

Within the field of aging, the conceptualization and measurement of functioning has been dominated by the disability model. In this paper, one limitation of that model is described by calling attention to a distinction between three “tenses” of functioning. Inadequate attention has been paid to the distinction between the capacity to function in the abstract (hypothetical tense) and actual performance in daily life (enacted tense). Failure to attend to this distinction has obscured considerable discordance between what people say they are able to do in standard functional disability assessments, and what they actually do at home. To illustrate this point, data from the MacArthur Studies of Successful Aging comparing the hypothetical to the enacted tenses are presented. These data show a consistent pattern of discordance between these two tenses.

Key Words: Functional status, Theory, Successful aging

Conjugating the “Tenses” of Function: Discordance Among Hypothetical, Experimental, and Enacted Function in Older Adults

Thomas A. Glass, PhD¹

Substantial discordance can be observed between the level of functioning older persons are capable of (based on self-reports), and how actively and independently they function in the “real” world. Recognition of this discordance has given rise to the distinction between pathology, impairment, disability, and handicap featured in the World Health Organization’s taxonomy of functioning, the International Classification of Impairments, Disability, and Handicap (ICIDH) (World Health Organization, 1980). This article argues that the WHO distinction has not gone far enough in sensitizing gerontologists to the complexity of late life functioning. This has resulted in a gap in conceptualization and research due to the failure to differentiate among three “tenses” of functioning (hypothetical, experimental, and enacted). This article presents a model to elucidate the distinctions among these tenses in an effort to fill this gap. Empirical evidence of the existence of this phenomenon will also be provided through a report on a data set which asks questions of high-functioning elderly persons from the perspective of more than one tense.

The Dominance of the Disability Model

For the past several decades, the predominant

conceptual scheme for thinking about functioning has been the disability model (Branch, Katz, Kniepman, & Papsidero, 1984; Clark, Stump, & Wolinsky, 1997; Hubert, Bloch, & Fries, 1993; Jette, 1987; Jette, 1994; Jette & Branch, 1985; Katz, Downs, Cash, & Grotz, 1970; Katz, Ford, Moskowitz, Jackson, & Jaffe, 1963; Lawrence & Jette, 1996; Nagi, 1965; Pinsky, Branch, Jette, Haynes, Feinleib, Cornoni-Huntley, & Bailey, 1985; Verbrugge & Jette, 1994; Verbrugge, Lepkowski, & Konkol, 1991). An indication of the importance of this model is the fact that the term disability has become nearly synonymous with the concept of functioning or functional status (McDowell & Newell, 1987). The disability model grew out of the work of Nagi in sociology (Nagi, 1965; Nagi, 1976; Nagi, 1991) and Katz and others in medicine (Katz et al., 1970; Katz et al., 1963) as an attempt to move beyond the narrow focus on the presence or absence of disease. Katz developed the activities of daily living (ADL) index to measure both the effectiveness of treatments and the underlying mortality risk in frail elderly populations. That the ADL index would become synonymous with functioning was foretold in the subtitle of Katz’s first article, “The index of ADL: A standardized measure of biological and psychosocial function” (Katz et al., 1963). Today more than fifty ADL scales have been developed and most, including the Katz and the Barthel Indices, were specifically intended to measure functioning among institutionalized patients (Mahoney & Barthel, 1965).

The disability model, as exemplified by the ICIDH, is pictured as a linear pathway leading from disease to handicap (in Nagi’s framework) (see Appendix,

¹The author would like to thank Drs. Rosalie A. Kane, Lisa F. Berkman, and Carlos Mendes de Leon for invaluable comments on an earlier draft. This work was supported by the Brookdale Foundation through the Brookdale Fellowship Program. Send all correspondence to Dr. Thomas Glass, Harvard School of Public Health, Department of Health and Social Behavior, 677 Huntington Ave., Boston, MA 02115. E-mail: tglass@hsph.harvard.edu

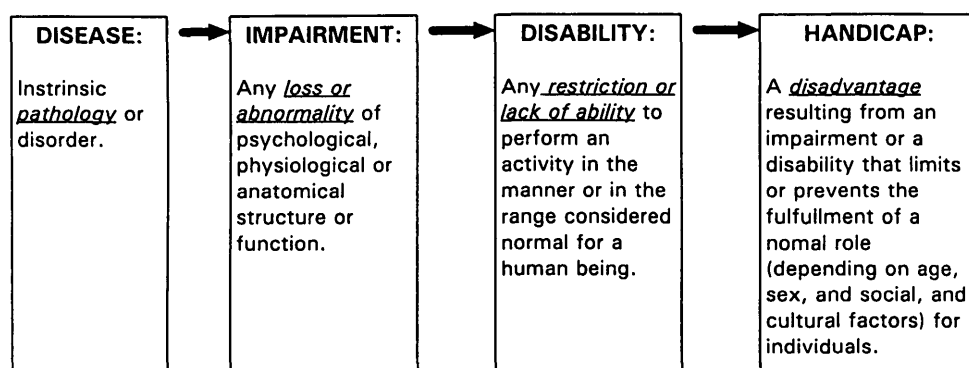


Figure 1. World Health Organization Typology of Health and Functioning: International Classification of Impairment, Disability, and Handicap (ICIDH).

Note 1). The emphasis is on the probabilistic rather than deterministic nature of those transitions (Figure 1). The model begins with disease (pathology), which predisposes to impairment (loss of structure or function), which predisposes to disability (restriction or lack of ability), and finally to handicap (disadvantage). Research which is informed by the disability model shares the idea that functioning should be understood in terms of functional capabilities in relation to the constraints placed on the individual by the outside world. In both its concepts and its measures, this model reflects an emphasis on functional ability as a hypothetical construct, rather than actual performance in daily life. As an example, in a recent test of the disability model using data from the Longitudinal Study of Aging, Lawrence and Jette (1996) excluded subjects who reported that they did not engage in ADL activities because "it was not possible to determine if they were abled or disable." This tendency to emphasize functional capability and to ignore functional performance reflects the history of the disability model as grounded in studies of functional status among older patients in hospitals and nursing homes, far removed from the real-world constraints which both enable and dampen functional performance outside of the institutional setting.

While the disability model continues to predominate the research and policy arenas, several important criticisms of this model have emerged. Among these concerns is that it remains focused on a narrow band of functioning, too closely linked to physical function and the presence of disease. Numerous researchers have sought to broaden the definition of functioning beyond the limited scope of self-care (ADLs). First among the revisions was instrumental activities of daily living (IADL), developed in the 1970s, which were designed to better capture domains of functioning among persons living in the community through the addition of domestic maintenance tasks (Lawton & Brody, 1969; Lawton, Moss, Fulcomer, & Kleban, 1982).

Motivated primarily by concerns over measurement problems, another group of researchers have argued for performance-based measures of functioning (Guralnik, Branch, Cummings, & Curb, 1989;

Reuben, Valle, Hays, & Siu, 1995; Tinetti, 1986). These measures have sought to minimize the difficulties arising from the use of self-reports, and are an attempt to move beyond the assessment of the hypothetical tense to which most standard self-reported ADL scales are limited. Yet, while the shift to performance-based assessments has been an important extension into the experimental tense, this has not lead to a generalized interest in performance outside the laboratory.

Still others have called for a broadening of our concepts of function toward social functioning (Bortz, 1989; Jette & Branch, 1981). Verbrugge and Jette (1994) have recently called for the inclusion of higher-level activities including social and leisure activity, trips, child care, and recreation. Other investigators have begun to examine productive activity as one dimension of higher-level functioning (Butler & Gleason, 1985; Glass, Seeman, Herzog, Kahn, & Berkman, 1995; Herzog & House, 1991; Kahn, 1986; Myers, Manton, & Bacellar, 1986).

A second area of criticism of the disability model has been that the emphasis on capabilities and difficulties has the unintended effect of removing the individual from the social and physical context in which functioning actually takes place. In this way, the measurement of functional status has resulted in a decontextualized view of functioning in older adults. As a result, there has been a tendency to de-emphasize compensatory strategies, work-arounds, and the various coping strategies employed by persons in their home settings. Feinstein, Josephy, and Well (1996) reviewed forty three indices of functional disability concluding that "... the most striking omission in indexes of disability is the absence of attention to the collaborative role of the patient. ... With uncommon exception, the roles of personal effort and external support are constantly overlooked ..." (p. 414).

Conjugating the Tenses of Function: Enacted Function Explained

According to Webster's dictionary, to conjugate a verb is to "recite or display all or some subsets of the inflected forms of a verb in a fixed order." The conjugation of a verb describes the different forms

of action as they relate to the temporal context of use. In linguistics, distinctions are drawn between past, present, and future forms of verbs. For the purpose of this article, a different type of conjugation is proposed in order to elucidate the meaning of functioning for the field of aging. For the purposes of this discussion, the idea of conjugation is not used in its temporal meaning (past, present, and future). Rather, the idea of conjugation refers to different aspects of what might be termed "action potential." The three tenses described below may each exist in past, present, and future forms.

Figure 2 provides a typology of how the concept of functioning might be conjugated in this manner. Traditional measures of functional status, as a consequence in part of the disability model, are primarily examples of the hypothetical tense. Subjects are asked a range of questions about whether they are able to perform tasks, how difficult those tasks might be, and whether they require help from people or from assistive technologies. In each case, the resulting answer is the product of the respondent's abstract calculus based, presumably, on that subject's ability to average across situations and contexts. This calculation is most often unmeasured and unobserved.

The second tense might be called the experimental tense in that instead of asking hypothetical questions about presumed ability, respondents are asked to demonstrate functional capability in a clinical (or experimental) setting. In the experimental tense, respondents are asked to simulate activities that are thought to be representative of true func-

tioning. As has been observed, this approach has the advantage of offering direct observation of the subject's ability and avoids some of the problems of self-reports. However, while this tense may adequately describe what a person is able to do under the inspection of the clinical examiner, it tells us little about the reality of that respondent's functioning at home. The experimental tense refers, then, to the demonstrated performance of what is hypothetically possible, albeit subject to the conditions and limitations of the experimental setting.

A third tense, referred to here as the enacted tense, refers neither to hypothetical ability nor to what the individual is able to perform under special and circumscribed conditions. Instead, enacted function refers to the functional performance realized by an individual within the home context. Enacted function, whether physical, cognitive, emotional or social, refers to the end result of the confluence of situational and ecological factors which shape the moment to moment performance of functional tasks in the real world. As such, enacted function is a lower level of abstraction. It requires no abstract calculus of what is possible, but requires instead the accurate recollection of what has been or is now.

The central argument of this article is that within the field of aging, the study of functioning has focused almost exclusively on just one tense. We have conceptualized functioning in terms of the individual's capacity in the abstract, rather than what that individual is doing now or has actually done in the past. Researchers have constructed tests which assess the capability or difficulty of certain actions,

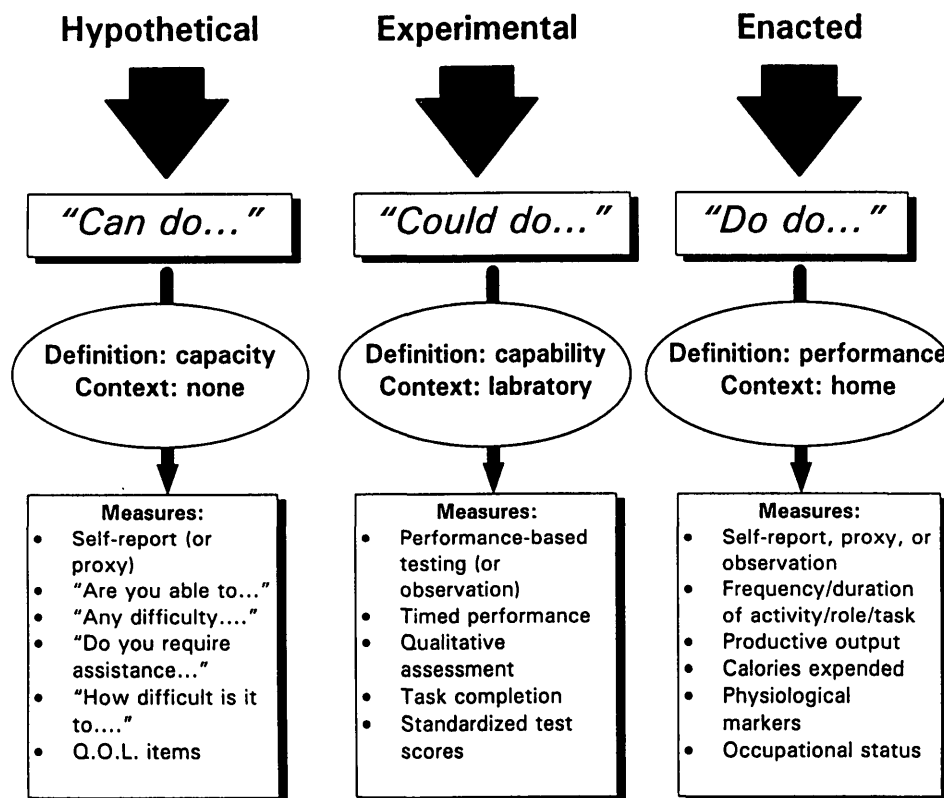


Figure 2. Conceptual scheme for conjugating the tenses of functioning.

but exclude the question of whether those actions are actually performed. In short, a conceptual framework has emerged within gerontology based on the hypothetical rather than the enacted tense of function. Further, the predominant measurement tools in common use in the field reflect and are driven by this framework.

The usefulness of this approach to conceptualizing function is not to argue that any one perspective is inherently superior to the others. In fact, the very quality that makes one tense better suited to one application may be its weakness in another. For example, Guralnik and colleagues (1989) correctly assert that one advantage of performance-based measures (experimental tense) over ADL scales (hypothetical tense) is that the former are less influenced by "cognition, culture, language, and education." However, in another research context, these same factors may be of primary interest. If an investigator wishes to research how factors such as language, culture, education, cognition, social support, or other host characteristics impact levels of functional performance, measures based on either the hypothetical or the experimental tense may be insufficient. All three tenses may represent different and independent ways in which individuals think about functioning. If that is true, gerontologists need to develop parallel and complementary measurement tools to accommodate those perspectives.

To a large extent, these alternatives already exist. Any standard textbook on questionnaire design will include a discussion of how question construction impacts the resulting data that is generated (this was pointed out by an anonymous reviewer of an earlier draft of this paper). Research on functioning, as well as public policy, however, continues to rely almost exclusively on the hypothetical tense. Only recently have attempts to further elucidate the experimental tense become widespread. Rarely has this led to extensive investigation of the enacted tense. The purpose of this article, moreover, is to draw out the importance of the distinction among the three, and to make a case for the importance of the enacted tense.

Emphasis on the hypothetical tense has produced considerable progress in the field. The ADL disability scales were designed to capture gross departures from optimal functioning for purposes of predicting those at increased risk for nursing home admission or death (Applegate, Blass, & Williams, 1990). Most of these scales, including Katz, the Barthel index, and the original PULSES scales were developed for use among hospitalized patients (Wagner, 1987). In the hospital setting, the hypothetical nature of these instruments is clearly more appropriate; although as several commentators have noted, the emphasis ought to shift to actual performance of functional tasks as the patient moves from the hospital to home (Fuhrer, 1987). As a predictor, rather than as an outcome, the disability indices are well suited to this task.

Traditional disability scales also have advantages for public policy because they allow for the identi-

cation of environmental barriers and impediments more easily. As a basis for deciding who is eligible for health or social services, it may be best to exclude the contingencies of the home environment, or at least to minimize their influence as a way of ensuring equity in resource allocation. In this sense, asking subjects if they are able to perform a task in the hypothetical allows us to separate, or to hold constant, the complexity which arises from the introduction of the social, physical, and cultural contexts that shape and modify actual performance.

A Graphical Representation of Two Tenses

To further illustrate the importance of this distinction, Figure 3 depicts a simple 2-by-2 table which contrasts the hypothetical tense (functional capacity), as measured by most commonly used ADL scales, with the enacted tense. Enacted function refers to the extent and quality of functional performance realized by an individual within a particular socio-physical context. Individuals who fall on the diagonal (Types I and IV) may be said to be concordant between the hypothetical and enacted tenses of functioning. For these individuals, ADL scales would be valid and reliable measures of both functional capability and actual performance. The term actual performance here refers to functional performance within a naturalistic social setting, as contrasted to performance achieved in a clinical setting or under experimental conditions.

Types II and III, on the other hand, represent a substantial measurement challenge that has seldom been explicitly addressed in aging research. Type II individuals enact high levels of functional performance despite significant difficulty, disability, or diminished capacity. The reasons for this discordance are many, and are not well understood. These individuals might be thought of as "over-achievers" in the sense that within the context of their home environment, they are functioning at a higher level than that which they are presumed to be capable. Type III individuals, on the other hand, actually function at

		Functional performance at home (Enacted "tense")	
		Low	High
Functional capacity (Hypothetical "tense")	Low	Type I <i>Low functioning</i>	Type II <i>Over-achievers</i>
	High	Type III <i>Under-achievers</i>	Type IV <i>High functioning</i>

Figure 3. Cross-classification of "hypothetical" and "enacted" tenses of functioning.

lower levels than would be predicted by ADL scales. Despite the absence of limiting factors such as disease, impairments, or disability, these individuals do not actually perform the tasks about which they are being asked. These "under-achievers" may lead sedentary, immobile lives, and potentially are quite dependent on others. Again, the reasons for this discordance are numerous.

Evidence from Previous Research

While a general awareness of this issue can be seen throughout the literature on functioning, very few investigators have studied the problem directly. This author's own interest in this phenomenon was catalyzed during qualitative interviews with surviving members of the New Haven EPESE cohort. Among them was a gentleman in his late 80s who reported a high level of ADL impairment, yet spent most of his days sailing his boat up and down the Connecticut river. When asked about how he maintained the boat, he demonstrated how he would use duct-tape to affix a paint brush to his cane to apply a new coat of paint to his boat every Spring. Equally common was the story of a woman in her 70s who reported that she was able to do everything for herself, while maintaining that all she really did was watch television all day while her 60 year old son with congestive heart failure "waited on her hand-and-foot." During these interviews, it became increasingly clear that it is an error to assume that functional capacity and performance are the same.

Several commentators have noted the lack of studies which investigate the reliability and validity of functional disability measures in general (McDowell & Newell, 1987). Beyond these general criticisms, a number of researchers have noted a difference between functional capacity and performance (Hickey, 1980; Jette, 1994; Kelly-Hayes, Jette, Wolf, D'Agostino, & Odell, 1992; Patrick, Darby, Green, Horton, Locker, & Wiggins, 1981; Verbrugge & Jette, 1994; Ziebland, Fitzpatrick, & Jenkinson, 1993). For example, some evidence suggests that those who report impaired capacity in one or more domains are simultaneously quite active and high-functioning in other domains which are assumed to require high degrees of capacity. In a study of religious participation among members of the New Haven EPESE cohort, Idler (1987) concludes that ". . . functional disability does not entirely determine behavior: 98 of the sample's 358 severely disabled women (who reported that they needed assistance in crossing a room, feeding themselves, bathing, etc.) also report a frequency of attendance at services of once a week or more often." Miner, Logan, & Spitz (1993) also found that functional disability is unrelated to frequency of attending senior centers. Findings from the Health Insurance Study (HIS) have shown that some subjects who report limitations in physical activity report no corresponding limitations in role activities (Stewart, Ware, & Brook, 1981). In each case, these findings were seen as anomalies, and were not interpreted as signs of the weakness of a more general model of functioning.

In their influential study of the correlation among self-reported, interviewer-administered, and performance-based testing of functional abilities, Reuben et al. (1995) found the relationships to be "inconsistent and weak, suggesting that these instruments are not measuring the same construct." It is possible that differences between self-reports, interviews, and performance testing reflect more than measurement error. They may also reflect differences in the meanings of different questions asked in various ways. Several investigators have shown that subjects will tend to interpret questions about functioning in ways that are often different than what researchers intend (Keller, Kovar, Jobe, & Branch, 1993), and that the same subjects within the same disease group, who are given different disability questionnaires, will evidence substantially different levels of disability (Ziebland et al., 1993). These discrepancies may also reflect the inherent unreliability of asking questions in the hypothetical tense (Anderson, Bush, & Berry, 1989). They also reflect, in part, differences in the "tacit models" (Ziebland et al., 1993) which underlie the construction of disability instruments.

The few studies that have examined multiple tenses suggest that reduced function in the enacted tense may be more prevalent than is observed in the hypothetical tense (Type III discordance). In a recent study, Kelly-Hayes et al. (1992) used Nagi's distinction between functional limitation (capacity) and disability (closest to enacted) to look at data from the Framingham study. Their findings suggest substantial discrepancies between the two and, in most cases in which differences were observed, respondents reported a disability (enacted tense) and not a functional limitation (hypothetical tense). In addition, they found that psychosocial factors were more strongly associated with disabilities than they were with limitations. This last finding is important because it suggests that the impact of psychosocial factors may be greater in determining the enacted rather than hypothetical tense of function. This observation is supported by Mendes de Leon et al. (1996) who studied both the experimental tense (physical performance) and the hypothetical tense (ADL questions) over time and found the relationship to be mediated by self-efficacy.

In another study, Patrick et al. (1981) looked at data from two community surveys of a London borough and found considerable differences across the two waves based on what they termed "capacity wording" versus "performance wording" of their disability questions. In the study that used the performance wording (enacted tense), investigators found as much as a two-fold increase in the prevalence of disability, leading the authors to suggest that studies based on capacity wording may substantially under-estimate the true prevalence of disability in populations. A similar conclusion was reached by Anderson et al. (1989) who found that "capacity wording" of questions produced an under-reporting of dysfunction of at least 10%. Based on the studies by Patrick, Kelly-Hayes, Anderson, and

others, it is likely that discrepancies between the two tenses of function may be substantial, and that reliance exclusively on instruments which assess only the hypothetical tense may lead to biased estimates of disability rates as well as an underestimation of the importance of psychosocial factors in late-life functioning.

Three Examples of Discordance: Data From the MacArthur Studies of Successful Aging

We now turn to an empirical example that illustrates the importance of what has been argued so far. In order to estimate the magnitude of discordance between reported capacity and actual functional performance, we would ideally choose data that were drawn from a randomly chosen and community-based study of the elderly. We would hope to have indicators of functional capacity and enacted functioning that would be sensitive to higher-level activities as well as gross impairments and disability in the physical domains. And, we would hope for measures of both capacity and actual performance that were directly observed or performance based (on both counts) rather than self-reports alone. Data that meet all of these criteria are currently unavailable. However, for the purpose of illustration, data from the MacArthur Studies of Successful Aging have several important advantages. First, although not intentional, the MacArthur battery asked two sets of questions about several domains of function in both the hypothetical and enacted tenses. First, traditional functional disability questions were asked about the extent to which the respondent feels that they are able to accomplish a task. Then, much later in the interview, under items which are part of a battery of productive activity questions, subjects were asked whether and how often those same tasks were actually performed. These data then afford the opportunity to explore the extent of discordance between the hypothetical and the enacted tenses of functioning. It should be stressed that while these data offer a rich opportunity to estimate the magnitude of concordance or discordance, the MacArthur study was not designed to investigate this question and there are several notable limitations associated with these data. For example, both sets of questions are self-reports and are therefore subject to the problems associated therewith.

Aging researchers have begun to study productive activities — or those activities which generate goods and services of economic value — as a marker of “successful” aging (Cutler & Danigelis, 1993; Glass et al., 1995; Herzog, Antonucci, Jackson, Kahn, & Morgan, 1987). For the purpose of this study, questions about productive activity are good indicators of enacted functioning because they ask the frequency and duration of routine activities as they were actually performed. Productive activity is also an ideal indicator of global enacted functioning because it represents high-level functioning which requires performance in the social, physical, and cognitive domains.

Methods

Subjects

The data used in these analyses are from the MacArthur Research Network on Successful Aging Field Study, a longitudinal study of high functioning men and women aged 70–79. Details of the study design are available elsewhere (Berkman, Seeman, Blazer, Kahn, Mohs, Finch, Schneider, Cotman, McClearn, Nesselroade, Featherman, Garmezy, McKhann, Brim, Prager, & Rowe, 1993). Subjects were drawn from three sites of the Established Populations for the Epidemiologic Studies of the Elderly (EPESE): Durham, NC; East Boston, MA; and New Haven, CT. Men and women aged 70–79 were selected on the basis of physical and cognitive function at the time of their 1988 EPESE interview. Age-eligible men and women ($N = 4,030$) were screened on the basis of six criteria to identify a relatively “high functioning” cohort, representing approximately the top third of their age peers in terms of physical and cognitive function. Of the 1,313 subjects who met all criteria, 1,192 (90.8%) agreed to participate and provided informed consent. Baseline data collection was completed between May 1988 and December 1989 and included a ninety minute, face-to-face interview covering detailed assessments of physical and cognitive performance as well as information regarding health status. A three year follow-up interview was conducted in 1991. However, this study uses only data from the baseline interview.

For comparison purposes, a smaller subsample of subjects was interviewed at baseline ($n = 163$) who were chosen to represent the middle and low tertiles of functioning using the same criteria. This group was chosen to permit comparisons with the high functioning subjects in order to determine those physical and psychosocial factors that discriminate “successful” from “usual” patterns of aging. The medium and low functioning groups were not re-interviewed at follow-up.

Measures

Features of the data collection and sampling strategies for the EPESE studies have been well described regarding sociodemographic characteristics (Cornoni-Huntley, Ostfeld, Taylor, Wallace, Blazer, Berkman, Evans, Kohout, Lemke, Scherr, & Korper, 1993). Variables used in these analyses include age, sex, race, and marital status. Age was recorded as of the date of the subject's 1988 MacArthur interview, and is dichotomized in these analyses (0 = 70–74, 1 = 75–79). Marital status is also dichotomized (1 if married at baseline, 0 if not).

Our objective in this study was to cross-classify indicators of functioning across two distinct tenses. To accomplish this goal within the limitations of the MacArthur data, three comparisons were made using data from questions both about hypothetical and enacted tenses. Functional disability scales included in the MacArthur battery include a 7-item

measure of limitations in activities of daily living as developed by Katz et al. (1970), a measure of gross mobility based on the work of Nagi (1976), and a self-reported measure of physical performance (Rosow & Breslau, 1966), all of which use wording that reflects the hypothetical tense. Among high-functioning respondents, there was no variance on the Katz ADL index, and only limited variance on the Nagi and Rosow-Breslau scales (see Appendix, Note 2).

First, we focused on two items from the Rosow-Breslau index which include: 1) "Are you able to do heavy housework like washing windows, walls, or floors without help?" [coded yes, no, or refused]; and 2) "Are you able to walk 1/2 mile without help?" [coded yes, no, and refused]. For the third comparison, summary indices of potential versus enacted tenses were used, including self-reported limitations in ability to function in either the Nagi and the Rosow-Breslau scales and a summary index of productive activities (enacted tense).

To measure enacted function, or the level of functional performance as realized by each subject in their home, 18 items from the productive activities battery developed by the MacArthur Successful Aging network in conjunction with colleagues from the Americans Changing Lives study (Herzog, Kahn, Morgan, Jackson, & Antonucci, 1989). For our first two comparisons, individual items from the productive activity battery which paralleled items from the Rosow-Breslau scale were used, including questions which asked "Do you currently do any heavy housework?" and "Do you walk at least 1/2 city block per day?" [both items coded yes, no, refuses, don't know]. For the third comparison, a summary index of productive activities developed in an earlier study was used (Glass et al., 1995). This scale combines information on five dimensions of productive activity chosen to represent the activities commonly engaged in by older people which produce economic goods or services including: 1) housework, 2) yard work, 3) child care, 4) paid work, and 5) volunteer work. In the present study, the summary index was divided into tertiles for the high-functioning group, as well as the medium- to low-functioning comparison group.

Results

Table 1 shows the socioeconomic and selected functional characteristics of the two in total as well as by gender. In comparing the high-functioning sample (labeled successful agers in the MacArthur study) to the medium- to low-functioning group (usual agers), the high-functioning group, as expected, is younger, less likely to be of minority descent and less cognitively impaired. With the exception of a difference in education among women, the two groups are not notably different in education or income. Among the high-functioning group, women were more likely to be married. In both groups, just over half (55%) of the sample is female.

The results of the three comparisons between hy-

pothetical and enacted function are presented in Tables 2, 3, and 4. In Table 2, the ability to perform heavy housework is cross-tabulated with the actual performance of heavy housework. Note that the data are presented for the high-functioning group (HF) and the medium- to low-functioning group (MLF) separately. Only 6% of the HF group say they are not able to do heavy housework. Of that group,

Table 1. Comparison of "Successful" and "Usual" Agers on Demographic Features: Means, Frequencies and Percentages with Statistical Tests of Difference^a

Variable	High functioning (N = 1191)	Mid-low functioning (n = 162)	Test ^b	Sig.
Sex				
Men	531 (45%)	73 (45%)	n.a.	
Women	661 (55%)	89 (55%)	n.a.	
Race (non-white)	228 (19%)	55 (34%)	19.0	.000
Men	92 (17.3%)	21 (29%)	5.52	.019
Women	136 (20.6%)	34 (38%)	14.0	.001
Marital Status (% married)	564 (47.4%)	62 (38.3%)	4.77	.029
Men	367 (69.2%)	46 (63.0%)	1.16	.283
Women	197 (29.9%)	16 (18.0%)	5.43	.020
Age	74.3	75.0	3.29	.001
Men	74.1	75.0	2.46	.014
Women	74.4	75.1	2.21	.028
Education (highest completed)	10.6	9.8	-0.99	.321
Men	10.7	10.8	0.10	.921
Women	10.6	8.9	-4.93	.000
Income (categorical)	13.7	15.7	0.78	.439
Men	13.4	15.1	0.48	.633
Women	14.0	16.2	0.68	.498
Cognitive Status (Pfeiffer)	8.2	7.3	-6.67	.000
Men	8.2	7.4	-4.23	.000
Women	8.1	7.3	-5.17	.000
Index of Productive Activity	6.7	4.8		

^aMeans presented for continuous variables, frequencies, and percents for categorical variables.

^bT-tests are shown for continuous variables and chi-square tests for categorical variables.

Table 2. Discordance Between Hypothetical and Enacted Functioning: Heavy Housework (1988)^a

		Do you do any heavy housework?		
		No	Yes	Totals
Are you able to do heavy housework?	Type I			
	No	highs 40%	highs 60%	73 (6%)
	lows 56%	lows 38%	84 (52%)	
	Type III			
Yes	highs 07%	highs 93%	1110 (94%)	
lows 23%	lows 77%	78 (48%)		

^aMacArthur Studies of Successful Aging, 1988 (Highs = 1,183, Medium-Lows = 162).

Table 3. Discordance Between Hypothetical and Enacted Functioning: Walking City Blocks (1988)*

		Do you walk at least 1/2 of a city block per day?		
		No	Yes	Totals
Are you able to walk 1/2 mile without help?	No	Type I highs 35%	Type II highs 65%	37 (3%)
		lows 60%	lows 40%	
	Yes	Type III highs 15%	Type IV highs 85%	1104 (97%)
		lows 24%	lows 51%	104 (67%)

Table 4. Discordance Between Hypothetical and Enacted Function: Disability and Productive Activity

		Tertile of Productive Activity?			
		Low	Medium	High	Totals
Any functional limitations	3+	highs n.a. lows 32%	highs n.a. lows 37%	highs n.a. lows 31%	n.a. 78 (48%)
	1-2	highs 41% lows 41%	highs 32% lows 27%	highs 27% lows 32%	304 (26%) 44 (27%)
	0	highs 30% lows 28%	highs 33% lows 30%	highs 36% lows 43%	888 (75%) 40 (25%)

Note. Percentages do not add to 100 due to rounding.

however, 60% report later in the questionnaire that they do perform heavy housework. Among the MLF group, just over half say they are not able to do heavy housework, while 38% of that group reports that they do heavy housework. Conversely, among those who said that they were able to do heavy housework, 7% of the HF group and 23% of the MLF group reported that they, in fact, did not do any heavy housework.

Table 3 presents results of a similar analysis for walking. In this case, the wording of the two questions was not exactly the same. Here we contrast those who said they were or were not able to walk one-half mile without help, with those who walk at least one-half city block per day. Among the HF group, only 3% said they were not able to walk one-half mile without help. Among that group of 37 respondents, 65% said they walk one-half city block per day. Among the MLF group, 40% of those who said they are not able to walk one-half mile, reported that they did walk at least one-half city block each day. Among those who said they are able to walk one-half mile, nearly one-quarter walk less than one-half city block per day.

Finally, Table 4 presents a similar analysis which looks at any self-reported impairment in the hypothetical tense with a summary index of enacted function. We contrast those who report 0 versus 1-2 versus 3 or more functional limitations (Nagi or Rosow-Breslau), with the index of productive activities broken into tertiles. In first looking at the diagonal cells of the Table, a consistent pattern is visible.

Approximately one-third of the sample of both high- and low-functioning groups report hypothetical and enacted tenses which are consistent with one another. Again, however, our focus is on the off-diagonal cells of the Table. Among those HF who report 1-2 functional limitations, nearly one third (27%) performed in the highest tertile of productive activity. Similarly, among those with no limitations, 30% are in the lowest tertile of productivity. Among medium- to low-functioning respondents, 31% are in the highest tertile of productivity despite reporting three or more functional limitations. Finally, 28% of those with no limitations are among the least productive subjects.

Discussion

The purpose of presenting these data has been to call attention to the possibility of substantial discordance between answers to questions about functional capacity and actual performance in the home context. A thorough and comprehensive examination of this discordance is beyond the scope of these data and this study. These data are clearly not without limits. However, although others have pointed out the importance of question design in studies of functional status (Anderson, Bush, & Berry, 1989; Hickey, 1980; Kovar, 1991; Robine, Michel, & Branch, 1992), few investigators have taken seriously the idea that functional performance may be as important as functional capacity. In the absence of better data, these analyses suggest a relatively consistent picture. Across multiple comparisons, the degree of discordance between hypothetical and enacted tenses of function appears to be between the range of 25% and 35%. That is, many older persons appear to be both overachieving and underachieving in their functional performance relative to self-reports of functional capacity as measured by standard indices. This discordance appears to be relatively symmetrical in that the magnitude of overachieving roughly matches the magnitude of underachieving. This suggests that failure to include separate assessments of performance may lead to considerable misclassification and measurement error.

Why Does This Matter?

Is the distinction between hypothetical, experimental, and enacted tenses simply a linguistic trick, or are the implications of this argument important? Is there anything here beyond simple measurement error? In the remainder of this discussion, eight reasons for the significance and importance of this phenomenon are presented.

Missing Information. — Social and behavioral scientists have increasingly moved toward a broader and richer conception of aging. The new themes have been heterogeneity, fluidity, adaptation, modifiability, and "successful aging" (Berkman, 1988; Maddox, 1987; Rowe & Kahn, 1987). From large-scale epidemiological data sets, much has been learned

about the plasticity of human aging. Old notions of aging as an inevitable process of decline and loss of capacity are being replaced. Many of these ideas confirm and reiterate the conventional wisdom that as we age, the mind matters. Regrettably, the development of new multidimensional instruments for the assessment of global functioning in all its facets has lagged behind. Instead, aging researchers have relied on measures designed in the 1960s largely for clinical purposes, which are based almost exclusively on the hypothetical tense. Designed to capture the physiological substrata underlying functional status, these instruments have been less successful at capturing how elderly people are actually functioning in their daily lives. As a result, a rigorous assessment and subsequent investigation of the contribution of psychosocial factors to functioning has been lacking. A new sensitivity to the importance of multiple tenses of functioning is needed as well as new and innovative tools for disaggregating those tenses.

Will the Real Disability Please Stand Up? — It is widely recognized that the definition and measurement of disability has a profound impact on the rates of disability observed in a given population. For example, Jette (1994) shows that wording based on “difficulty” as opposed to the need for “human assistance” resulted in disability estimates that were 1.2 to 5 times greater. Given the importance of wording, it may be especially important to measure actual performance of self-care tasks independently of difficulties and help, both human and non-human. And while some studies clearly focus appropriately on the identification of impairments at the hypothetical tense, it may be equally important to begin to recognize that what really matters most, both in relation to quality of life, and as a true marker of underlying risk of poor outcome, is not what people can do, but what they *do* do.

Evaluation of Interventions: A Better Mousetrap. — The main goal of health interventions is the optimization or restoration of the actual, functional performance of life activities. As Kane and Kane (1987) observe, “If long-term care is directed at improving or maintaining functioning, then its success can be measured by functional outcomes” (p. 107). Yet, our evaluation tools often pertain only to whether help is needed, not whether it is received; whether difficulties are encountered, not whether they are overcome; and whether performance is possible, not whether it is achieved. By definition, outcome measures which tap into performance will be more appropriate and definitive than those that ask only about the hypothetical ability to function. The reverse is also true. As observed by Anderson et al. (1989), “Treatment programs should not take credit (and resources) for restoring function that does not exist.” (p. 15). Interventions which do not translate reductions in capacity into corresponding increments in performance are clearly less effective than those that do.

In addition, interventions targeted at the enacted tense may require different strategies and approaches. As the work of Mendes de Leon and others have shown (Mendes de Leon, Fillenbaum, Williams, Brock, Beckett, & Berkman, 1995), attention to issues such as self-efficacy may be necessary in order to translate the benefits of increased capacity into the ultimate goal of increased function as realized in the residential context.

The Underestimation of Life-Context. — In addition to the survey data shown here, this research is based on in-depth interviews conducted by the author in an effort to determine the meanings of various types of questions about functioning and their relation to quality of life in late life. As a consequence of this qualitative work, it became increasingly clear that functional performance is substantially shaped by the social and cultural context of the home-world and that functioning cannot be understood in the absence of that context (Glass, 1991; Keith, 1985, 1988). However, because aging research has relied so heavily on large-scale survey studies that include little information about that social context data, it is perhaps not surprising that the field has tended to underestimate its importance (Kasl, 1995). By integrating qualitative data collected in naturalistic settings with large scale survey data, a level of richness and insight can be achieved which is lacking when either type of data is examined alone. In many interviews, subjects answered questions about the hypothetical tense, then gave much different answers when asked to describe what they actually did. There exists a need for more qualitative studies of functioning in the real world which explore explicitly the different tenses of function and how discrepancies are understood as meaningful by older persons.

Compensatory Strategies. — Aging specialists have long recognized that older persons cope differently, and vary in their use of compensatory strategies and technologies in dealing with the challenges of late life. The concept of compensation is particularly important for identifying factors which help disabled persons overcome those challenges and avoid the handicaps that can result. Forms of compensation might include substitution of goals, slower timetables, help from equipment or from others, environmental modification, avoidance of hazard, or even greater effort. The concept of compensation is appealing if for no other reason than it casts the disabled person in a heroic light. However, to the extent that enacted function is not measured independently of the hypothetical tense, it becomes nearly impossible to fully explore the impact of these compensatory strategies. It may be argued that the discordance observed in these data represents little more than the effects of these various strategies (i.e., help from people or specialized equipment). Certainly the need to perform productive activities depends on more than the ability to do so, but also on the need to produce as dictated by one’s socio-

conomic resources. It is possible that the failure to measure the two tenses separately has led to a systematic myopia, whereby the real importance and significance of those types of help may be substantially underestimated.

Determinants of Under and Over Achievement. — It is not a novel observation that some elders seem to overcome seemingly extraordinary challenges, while others appear to be devastated by only minor disabilities (Hickey, 1980). This observation should be obvious and compelling to clinicians, as it is to anyone who has known a “super” grandparent. However, the disability model, which ends with handicap, leaves off prior to the endpoint of actual performance within broad functional domains. As such, we currently lack the tools, both methodologically and conceptually, to study those factors most closely associated with these two discordant types. What are the factors that are associated with overcoming impairments among those living in the community? What are the factors which are associated with low levels of enacted function, despite the relative absence of disease or disability? This may be an especially important risk group as is indicated by studies showing the deleterious consequences of inactivity (Hartley, 1985; Kannel, Belanger, D’Agostino, & Israel, 1986; Kiely, Wolf, Cupples, Beiser, & Kannel, 1994; Lee & Markides, 1990; Leon, 1985; Paffenbarger, Hyde, Wing, & Hsieh, 1986; Simonsick, Lafferty, Phillips, Mendes, Kasl, Seeman, Fillenbaum, Hebert, & Lemke, 1993). By developing new tools for the assessment of enacted function, the capability to address these questions will be substantially enhanced.

Differential Discordance Across Age Categories. — There is evidence that the discrepancies between hypothetical and enacted tenses may be greater in older people than in younger people. That is, measures based on the hypothetical tense alone may be especially poor markers of actual functioning in older populations, therefore leading to unwarranted conclusions about the prevalence of dysfunction. For example, in a study of stroke recovery Ferrucci and his colleagues (Ferrucci, Bandinelli, Guralnik, Lamponi, Bertini, Falchini, & Baroni, 1993) looked at the relation between motor impairment (an index of functional capability as it relates to the stroke’s severity) and functional performance (measured using the Barthel Index of ADL). Their findings, based on a prospective study of 50 first-time stroke survivors, show that motor impairment predicts most of the recovery that is observed among younger people (<65), while older subjects were “more likely to employ compensatory strategies to overcome some of the neural impairment that remains after stroke” (p. 200). Older persons kept pace with the recovery of younger persons in terms of enacted function, despite demonstrating significantly less improvement at the motor level. Studies such as this one suggest that the need to look at enacted and hypothetical function independently may be more acute among the oldest old.

A Strategy for Measuring Successful Aging. — Research in aging over the last decade has emphasized population heterogeneity and a widening of the scope of factors thought to determine functioning (Maddox, 1979, 1987). The distinction between “successful,” “normal,” and “pathological” patterns of aging is now widely recognized (Baltes & Baltes, 1990; Berkman, 1988; Roos & Havens, 1981; Rowe & Kahn, 1987; Rudinger & Thomae, 1990). Yet, the concept of successful aging has not been fully translated into operational measures and testable hypotheses, with some notable exceptions. The distinction between hypothetical and enacted function may be a key to further specifying (and measuring) the mechanisms underlying successful aging. In this study, discrepancies were observed between what respondents say they are able to do, and how they actually perform. The observation of these discrepancies is especially important among a cohort of older subjects who were selected to be homogeneous and high-functioning. Many of the psychosocial factors that have been linked with successful aging including social networks and supports, resiliency, personality characteristics, motivation, and self-efficacy may be more closely associated with enacted function than with its more hypothetical forms. A new method of measuring enacted function will create additional avenues for the empirical study of successful aging beyond what has yet been achieved.

Conclusions and Implications

This article has proposed a conceptual model to describe and understand differences between functional capacity and actual functional performance in the home. Although the importance of the wording of survey questions is commonly recognized, the development and implementation of new measures of enacted function have lagged. Gerontological research has remained focused on standard measures of function which are limited to the assessment of capability (hypothetical tense). The absence of independent measurement of the separate tenses of function may lead to misclassification of risk, measurement error, and a gap in research on the importance of psychosocial factors and compensatory strategies. It has been argued that the distinction among hypothetical, experimental and enacted function is more than semantic, and more than a technical detail of question design, but addresses the ways in which the field of aging has tended to conceptualize functioning and how the history of the field informs our understanding of that conceptualization. Several empirical examples were provided from the MacArthur Studies of Successful Aging which suggest a consistent pattern of substantial discordance between the hypothetical and enacted tenses of functioning. The full extent of, and explanations for, these discrepancies remain poorly understood and, in large part, masked by the concepts and measures currently in wide use.

The implications of this argument for researchers, interventionists, and policy makers are potentially

far-reaching. Research is needed to compare independent assessments of the three tenses of function. This will require the development of additional measurement tools specifically designed to capture enacted function to complement established methods for the assessment of disability (hypothetical tense) and physical performance (experimental tense). Measures of enacted function could be developed in both self-report and observer-rated formats. In either case, these new measures must be designed to capture functional performance in the home setting, and must be sensitive to both the frequency and duration of functional performance. These new measures may be quite useful for designers of interventions. As an outcome, enacted function can be used to assess the efficacy of interventions more precisely because in tapping actual performance, rather than just capability, they capture the complex influences of the social and physical milieu, all of which are relevant to the ultimate efficacy of any intervention. In the policy domain, many programs utilize standard ADL scales to determine eligibility, despite evidence which suggests that "capacity wording" leads to underestimation of the true extent of functional difficulties (Anderson, Bush, & Berry, 1989; Kelly-Hayes et al., 1992; Patrick et al., 1981). The addition of separate measures of enacted function would allow for more valid and reliable estimation of true disability in populations, and would lead to the identification of under-served groups. Finally, dual assessments of hypothetical and enacted function will identify the prevalence of discrepant patterns II and III (over- and under-achieving) which constitute, in one case, an important new category of risk and, in the other case, an important new phenomenon for study. In short, much can be learned from those individuals for whom assessments of how they might function and how they do function do not coincide.

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Received December 18, 1996
Accepted June 20, 1997

Appendix

Notes

1. There are minor differences in the language used by different authors in the disability tradition. Where Nagi uses the terms "disability" and "handicap" (Nagi, 1965), Verbrugge and Jette use instead the terms "functional limitations" and "disability" (Verbrugge & Jette, 1994).
2. Subjects were considered to be high-functioning if they met several criteria including a) no disability on the Katz ADL scale, b) not more than one disability item on either the Rosow-Breslau or Nagi scales of gross mobility and physical performance, and c) a score of 6 or higher on the 9-item test of cognitive performance developed by Pfeiffer.