance protocols and to discuss a number of important issues relating to their use in population-based studies. Based on the outcomes of this meeting, the short-term goal is to develop information and materials that will enhance the ability of interested researchers to evaluate and implement available physical performance protocols in order to address questions relating to functioning. A related goal is to encourage improved measurement of functional outcomes. A longer-term goal is encourage and facilitate coordinated use of a common core set of measures across relevant studies in order to enhance comparability across these studies.

In the following sections, we provide a summary of the background information on the assessment of physical functioning through performance protocols. We conclude with an outline of major priorities identified by meeting participants as targets for future research and/or methodological development.

Introduction

Physical functioning in old age can be described as a combination of the "overall impact of medical conditions, lifestyle, and age-related physiologic changes in the context of the environment and social support system" (Reuben, Seeman, Keeler, Hayes, Bowman, et al., in press). Change in physical functioning is a primary determinant of quality of life in old age; even relatively modest declines in functioning capabilities are associated with loss of independence, increased caregiver burden, and greater financial expenditures (Fried, 2003; Reuben, 2003). Researchers interested in preventing such outcomes are faced with an abundance of available physical functioning measures. Below, we discuss the differences between self-reported versus performance-based measures of physical functioning, describe the advantages and disadvantages of each, and finally, provide an overview of potential avenues for future research.

Defining Physical Function in Older Adults

Physical function can be conceptualized (and studied) across a hierarchy of increasing complexity, from a focus on specific physical movements, such as lifting and walking, to a focus on more integrated activities such as the ability to maintain occupational and social roles (Guralnik & Ferrucci, 2003). Nagi (1976, 1991) described the pathway to diminished physical functioning as a series of four steps (Figure 1; Guralnik & Ferrucci, 2003). The initial step in this pathway is the onset of disease states, followed by the physiological manifestation of disease in multiple systems, leading to functional limitations, such as difficulty walking, grasping, climbing stairs, and ultimately, the onset of disability, described as the inability to fulfill roles. In the last fifteen years, researchers have realized the importance of identifying older adults who have not yet entered Nagi's pathway to disability, but who exhibit pre-clinical changes in functioning (e.g., changes in their ability to complete certain physical movements short of complete

"inability"); identification of these older adults with "pre-clinical disability" may enable identification of interventions to modify the pathway to disability (Fried, 2003).

Halter & Reuben (2001) have proposed a useful model to describe how the "building blocks" of functioning are integrated to form a hierarchy of ability (Figure 2; Reuben, 2003). These building blocks include strength, balance, coordination, flexibility, and endurance; at the most basic level of integration, these elements are coordinated to execute specific physical movements such as rolling over, sitting up, standing, walking, and gripping. In the second integration level, these movements are coordinated into more complex tasks such as dressing, bathing, feeding, writing, and climbing stairs. At the highest level of integration, the basic building blocks are coordinated with cognitive and affective resources to carry out functioning in occupational and social roles.

Traditional self-report measures such as the Katz Activities of Daily Living Scale (Katz, Ford, Moskowitz, Jackson, & Jaffe, 1963), the Rosow-Breslau Scale (Rosow & Breslau, 1966) or the Nagi scales (1991, 1976) largely assess the ability to complete complex activities (e.g., putting on a blouse). More recently developed performance measures include both assessments of complex activities (e.g., walking across a room, putting on a blouse) as well as assessment of the basic building blocks of functioning such as balance, strength, and coordination.

Self Report Measures of Physical Functioning

Self-reported measures in which the participant is asked to report on their functional abilities are considered subjective in that it requires a respondent to either endorse or deny functioning difficulties based on his/her own perceptions of personal "difficulty" in performing activity in question. Commonly used self-report measures generally collect information in terms of either dichotomous as yes/no responses (do/do not have difficulty), or allow for responses along a more graded continuum of reported severity ranging from little difficulty to great difficulty. Early research on physical functioning in old age was primarily based on such self-reported status measures as a means of measuring functioning difficulties.

One of the first such self-report measures was developed by Katz and colleagues (1963), reflecting an assessment of difficulties in performing what were referred to as "Activities of Daily Living" (e.g., dressing, bathing, eating, toileting, transferring from bed to chair, walking across a small room). Since that initial work, assessments of functional abilities have been further refined into 3 general categories of activity (i.e., basic, instrumental, or advanced activities; Reuben, 2003). Basic activities of daily living encompass those covered by the original Katz ADL items including the ability to bathe, dress, toilet, transfer from bed to chair, and feed one's self independently. Instrumental Activities of Daily Living (IADL's) include using the telephone, shopping, preparing meals, housekeeping, taking medications, and handling finances [Lawton & Brody, 1969). Advanced activities of daily living are primarily assessed in clinical settings as person-specific recreational, occupational, and community participation; changes in these daily habits may reflect dysfunction (Reuben, 1990).

Although existing self-report measures for basic, instrumental and advanced activities of daily living have been widely (and profitably) used in studies of functional aging, there is a growing

recognition that more discriminating assessment tools may be needed, particularly tools that allow for assessment of "pre-clinical/pre-disability" changes in the ability to perform various activities (i.e., changes in ability that do not yet rise to the level of eliciting a report of "difficulty" or "inability" to perform the activity but that have resulted in implementation of some type of compensatory or alternative approach to performance of the activity in order to preserve performance ability). For instance, an older woman who may have installed grab bars in her home to assist in bathing and toileting might answer negatively to standard self-report items asking about any difficulty (because with the grab bars she does not perceive that she has any difficulty). Also, if not explicitly queried about possible home modifications, she may not mention the grab bars. Self-report measures under development by Fried and colleagues explicitly target assessment of such behavioral or other modifications that subjects' may have implemented to reduce or eliminate "difficulty" in performing an activity. These new self-report measures, for example, ask those who do not report difficulty or inability a series of additional questions about any behavioral or other modifications they may have made that enable them to continue to successfully perform a given activity with less or no difficulty. (Fried, Bandeen-Roche, Chaves, & Johnson, 2000)

Performance Based Measures of Physical Functioning

Although self-report measures are valuable for identifying older adults at the moderately to severely disabled end of the spectrum, these measures do not discriminate well among non-disabled older adults. In contrast, performance-based measures are considered objective, and therefore, less susceptible to response bias from participants, as well as more sensitive to differences between high functioning older adults. In performance-based measures, a respondent attempts certain tasks or movements while ability is objectively assessed by a test administrator. These objective assessments are generally measured along a continuum in terms of speed, repetition, or capacity and normally are linked with a specific ability necessary for functioning in old age.

Performance assessments can be categorized as measuring either the upper or lower body, and then further organized in terms of the specific function being assessed, such as mobility, range of motion, strength, balance, or gait speed. For the upper body, performance-based assessments include tests of manual dexterity and physical strength. In order to assess manual dexterity, tests may include signing one's name, writing a sentence, buttoning a coat or shirt, picking up a small object, using eating utensils, or transferring beans with a spoon. Standardized assessment tests of manual dexterity include the Pegboard Test, or Williams' board with fasteners, however unlike many performance tests, these require special equipment (Williams, Hadler, & Earp, 1982). To test manual strength, a dynamometer is used to test 'grip strength' (i.e., the degree to which an individual can maximally grasp by hand). Other tests have included lifting ten pounds such as in the Women's Health and Aging Study (WHAS) or determining range of motion in the shoulder, such as in the National Health and Nutrition Examination Survey (NHANES). Additional performance-based assessments include test of ability to perform activities such as lifting a book onto a shelf, carrying a pan of water for one meter then pouring the water into a cup, transferring 7.7 kg of laundry from washer to dryer.

Performance-based assessments for the lower body also include tests of strength, mobility, and/or balance. To assess *lower body strength*, chair stands are a commonly used measure because of the ease of administration as well as the sensitivity to physical function capacity. For this task, a respondent is asked to rise from a chair and then sit once, while the test administrator determines the length of time it takes the respondent to complete the task. The task may then be repeated with five sequential chair stands for greater sensitivity. *Measures of balance* are equally simple to administer since little if any equipment is required. Normally, a series of tests with increasing demand are administered. First, a respondent may be asked to simply stand with legs side by side. Depending upon whether the respondent is capable of completing this task, he/she may be asked to stand semi-tandem, then tandem with eyes open, then closed. Based on performance on this task, the respondent may then be asked to stand on one leg, with eyes open then shut. Finally, a respondent may be asked to make a 360-degree turn, while the administrator times the length of the task.

Similar to tests of balance, performance-based *tests of walking* may be assessed along a range of difficulty, and are primarily based on measures of time and distance. At the most basic level, respondents may be asked to walk at a normal pace while a test administrator times the length of the task. Tasks may be made more difficult by speed assessments, which evaluate both time and distance. For example, a respondent may be asked to walk "as fast as possible" while the administrator counts steps and keeps time. Alternatively, time may be fixed, while distance is measured; respondents may be asked to walk as far as they can in six minutes. At the highest level of difficulty, respondents may be asked to climb stairs while number of steps taken and time are measured.

The tests described above can be considered to have "low technological demand" since, in general, these tests are portable, inexpensive, and can be used in diverse settings in community surveys. In contrast, "high technological demand" measures include those tests that require a greater amount of equipment and expense and may only be administered in laboratory settings. For example, in order to test cardio-respiratory fitness, treadmill tests of VO2 Max may be appropriate. However, these tests require a treadmill, as well as a test of peak flow oxygen based on a "puff-test" which necessitates spirometry. The advantage and rationale for "high-tech" tests is the increased discrimination and sensitivity to physical function, as well as the potential for identifying underlying mechanisms of physical functioning (Reuben, 2003). Other examples of high-tech tests include tests of gait strength as measured by a force plate or machines which measure balance based on center of pressure, force, and sway. These types of tests are primarily administered in laboratory settings.

Performance-based assessments should not be considered as substitutes or "superior" to self-report measures. Rather, objective measures of performance should be evaluated as complementary assessments to an older adult's self-reported perception of difficulty. Some performance-based assessments are closely linked with self-report measures; for example, an older adult's report of her ability to dress herself would likely be linked to her success on an objective performance assessment of her ability to put on and buttoning a blouse or coat. For other performance assessments, however, there is less direct or complete overlap with the standard self-report items. For example, assessment of the ability to stand from a chair would likely be related to (but not "equivalent" to) an older adults reporting about he or her needs for

assistance with transferring from bed to chair. Below, we discuss further the question of appropriate use of both self-report and performance-based assessments as complementary measures of physical functioning in community-based surveys.

For a more detailed discussion of the components of performance-based and self report measures of physical function, as well as a list of performance batteries used in community surveys, consult Guralnik & Ferrucci (2003).

Instrument Selection for Population Surveys

Survey researchers interested in measuring physical functioning in older populations have the difficult task of identifying practical, economical instruments that provide the greatest amount of precision and sensitivity. No one instrument will be appropriate for every older adult population; rather, based on what we now know about self-reported versus performance-based measures, instrument selection should depend upon the characteristics of the population under study (i.e., whether they are community-dwelling or nursing-home residents) and upon the level of function being assessed (Halter & Reuben, 2001). For example, the building blocks of functioning described earlier (strength, balance, coordination, endurance, flexibility) are best measured by performance-based tasks, rather than by self-report. In contrast, the integrated levels of functioning that are based on these building blocks (Figure 2; Reuben, 2003) can be assessed by multiple approaches including self-reported and performance-based measures, as well as proxy reports (Halter & Reuben, 2001). Ultimately, instrument selection is driven by the research question as well as the apparent functioning capacity of the sample population.

Combining Self Report Measures with Performance-Based Measures

It is also important to bear in mind that self-report measures and performance-based measures tap different constructs of physical functioning, and, although complementary, are not readily interchangeable. In order to understand how these measures differ, it is useful to consider the distinction between functional limitations and disability. A disability exists when environmental demands exceed intrinsic capabilities (Fried, 2003). In an experimental setting, an older adult may perform poorly on tests of functioning; however, this poor level of functioning may not translate to disability in daily life depending on the characteristics of their “real life” environment (Guralnik & Ferrucci, 2003). For example, older adults who score poorly on performance-based measures in an experimental setting, may still report no physical functioning difficulties on a self report measure, if they are able to optimize their environment and compensate for performance deficits with other abilities. Clearly, self-reported and performance-based measures assess two related, but different constructs (Fried, 2001; Reuben, 2003).

Researchers have begun to investigate whether self-reported and performance-based measures can be combined to capture a broader spectrum of functioning in a single index. In a recent EPESE study, investigators found that the majority of older respondents in this sample were ADL independent, meaning they did not have difficulties with basic activities of daily living (Reuben et al., forthcoming). However, these same adults had significant mobility impairments as measured by performance-based tasks. For the majority of the sample, the inclusion of

performance-based tasks enhanced discrimination for mortality risk (Reuben et al., forthcoming). Yet, for the small proportion of older adults with multiple self-reported ADL difficulties, the addition of performance-based measures did not add any prognostic value in terms of predicting mortality risk or future financial burden. It appears that although combining self-reported and performance-based measures can widen the scale of physical functioning, it is only informative above a certain threshold of disability (Reuben et al., forthcoming). Table 1 provides an outline of some of the complementary/shared characteristics of various performance-based measures and self-reported measures.

Challenges Inherent to Measuring Physical Functioning

Methodological Issues

The subjectivity of self-reported physical functioning scales present special problems with respect to comparisons across populations or countries. One new assessment tool, developed to provide greater comparability across study populations is the "vignette" approach, currently under development by the World Health Organization (WHO). A vignette (or short story) describing someone with a particular set of health and functional characteristics is read to the respondent; they are then asked to provide their rating of the character's functional status. The results of this research have demonstrated cultural differences in subjective responses to questions of health and well-being (Salomon, Tandon, Murray, & World Health Survey Pilot Study Collaborating Group, 2004). Table 2 provides three examples of vignette strategies to compare health expectations and perceptions in China and Sri Lanka. In terms of interpreting self-report data on physical functioning, this research stresses the importance of contextualizing subjective responses to questions of health.

Although performance-based measures are generally considered more "objective" than the self-report measures, structural and cultural constraints in resources and social norms, both within and between countries, can affect performance measurements across studies as well. Older adults in developing countries, for example, may lack resources such as chairs, beds, or indoor plumbing, that are common in developed countries. In a study of Indonesian older adults, a timed chair stand test was administered in which the older adult was asked to stand for five repetitions while the tester timed the task. It was discovered that Indonesian women consider rising slowly from a chair to be a sign of dignity; subsequently, timed data for these women was significantly slower compared to Indonesian men (Smith, 2003). In sum, although there may be no physical basis for observed cross-national differences in physical functioning, cultural expectations and mores may ultimately affect study outcomes.

Another difficulty in measuring physical functioning is the discriminatory capability of instruments. Self-report measures generally suffer from their distinguish functional abilities among the large population who do not report "difficulty or inability" to perform various activities (i.e., these measures generally identify only the more extreme forms of functional difficulties, leaving a major of the population (even among older adults) with scores indicating no problem). Importantly, however, more sensitive performance measures have clearly shown that this latter group is not homogenous in their functional status as more sensitive performance measures (as well as newer and more sensitive self-report measures; Fried citation?) have

demonstrated this group to be quite heterogeneous with respect to actual functional abilities and have further shown that these differences are predictive of subsequent health and functioning (Seeman, et al, 1994). Performance measures, however, also have their weaknesses as current measures generally do poorly at discriminating among those with the lowest levels of functioning where tests cannot be administered to more frail subjects due to safety or other such concerns. Depending on the choice of performance tests, there can also be ceiling effects if tests are insufficiently calibrated to account for variability at the highest levels of performance (e.g., administration of only the tandem balance, eyes-open for a standard 30 seconds is likely to result in "perfect" scores for a large percentage of adults; Seeman et al, 1994).

Other issues of concern in use of performance measures include: 1) possible bias associated with differential refusal rates for these tests among those characterized by either very poor or good actual functional ability (e.g., either due to fear of poor performance or a perception that the test is "insultingly easy"), and 2) possible impact on assessed ability of effort/engagement in the tasks and the relationship of such effort/engagement to negative affect or other psychological characteristics.

Future Directions to Improve Measurement of Physical Functioning

Meeting participants identified five priority areas for future research and methodological development.

1. Development of internet-based training materials to enhance standardization of physical function assessment

Uniform test administration is essential to future efforts to compare findings across population-based surveys of older adults. To achieve such uniform administration, consistent training mechanisms are necessary. Efforts to develop internet-based training modules for both self-reported and performance-based measures of physical functioning could enhance and facilitate the standardization of physical functioning assessment. These training modules would be available to any researcher interested in physical function, and could be tailored to fit the needs of both clinical and survey researchers. A description of test administration would be provided, as well as an overview of potential methodological difficulties encountered in prior studies. This approach would increase the efficiency of data collection for new studies by outlining the advantages and limitations of physical functioning measures.

2. Further development of self-report assessments targeting pre-clinical disability

Based on the work by Fried et al., (2001, 2000), there is growing recognition that prior to actual functional limitations, older adults frequently experience pre-clinical reductions in their functional abilities and may begin to use compensatory mechanisms to maintain their ability to complete various tasks. While performance measurements are one technique for gathering data that can discriminate among high-functioning older adults (i.e., discriminating those with "pre-clinical" reductions in functional abilities from those without such reductions), Fried and colleagues have also developed self-report tools to assess these early, pre-clinical indications of

functional decline. Evidence indicating that such pre-clinical disability is associated with increased risk for subsequent frank disability points to the potential value in further efforts to refine and expand on Fried's self-report measures in order to identify older adults at high risk for functional loss (Fried, Bandeen-Roche, Chaves, & Johnson, 2000). There may be value in studying these older adults with pre-clinical disability, in order to determine the extent to which intervention strategies reduce the risk of onset of clinical disability.

3. Need for anthropological study of the pathway to disability.

There is need for anthropological investigation of the various pathways through which people may move from high levels of functioning to "pre-clinical" disability to frank disability. For example, we currently lack a comprehensive understanding of the ways in which older adults in different settings develop compensatory mechanisms to avoid functional limitations. A more in-depth, anthropological analysis of such pathway is needed in order to develop better and more complete, standardized assessment tools for use in population-based studies.

4. Development of age-sensitive measures to improve understanding of trajectories of physical functioning across the life course.

Existing self report and performance measures of physical functioning have largely been developed for use in older populations. The appropriateness of these measurement tools for use in younger populations remains to be demonstrated. Research is needed on this topic in order to identify those existing measures that can provide adequately discriminate functional abilities in younger populations. Of the existing measures, performance assessments do exist that are likely to be appropriate for younger groups. However, it is also likely that those interested in assessing differences in functional abilities at younger ages may need to develop new assessment protocols. One promising area of research is the use of adaptive testing, where test item difficulty is determined based on a respondent's performance on previous items. Though used relatively infrequently to date, such adaptive testing protocols provide greater protection against ceiling and floor effects, and discriminate well among very high performers and very poor performers. Adaptive testing may be valuable not only for discriminating patterns of functioning among younger adults, but for identifying highly functional older adults as well.

5. *"Mapping" of self-report vs. performance assessments* – Discussion of possible value of additional work focused on more detailed evaluation of overlap between various self-report and performance measurements.

6. Exploring new technologies – Discussion of possible value of more anthropological, participant observer methodologies for gaining information on the actual ways in which people manage to accomplish daily tasks (e.g., time-motion studies to identify various things that people may do to compensate for early declines in functional abilities).

Summary

- Physical functioning is distinguished from disability, such that older adults may have difficulty performing specific physical tasks, yet experience no interference in their daily life. This period may be identified as “pre-clinical disability”.
- Self-reported measures of physical functioning assess a different, but related, construct from performance-based measures. Whereas, self-reported measures discriminate well among poorly functioning older adults, they do not adequately distinguish older adults with high levels of functioning ability. Likewise, compared to self-rated measures, performance-based measures have superior sensitivity and specificity in discriminating among older adults with high levels of physical functioning, yet may not be appropriate for older adults with very low levels of physical functioning.
- Future development in research on physical functioning among older adults should include:
    - Internet-based training to streamline test administration across studies.
    - Based on Fried’s findings, initiatives to develop research protocols to determine how compensatory mechanisms and modifications affect the period of pre-clinical disability and the onset of disability.
    - A qualitative, anthropological study of the pathway to disability.
    - Development of age-sensitive measures to increase understanding of trajectories of physical functioning across the life course, including attention to need for adaptive testing approaches to refine sensitivity and specificity in identifying levels of physical functioning across various age ranges.

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Figure 1. The theoretical pathway to disability.

Pathology →	Impairment →	Functional Limitation →	Disability
Disease, injury, congenital/developmental condition	Dysfunction and structural abnormalities in specific body systems (musculoskeletal, cardiovascular, etc.)	Restrictions in basic physical and mental actions (ambulate, reach, grasp, climb stairs, speak, see standard print).	Difficulty doing activities of daily life (personal care, household management, job, hobbies).
Example			
Denervated muscle in arm due to trauma	Atrophy of muscle	Cannot pull with arm	Change of job; can no longer swim recreationally

Source: Guralnik, J., & Ferrucci, L. (2003). Assessing the building blocks of function: Utilizing measures of functional limitation. *American Journal of Preventive Medicine, 25*, 112-121.

Figure 2. A framework for the hierarchy of physical functional status.

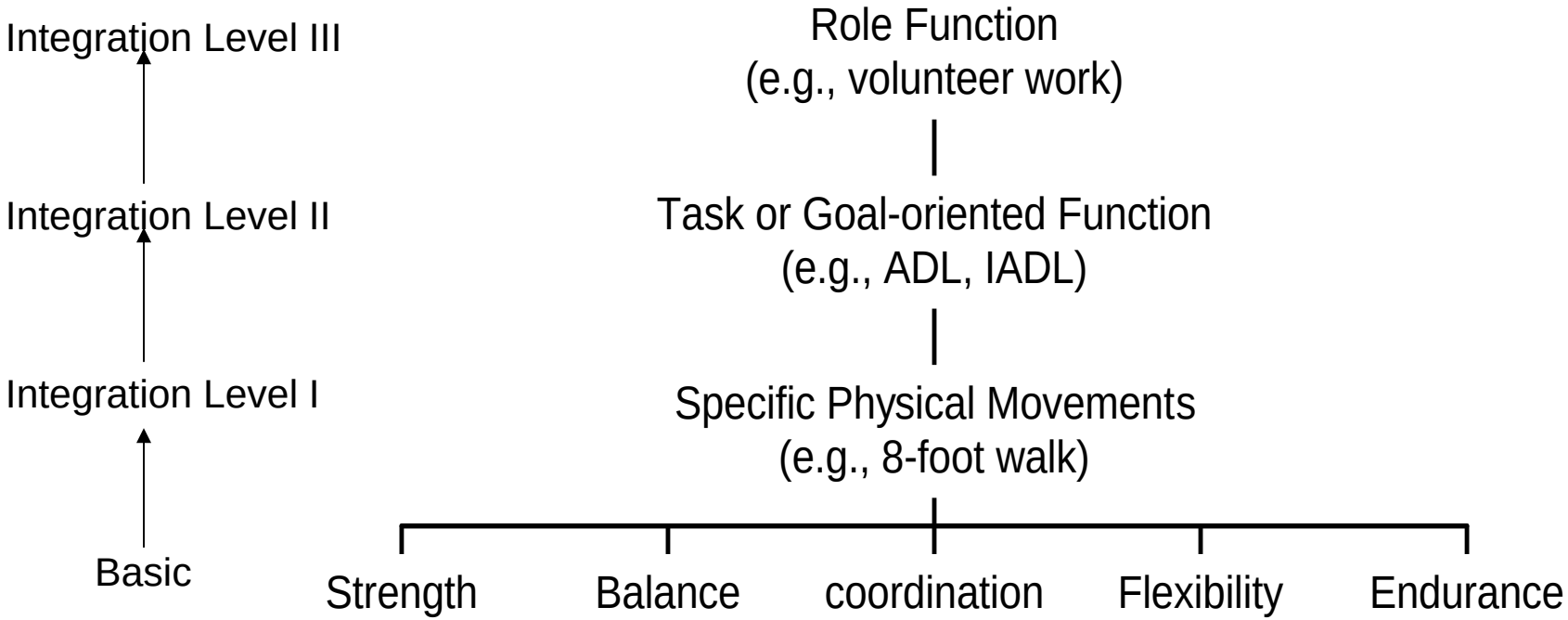

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Table 1. Calibration of "self-report" ADL and IADL items against actual performance tests.

Self-report Item	***Performance Test(s) – direct comparison***	***Performance – indirect/inferred comparison***
Activity of Daily Living (ADL)		
1. Transferring (bed to chair)		Grip strength, chair stands,
2. Bathing		Grip strength; manual dexterity; balance; leg strength; shoulder ROM
3. Dressing (zippers, buttons)	Put on and button coat/blouse, Pull on "scrub pants" while standing, Picking up small objects	Manual dexterity balance, chair stand, shoulder ROM
4. Personal grooming (wash face, brush teeth)	Buttoning coat	Grip strength, range of motion, pick up small objects
5. Eating (holding fork, cutting food, drinking)	Simulated eating, transferring beans with spoon	Grip strength; manual dexterity – pegboard, signature
6. Toiletting		Chair stand, grip strength, balance.
Other Items		
1. Walk across room (Rosow/Breslow)	Walking (able/unable; speed)	Walking (able/unable; speed)
2. Walk flight of stairs	Climb stair	Walking, chair stand
3. Lift 10 lbs (Nagi)	Lift 10lbs bag of water; Lift book to shelf	Grip strength, shoulder ROM

Table 1, continued. Calibration of "self-report" ADL and IADL items against actual performance tests.

Self-report Item	***Performance Test(s) – direct comparison***	***Performance – indirect/inferred comparison***
Instrumental Activity of Daily Living (IADL)		
1. Prepare own meals	prepare oatmeal in microwave	Grip strength, pick up small objects, balance *
2. Shopping for groceries, personal items		Walking, balance, lifting things *
3. Managing your money	Make change; balance checkbook	
4. Using telephone	Follow instructions use phone	Manual dexterity, grip strength
5. Doing heavy housework (scrubbing floors, washing windows)		Balance, chair stand, grip strength, leg strength *
6. Doing light housework (light cleaning, straightening up)		Balance, chair stand *
7. Getting places (outside of walking distance)		Walking, balance, vision, cognition *
8. Managing your medications	Implement standard physician instructions (written schedule and pillbox)	
9. Doing laundry		Balance, grip strength, lift things

Table 2. Examples of vignette strategy to compare health expectations and perceptions in China & Sri Lanka.

Vignette:	**Survey Question:**	**Response Ratings:**	**% China:**	**% Sri Lanka:**
Louis is able to move his arms and legs, but requires assistance in standing up from a chair or walking around the house. Any bending is painful, and lifting is impossible.	How much difficulty did Louis have with moving around?	None	6.5	6.5
		Mild	12.9	12.9
		Moderate	32.3	9.7
		Severe	32.3	48.4
		Extreme	16.1	22.6
Gemma has a brain condition that makes her unable to move. She cannot even move her mouth to speak or to smile. She can only blink her eyelids.	How much difficulty does Gemma have with moving around?	None	6.5	8.1
		Mild	1.6	8.1
		Moderate	1.6	3.2
		Severe	32.3	6.5
		Extreme	58.1	74.2
Adriana is quite active and does sports twice a week, such as tennis or swimming. Once a month, however, she is too tired for sports so takes a 3 km walk instead	How much difficulty does Adriana have with moving around?	None	74.2	58.1
		Mild	16.1	32.3
		Moderate	9.7	9.7
		Severe	0.0	0.0
		Extreme	0.0	0.0

Source: Salomon, J., Tandon, A., Murray, C., & World Health Survey Pilot Study Collaborating Group. *British Medical Journal, doi:10.1136/bmj.37963.691632.44* (published 23 January 2004)

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December 12, 2003 – Bethesda, MD

Agenda

8:00 - 8:30	Continental Breakfast	
8:30-9:00	Introduction – Purpose and Goals of Meeting Teresa Seeman, PhD *Richard Suzman, PhD*	
9:00 – 9:45	Overview of Available Physical Performance Protocols	*David B. Reuben, MD*
9:45 – 10:15	Discussion	
10:15 – 10:30	Morning Break	
10:30 – 11:15	Review of Performance vs. Self-report Measures of Physical Function *Linda Fried, MD, MPH*	
11:15 – 11:45	Discussion	
11:45 – 1:15	Lunch	
1:15 – 3:30	Group Discussion of Use of Protocols in Studies	

e.g., Health & Retirement, English Longitudinal Study of Aging, Mexican Health and Aging, Wisconsin Longitudinal Study

3:30-4:00 Wrap-up/Next Steps

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