AGE AND FUNCTIONAL HEALTH STATUS

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Age and Functional Health Status

Abstract

The relationship between age and functional health status is examined in two cross-sectional studies: (1) a random household sample of 2008 adults and (2) a sample of 1227 ambulatory patients in northern New England. Results reveal diminished and more variable physical functioning, role functioning, and perceived health in older age groups, particularly those groups aged 50 and older. Emotional functioning, however, tended to be better in older age groups. The association between physical and emotional functioning was strongest in older age groups. However, decrements in functional health status occurred selectively among older individuals with many of the elderly scoring as well as the average young adult on the measures of physical, role and emotional functioning.

Key words: functional status, functional health measures, variables, QOL, HRQL

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> "The functional declines that typically accompany advancing age are often dramatic and depressing" (*New York Times*, June 10, 1986).

As evidenced in the quotation above, conventional wisdom says that functional health--that is, physical, mental and role performance of daily activities--decreases as people get older. But professionals concerned with the study of aging are often struck not so much by the decline in functional health with age, but with the increased variation in function in those with advanced age. Some notable individuals and particular cultural groups seem to enjoy superior functioning at very old ages. This raises a series of questions. What is the actual relationship between functioning and age? How many people of advanced age actually function as well or better than young adults? Why do some people continue to function well despite the ravages of disease and the onslaught of age? Is there a mind-body connection at work so that those with better emotional function have better physical function and vice versa?

Literature Review

When one turns to the literature to explore what is known about the relationship between functioning and age, many studies exist that focus on the relationship between functioning and disease (e.g., Meltzner,

Carman & House, 1983; Rice & Cugliani, 1980) or functional limitations in the elderly (e.g., Branch & Jette, 1981; Jette & Branch, 1981; Katz, Branch, Branson, Papsidero, Beck, & Greer, 1983). The former studies tend to suggest, not surprisingly, that functioning and disease are related whereas the latter show that functional problems are common in older age groups. However, the literature is very sparse with respect to a basic question: What is the relationship between functioning and age across a wide range of ages? Only a few studies, all restricted to patient populations, have addressed this issue (e.g., Nelson et al., 1983; Parkerson, Gehlbach, Wagner, James, & Clapp, 1981). In this section, we briefly review the literature on the age-health relationship.

Functioning has been defined in diverse ways. Some investigators have used a global measure of disability whereas others have used more specific clinical and physiological measures of the functioning of organ systems. Few studies used comprehensive measures of functioning which include physical, role and emotional functioning. We found only two studies which employed assorted functioning measures across the age spectrum, and their generalizability is limited because they were conducted in selected patient populations (Nelson et al., 1983; Parkerson et al., 1981).

Measures of functioning differ from clinical measures of health status such as morbidity because they reflect the impact of disease on day-to-day life. Functional status of the elderly has been especially well-studied with many investigations including persons aged 60 and older (Branch & Jette, 1981; Fillenbaum, 1985; Jette & Branch, 1981;

Katz et al., 1983). Rarely has research examined functional status across a wide range of ages. The studies conducted to date suggest that physical functioning declines with age (Cape & Henschke, 1980; Chirikos & Nestel, 1985; Fillenbaum, 1985; Jette & Branch, 1981; Katz et al., 1983), and social disability, defined as unmet need for social services, increases with age (Branch & Jette, 1981). Parkerson et al. (1981) assessed the impact of age on functional status using the Duke-UNC Health Profile on a sample of 395 patients 18 and older in a family medicine clinic. Negative relationships between age and physical and social functioning were found. A significant positive relationship between age and symptoms was noted as well. Nelson et al. (1983) reported a negative correlation between physical functioning and age. Similarly, Feller (1983) found an increase in the proportion of persons requiring help with daily living activities as a function of age. None of these studies examined the interaction between different aspects of functioning.

The relationship between emotional functioning and age has been explored in several studies. A nonlinear relationship between emotional functioning and age has been suggested, but its exact form is unknown (Feinson, 1985). Parkerson et al. (1981) reported a negative association between age and emotional functioning. However, in a study of 758 outpatients aged 18-99, Cassileth et al. (1984) found that emotional functioning increased with age. Feinson (1985) reviewed the literature on the relationship between age and emotional functioning and noted that of the 31 studies reviewed, ten provided no evidence of decreased emotional function with age, eight indicated better emotional

function with increased age, and three concluded that emotional function decreases with age. Koenig (1986, p.384) concluded that there is "greater support for a decrease in frequency of mental disorders among older persons and an increased ability to cope with major life changes when compared with younger age groups."

Studies using global, subjective measures of perceived health reveal a tendency for health perceptions to be inversely related to age, with some exceptions. Consistent with conventional wisdom, Halpert and Zimmerman (1986) found in their study of 148 rural elderly that persons aged 60 to 74 were more likely to evaluate their health as excellent or good than were persons 75 and older. Similarly, the U.S. Bureau of the Census Survey, "Americans Assess Their Health 1978" (U.S. Department of Health and Human Services, 1983), showed increasing proportions of persons who assessed their health as fair or poor as age increased, up until age 80. After age 80, however, a decrease in the proportion of persons rating their health as fair or poor was observed. Some studies have found a larger proportion of persons 75 and older than those 65-74 rating their health as excellent or good (Ferraro, 1980). Interestingly, when 660 Illinois adults (18 and above) were asked to assess their health compared to others their age, only those 61 and older rated their health as better than their peers (Cockerham, Sharp, & Wilcox, 1983).

Measurement of Functioning Across a Wide Range of Ages

The measurement of health and functioning has improved dramatically in recent years. Applications of standard scaling techniques have generated highly refined multi-item scales for measuring physical,

emotional and role functioning, and current health perceptions. The advantages of multi-item health scales over single-item measures are well documented (Davies & Ware, 1981; Manning, Newhouse, & Ware, 1982). Single-item measures of health frequently are not precise enough to achieve satisfactory statistical power for hypothesis testing (Ware & Karmos, 1976; Manning et al., 1982). There is a number of standard multi-item health measures available (e.g., Bergner, Bobbitt, Carter, & Gilson, 1981; Ware, 1984), but these instruments tend to be too long for many applications. A short-form measure of health has recently been developed and evaluated. It was derived from self-report instruments that have been used extensively (c.f. Brook, Ware, Davies-Avery et al., 1979). This short-form instrument is comprehensive (assesses perceived health and physical, emotional and role functioning), reliable and valid, yet it consists of only 17 items (Stewart, Hays, & Ware, 1988). Short-form instruments, such as this one, provide comprehensive information on individual functioning in a cost-effective manner, without excessive respondent burden.

In general population studies only a small proportion of the respondents may have chronic disease or disability. Reliance on the measurement of only a narrow range of functioning, representing the most severe effects of disease, will provide little information for the majority of the sample. Comprehensive assessment of health status across a wide range of ages allows for the identification of multiple aspects of health which may show differential relationships with age and disease.

The purpose of this paper is to explore the following questions which prior research has left largely unanswered.

- How do physical, emotional and role functioning differ between age groups?
- How many older adults report functioning equal to or better than that of the average young adult?
- How do perceived health and energy level differ between age groups?
- What is the association between physical functioning and emotional functioning?

The strengths of this study include use of a short, standardized instrument in a general population with a wide range of ages, a comprehensive assessment of health status, and the ability to study age-health relations in a patient sample.

Method

Our analysis is based on information gathered in samples drawn from two different populations. These two cross-sectional, descriptive studies are described next.

Subjects

Samples were drawn from two populations: (1) a random sample of adults living in private households in the United States; and (2) a

consecutive series of patients visiting primary care practices in northern New England. Louis Harris and Associates (Harris & Associates, 1984) conducted the former study of 2008 adults in 1984 and the Dartmouth Primary Care Cooperative Information Project (Nelson et al., 1981; Nelson & Green, 1984) performed the latter research on 1227 ambulatory patients in 1981. The average age of the household sample was 36; the average age of the patient sample was 47. Fifty-six percent of the household sample and 67% of the patient sample were females. A total of 84% and 77% of the respondents reported that they were high school graduates in the household and patient samples, respectively.

Data Collection

The household sample consists of adults 18 years of age and older who were interviewed by telephone from August through October, 1984. Half of those sampled represent households enrolled in health maintenance organizations (HMOs) and half represent those in the fee-for-service (FFS) system. The FFS sample was identified using the random-digit-dialing method, based on an unclustered sampling frame, and stratified by region and by the Census Bureau's "size of place" designations. The same procedure was used for the HMO sample; households were first screened to identify those falling into known HMO areas, and sampling from 195 Standard Metropolitan Statistical Areas known to include HMOs yielded additional HMO enrollees. The methods used are documented in detail elsewhere (Montgomery & Paranjpe, 1985). The telephone interviews included measures of health status, source of

medical care, satisfaction with health care, and demographic variables. The patient sample was selected from a series of adults visiting 27 predominantly rural primary care medical practices. Patients completed self-administered questionnaires which assessed health status and demographic variables. The questionnaires were filled out while patients were waiting to see their physician and took approximately 10 minutes to complete. Approximately 90% of the patients who were asked to participate in the study did so.

Measures of Health

The health status measures that were used to assess physical, emotional and role functioning in the two samples were short-form adaptations of longer measures developed at the RAND Corporation for the Health Insurance Experiment and Medical Outcomes Study (Stewart & Ware, forthcoming; Stewart, Ware, & Brook, 1981; Veit & Ware, 1983; Ware, 1976, 1984). Items were selected for the short-form measures based on the criterion that the selected set best represents or captures the information contained in the constructs measured by the long-form scales. Table 1 presents details about the three functional health measures--physical, emotional and role functioning--which were used in both samples, a measure of perceived health used in the household sample, and a measure of energy level used in the patient sample.

In this study we examine data from both samples, although the data were not originally collected for this purpose. Because of the differences in the measures and the methods used to gather the data

Table 1

Description of Health Measures Used In Household And Patient Samples

Name of Scale	No. of Items	Reliability[a]	Description of Content
Physical Function			
Household	6	.88 (.55)	Vigorous activities;
Patient	7	.80 (.36)	Bending, lifting, stooping. Moderate activities; walk uphill, walk one block. Eating and dressing.
Emotional Function			
Household	5	.82 (.48)	Nervous person; Felt calm
Patient	8	.93 (.62)	and peaceful; felt downhearted; a happy person; down in the dumps.
Role Function			
Household	2	.76 (.61)	Unable to work at a job, around
Patient	3	.88 (.71)	the house, or go to school because of health; unable to do certain kinds of work, housework, or schoolwork because of health.

Table 1 continued

Name of Scale	No. of Items	Reliability[a]	Description of Content
Perceived Health			
Household	4	.83 (.55)	Somewhat ill; Healthy as anybody; Feeling bad; Health is excellent.
Energy Level			
Patient	4	.85 (.59)	How much energy; Felt tired; Feeling sluggish; waking up fresh

[a] Internal consistency reliability was estimated using Crombach's alpha coefficient. The estimated reliability for a single item is given in parentheses.

Note. Alpha reliability was also computed within five age groups: 18-24, 25-34, 35-49, 50-64, and 65 and over. Alpha ranged across age groups from .73 to .85 for physical function in the household sample and from .70 to .78 in the patient sample. Alpha ranged from .76 to .84 for emotional function in the household sample and .92 to .94 in the patient sample. Alpha ranged from .62 to .80 for role function in the patient

Table 1 continued

sample and from .85 to .92 in the patient sample. Alpha ranged from .75 to .84 for perceived health in the household sample. Alpha ranged from .82 to .89 for energy level in the patient sample.

(telephone versus self-administration), we do not compare the samples directly in this study.

Analysis Plan

Internal consistency reliabilities (Cronbach, 1951) of the health measures were computed within five different age groups (18-24, 25-34, 35-49, 50-64, 65+). In addition to this traditional test of item convergent validity, item discriminate validity across scales was evaluated. Discriminant validity is supported if an item correlates significantly higher with its hypothesized scale than it does with other scales. For example, items measuring physical functioning are expected to correlate higher with the physical functioning scale (corrected for the item being evaluated) than they correlate with scales measuring mental health or role functioning. After establishing that the items adequately represented the hypothesized scales, we summed appropriate items together to form derived health status scales. Scale scores were then transformed to a 0-100 scale for each measure, with higher scores representing better health.

The relations between age and different indicators of health status were assessed for males and females separately. Average scores on the health status variables for each of five age groups (18-24, 25-34, 35-49, 50-64, 65+) were compared using one-way ANOVAs (n's in different age groups were 243, 624, 592, 353, and 194 in the household sample, respectively, and 150, 303, 218, 241, and 311 in the patient sample, respectively). Thus, age group served as an independent variable in analyses of health status differences. We also calculated the

percentage of respondents in each age group that scored equal to or better than the average health score of the youngest age group (i.e., 18-24). Finally, the correlation between physical functioning and emotional functioning was evaluated by age group in both samples.

Results

Reliability and Validity of Health Status Measures

The internal consistency of the multi-item measures was excellent as evidenced by alpha reliability coefficients ranging from 0.76 to 0.93 for the overall samples (see Table 1). Reliability was also satisfactory in each of the different age groups; alpha internal consistency reliability was 0.62 or higher in all age groups. Thus, the multi-item scales exceeded the minimum standard for reliability of 0.50 needed for group comparisons (Helmstadter, 1964). In addition, item discriminant validity for these measures was strongly supported. In both samples, 80% or more of the item correlations with hypothesized scales were significantly higher than correlations with other scales. Thus, items tended to correlate higher with the scales they were designed to represent than they did with other scales.

Physical, Emotional and Role Functioning By Age Group

Table 2 and Table 3 provide descriptive statistics for measures of physical, emotional and role functioning by age group. Figures 1-6 display trends in measures of functional status by age and sex for the household and patient samples. Physical functioning was found to differ

Table 2

Distribution of Health Scores By Age Group in Household Sample

Scale	Age Group	Mean	Standard Deviation	Range
Physical Functioning				
	18-24	94.49	15.02	20-100
	25-34	95.77	12.42	0-100
	35-49	92.87	18.21	0-100
	50-64	83.23	26.62	0-100
	65+	76.91	29.55	0-100
Emotional Functioning				
	18-24	75.08	16.57	12-100
	25-34	77.03	16.41	0-100
	35-49	78.08	15.43	12-100
	50-64	79.42	16.36	4-100
	65+	81.70	16.36	0-100
Role Functioning				
	18-24	95.88	17.11	0-100
	25-34	96.39	15.99	0-100
	35-49	93.24	23.01	0-100
	50-64	84.14	33.97	0-100
	65+	74.74	39.83	0-100
Perceived Health				
	18-24	85.38	17.39	25-100
	25-34	87.14	17.68	6-100

Table 2 continued

Scale	Age Group	Mean	Standard Deviation	Range
	35-49	83.52	21.58	0-100
	50-64	72.56	28.99	0-100
	65+	71.99	27.40	0-100

Table 3

Distribution of Health Scores By Age Group in Patient Sample

Scale	Age Group	Mean	Standard Deviation	Range
Physical Functioning				
	18-24	96.80	9.49	43-100
	25-34	96.27	10.68	36-100
	35-49	91.12	16.52	14-100
	50-64	83.06	20.73	0-100
	65+	69.01	24.67	0-100
Emotional Functioning				
	18-24	68.33	20.78	10-100
	25-34	69.87	18.64	8-100
	35-49	64.58	22.12	2-100
	50-64	71.53	18.74	5-100
	65+	74.27	19.61	2-100
Role Functioning				
	18-24	93.78	21.98	0-100
	25-34	90.40	25.88	0-100
	35-49	81.10	34.31	0-100
	50-64	76.86	38.76	0-100
	65+	60.57	42.11	0-100
Energy Fatigue				
	18-24	62.56	19.95	10-100
	25-34	63.81	17.41	10-100

Table 3 continued

Scale	Age Group	Mean	Standard Deviation	Range
	35-49	56.35	22.06	5-100
	50-64	60.07	21.22	0-100
	65+	58.37	21.23	0-100

Figure 1: Physical Functioning by Age for Males

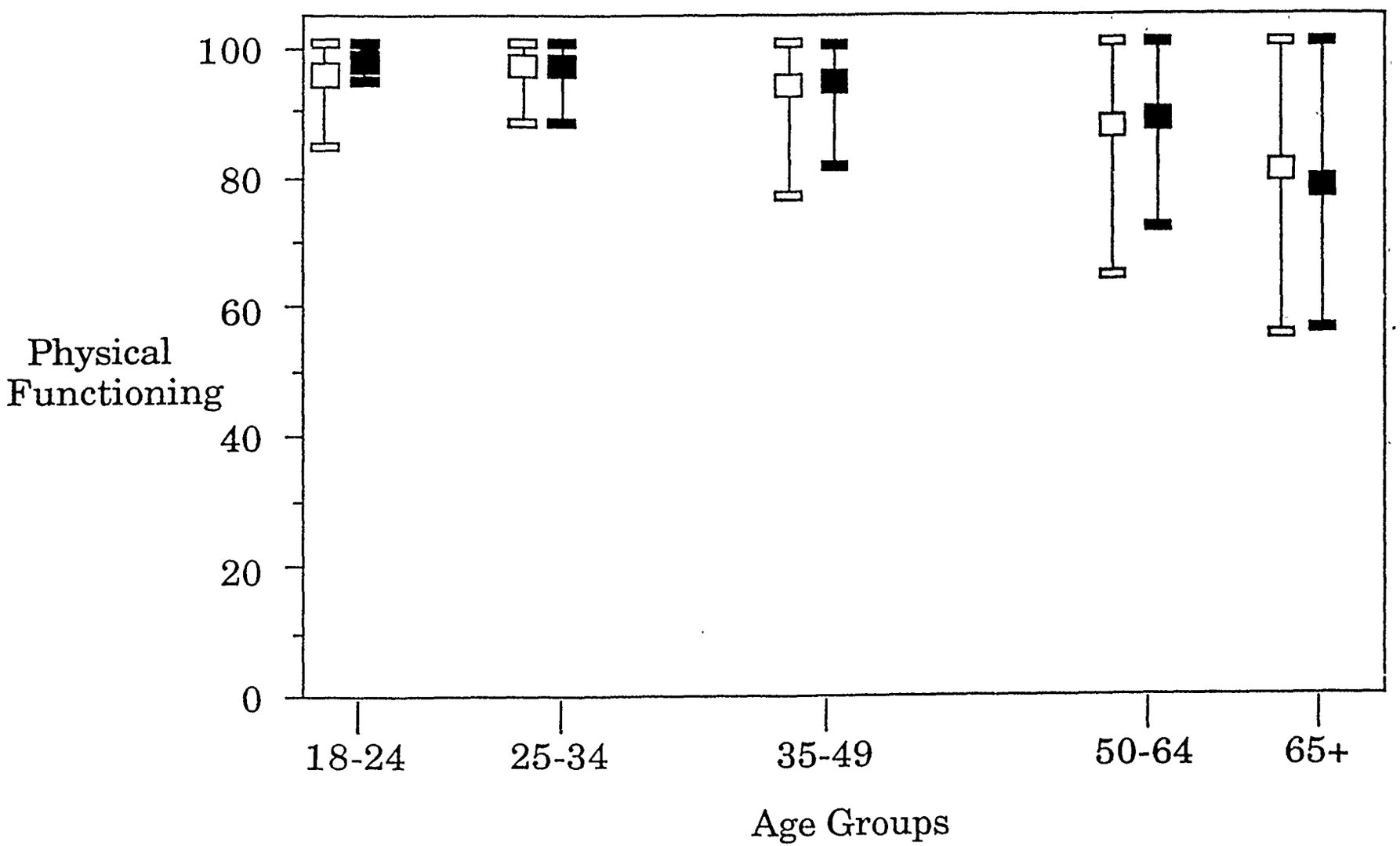
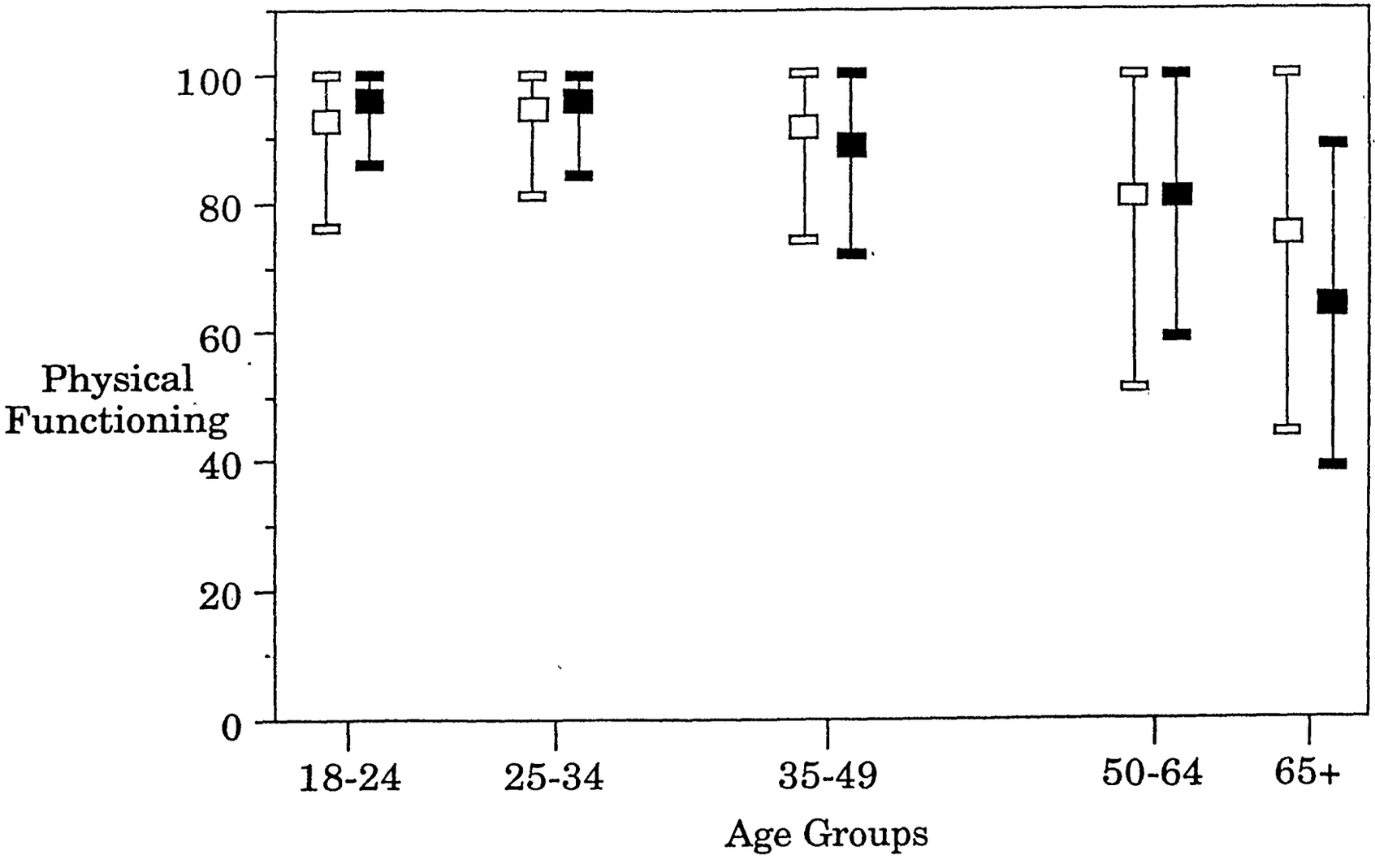


Figure 2: Physical Functioning by Age for Females



(□ = Household sample ; ■ = patient sample ; ⊟ , ⊤ = ±1 SD)

Figure 3: Emotional Functioning by Age for Males

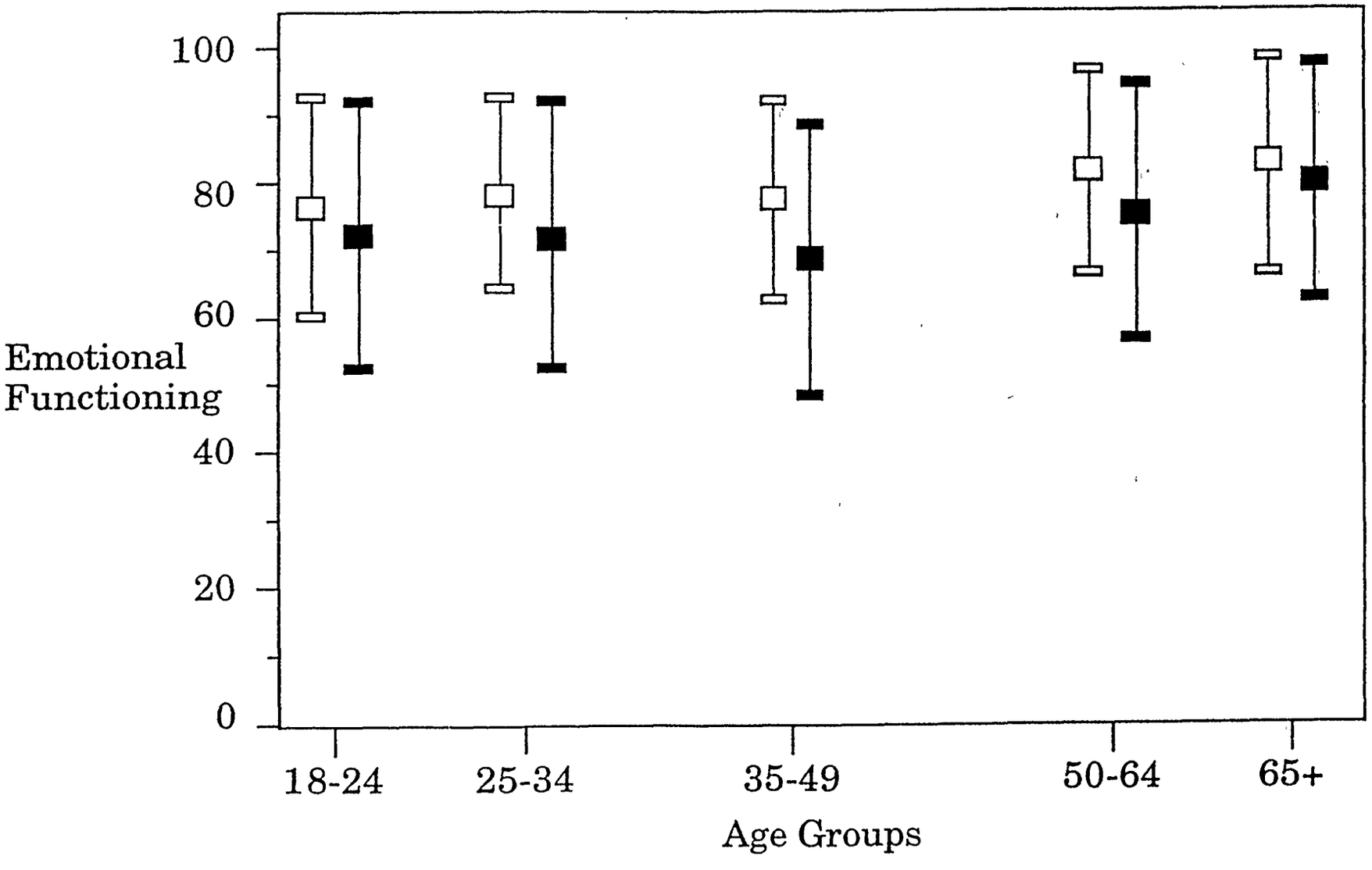
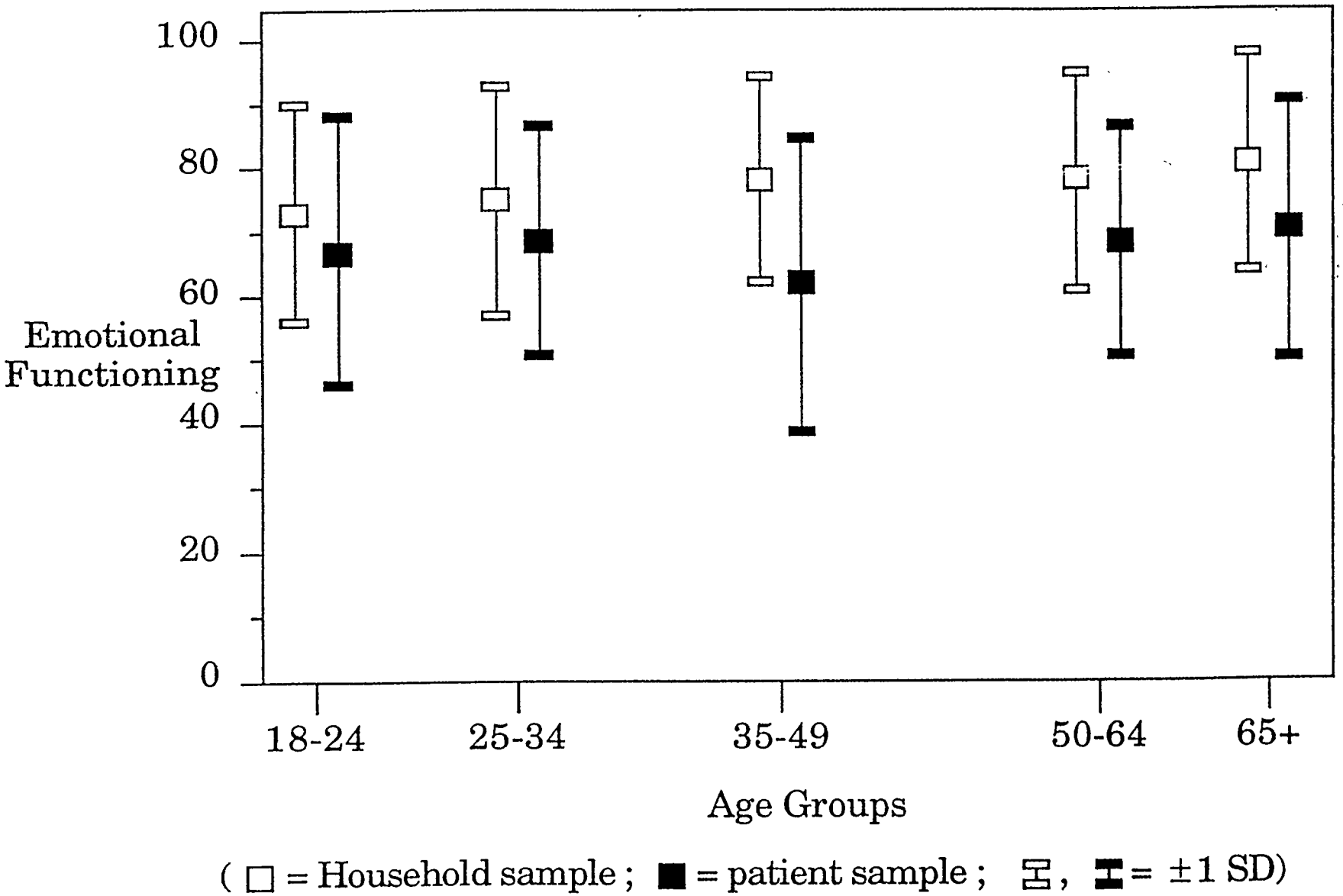


Figure 4: Emotional Functioning by Age for Females



(□ = Household sample ; ■ = patient sample ; 工, 工 = ±1 SD)

Figure 5: Role Functioning by Age for Males

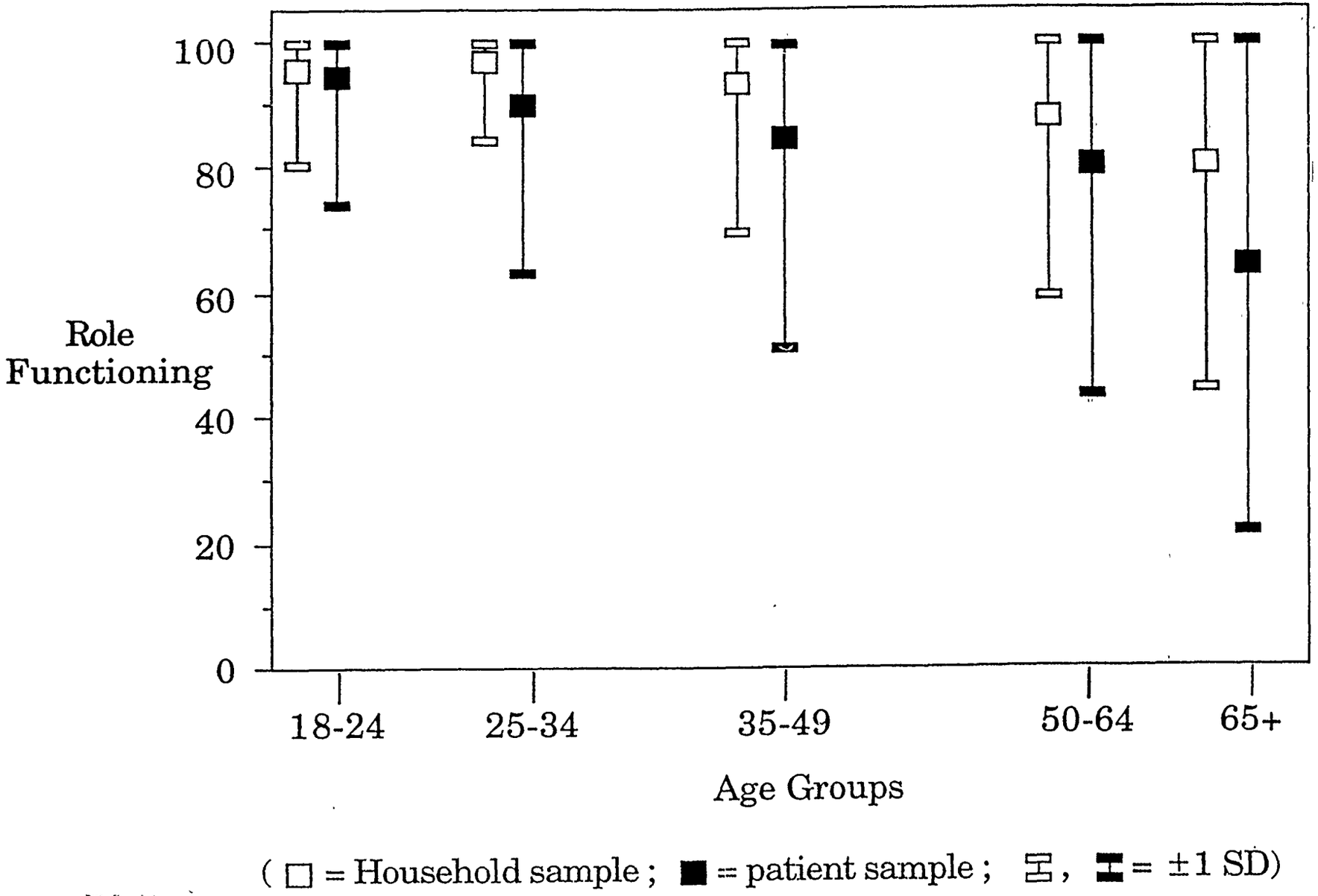
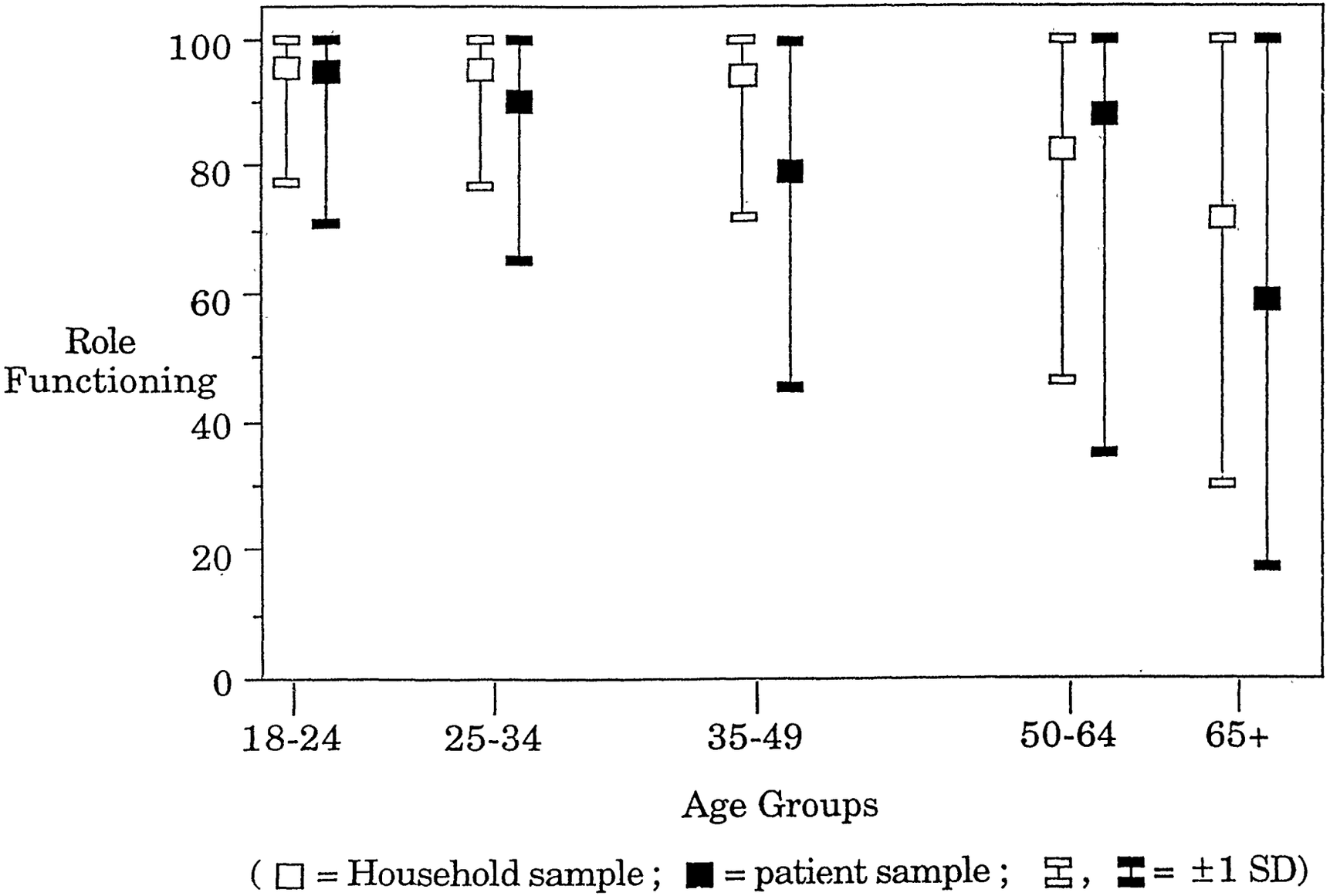


Figure 6: Role Functioning by Age for Females



significantly by age in both samples (household males: $F=18.67$, $p<.01$; household females: $F=30.35$, $p<.01$; patient males: $F=25.93$, $p<.01$; patient females: $F=95.18$, $p<.01$). However, the difference between groups was not significant (Duncan's multiple range test) in three of the four subsamples (i.e., household sample males and females; patient sample males) until after age 49. The lower level of physical performance with increasing age was more apparent in the patient sample than for the household sample. Males tended to score better on physical functioning than females for each age group but the difference between the sexes was smaller for the three younger age groups and larger for the two older groups. Males scored significantly higher than females in the patient sample for every group except the 25-34 age group.

Emotional functioning also differed significantly by age in both samples (household males: $F=2.73$, $p<.05$; household females: $F=4.74$, $p<.01$; patient males: $F=4.64$, $p<.01$; patient females: $F=4.73$, $p<.01$), but, unlike physical functioning, emotional functioning tended to be better in the older age groups. In three of the four subpopulations the oldest age group scored significantly better than the youngest age group (see Figures 3-4). The age group trends in emotional functioning varied by subsample. For example, the trend was curvilinear (linear, quadratic, cubic, and quartic trends were statistically significant) for females in the patient sample, with women in the middle age group scoring significantly worse than women in the younger and older age groups, whereas the trend for women in the household sample was monotonic with a gradual improvement in emotional functioning with older age. Males had significantly higher emotional functioning scores than

females for the 25-34 age group in the household sample and in the older age groups (35-49, 50-64, 65+) in the patient sample.

Significant differences in role functioning by age group were also observed (household males: $F=11.54$, $p<.01$; household females: $F=24.84$, $p<.01$; patient males: $F=10.11$, $p<.01$; patient females: $F=28.11$, $p<.01$). Role functioning age trends paralleled those observed for physical functioning, but with a more pronounced decrement observed for the older age groups, especially for the patient samples (see Figures 5-6). For example, the difference between role functioning scores for males in the youngest and oldest age groups was -16 for the household sample, but was -30 for the patient sample, with roughly half of the difference occurring between the 50-64 and 65+ age groups. Males scored significantly better on role functioning than females for the 25-34 and 50-64 age groups in the household sample.

Comparison of Older Adults With the Average Young Adult

Because levels of physical, emotional, and role functioning represent a continuum and absolute standards to define a "poor" level of functioning versus a "good" level of functioning are nonexistent, the clinical interpretation of differences in the levels of functioning may be difficult to make. One method to determine the clinical significance of a given level of functioning is to assume that the average young adult enjoys relatively "good" health and to compare the percentage of individuals in each age group who have equivalent or better levels of functioning.

The findings presented above showed that physical and role

functioning scores were lower for older persons, on average. However, Table 4 demonstrates that a majority of elderly in the community sample scored equal to or better than the mean score for people who were 40 years younger than them. Fifty-one percent (51%) of individuals aged 65+ had physical functioning scores equal to or better than the mean score of the 18-24 age group. Furthermore, 69% of the elderly had role functioning scores and 79% had emotional functioning scores that matched or exceeded the mean score of the youngest age group. Thus, only a subset of the aged displayed poorer functional status than younger respondents in the sample.

The patient population had smaller proportions of elderly scoring equal to or better than the mean score of the youngest age group than did the household sample (compare Table 4 with Table 5). This is particularly apparent in the area of physical functioning where only 17% of the age 65 and older group had scores that matched or exceeded the mean score for the youngest age group in the patient sample. Even in this sample, however, a substantial proportion of older people had emotional (70%) and role functioning (47%) scores equal to or better than the mean value registered in the 18-24 group.

Perceived Health and Energy Level

Perceived health for the household sample exhibited a "rectangular" trend with age (see Figure 7). The distribution of perceived health was relatively flat for the three younger age groups, then it dropped to a lower level and remained at this lower level. In contrast to the sex differential favoring males on physical and emotional functioning in

Table 4

Percentage of People in Older Age Groups Who Score Equal to or Better Than Mean of Youngest Age Group on Selected Measures of Health Status In Household Sample (N=2008)

Health Status Measure	Mean in 18-24 Age Group	Percent Scoring Equal To Or Better Than 18-24 Mean				
		18-24	25-34	35-49	50-64	65+
Physical Function	95	85%	86%	82%	61%	51%
Emotional Function	75	65%	69%	69%	74%	79%
Role Function	96	94%	95%	91%	80%	69%
Perceived Health	85	63%	68%	65%	48%	42%
(N)		(243)	(624)	(592)	(353)	(194)

Note: Scores were transformed to a 0 to 100 distribution and rounded to the nearest whole number. The large percentage of persons scoring above the mean is due to very skewed distributions, with the mode (i.e., most frequently occurring score) exceeding the mean.

Table 5

Percentage of People in Older Age Groups Who Score Equal to or Better Than Mean of Youngest Age Group on Selected Measures of Health Status in Patient Sample (N=1227)

Health Status Measure	Mean in 18-24 Age Group	Percent Scoring Equal To Or Better Than 18-24 Mean				
		18-24	25-34	35-49	50-64	65+
Physical Function	97	82%	81%	62%	37%	17%
Emotional Function	68	60%	61%	48%	61%	70%
Role Function	94	91%	86%	72%	71%	47%
Energy Level	63	57%	57%	43%	49%	49%
(N)		(150)	(303)	(218)	(241)	(311)

Note: Scores were transformed to a 0 to 100 distribution and rounded to the nearest whole number. The large percentage of persons scoring above the mean is due to very skewed distributions, with the mode (i.e., most frequently occurring score) exceeding the mean.

Figure 7: Perceived health status by age and sex for household sample

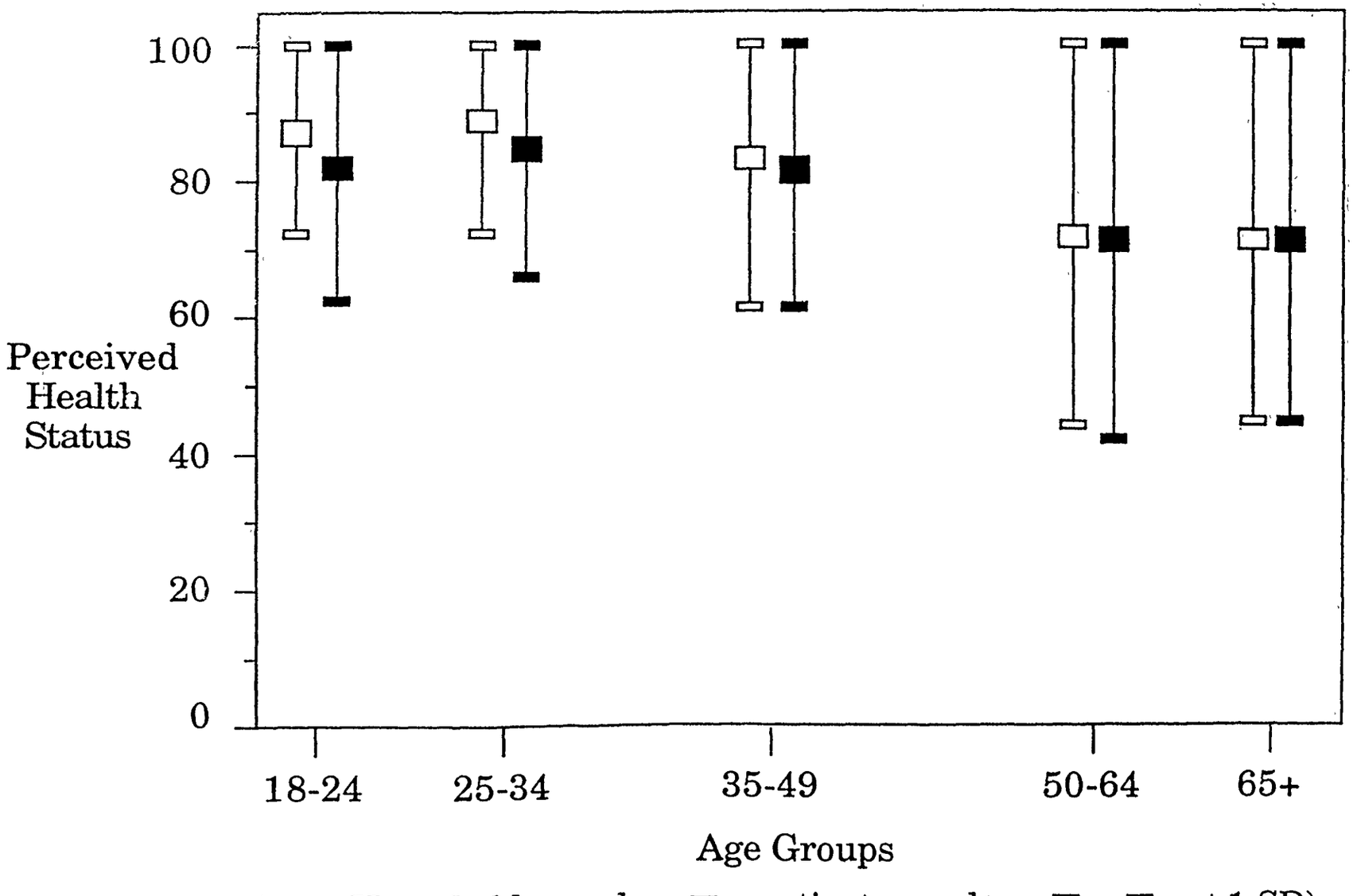


Figure 8: Energy level by age and sex for patient sample

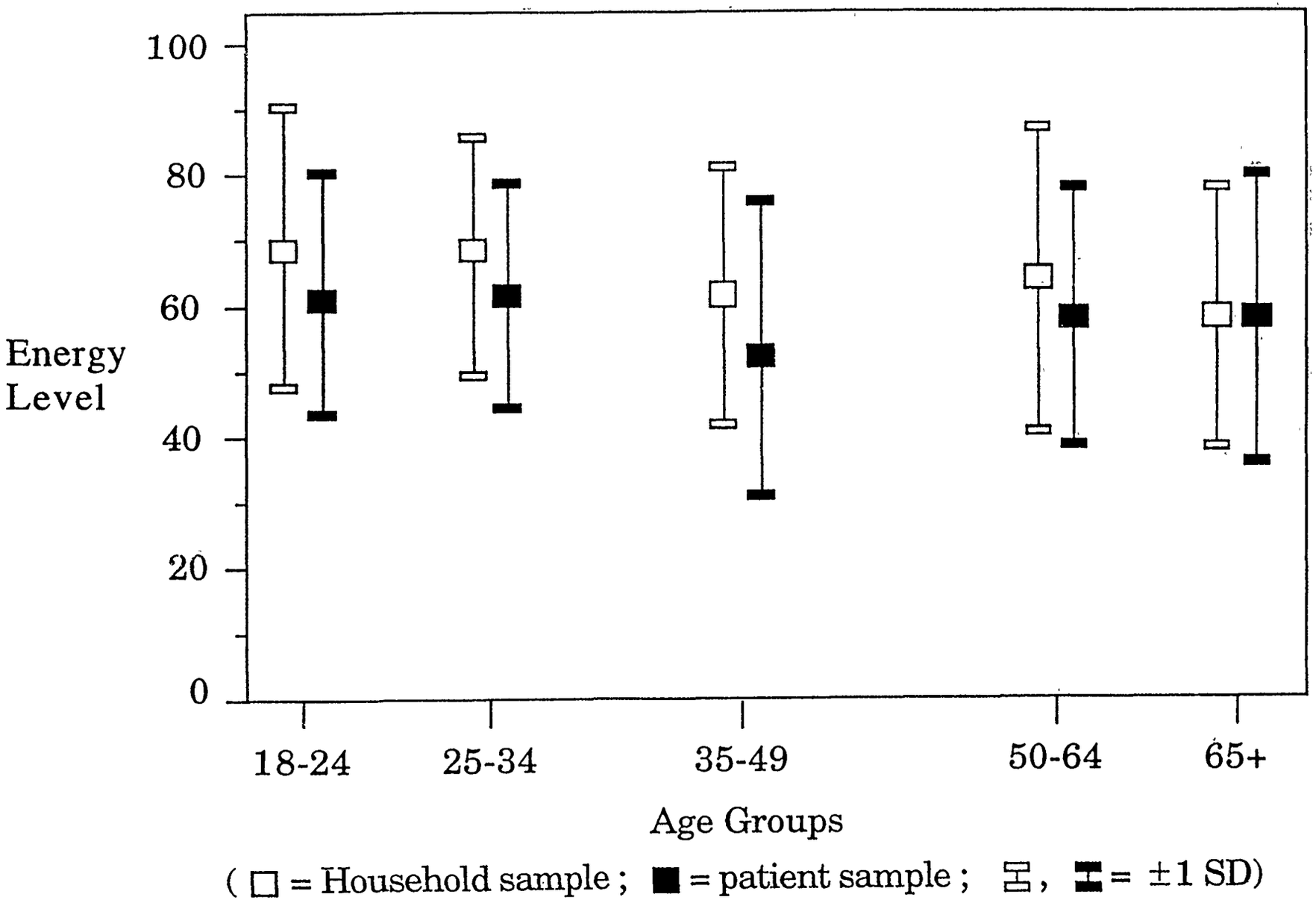


Table 6

Correlations Between Physical Functioning And Emotional Functioning

	Age Group				
	18-24	25-34	35-49	50-64	65+
Household Sample					
CORR	.18	.21	.31	.43	.35
SE	.06	.04	.04	.05	.07
(N)	(243)	(624)	(590)	(353)	(194)
Patient Sample					
CORR	.13	.16	.28	.30	.34
SE	.08	.06	.07	.07	.06
(N)	(150)	(302)	(215)	(239)	(309)

Note. CORR=Pearson's product-moment correlation; SE = Standard error of correlation, N=number of cases.

this sample, both sexes had similar scores on Perceived Health.

Energy level was lower for male patients as a function of age, with the largest difference being between the two younger age groups and the 35-49 age group (see Figure 8). For female patients, energy level was constant across age groups except for a sharp drop in the 35-49 age group. Male patients had significantly more energy than females in all age groups except for the oldest, where the scores of males and females were similar.

Relation Between Physical and Emotional Functioning

Finally, we were interested in looking at the association between physical and emotional functioning by age. Although previous research has shown moderate correlations between these two types of functional health, we were primarily interested in changes in the association as a function of age group. Results appear in Table 6. All correlations are statistically significant, ranging from 0.18 to 0.43 in the household sample and 0.13 to 0.34 in the patient sample. The correlations between physical and emotional functioning tended to increase with age. In the household sample, the correlation increased from 0.18 for the youngest age group to 0.43 for the 50-64 age group, and then dipped to 0.35 in the oldest age group. In the patient sample, the correlation increased throughout the age span, ranging from 0.13 to 0.34.

Discussion

Results show that perceived health, energy level, and physical, role and emotional functioning vary in different age groups. Perceived

health and physical and role functioning tended to be diminished in the older compared to the younger age groups. These decrements were particularly evident in the older age groups (i.e., 50-64 and 65+) and are consistent with conventional wisdom concerning physiologic changes in physical abilities with advancing age. Nevertheless, many older adults continue to enjoy levels of physical and role functioning equivalent to that of young adults. More than half of the older adults (i.e., age 50 and above) in the household sample had physical and role functioning scores that were equal to or better than the average scores for young adults (i.e., aged 18-24). In the patient sample, a notably smaller proportion of older adults had physical and role functioning scores that were equal to or better than the average for young adults.

In contrast to the findings for perceived health and physical and role functioning, emotional functioning, on average, tends to be better in the older than in the younger age groups. Almost 8 of 10 older adults in the household sample and 7 out of 10 older adults in the patient sample reported equal or better emotional health than the average young adult. Relatively good emotional functioning may be associated with greater life satisfaction among older adults, greater acceptance of their life situation, or the acquisition of skills over time that allow better adaptation to life (Koenig, 1986). The relationship between age and energy level interacted with gender such that energy level declined with older age for males, but energy level was lowest for females in the 35-49 age group.

The correlations between physical and emotional functioning for different age groups are intriguing. The magnitude of these

correlations for the two youngest age groups (18-24, 25-34) is similar to that reported for a sample of 1209 Health Insurance Experiment participants whose average age was 34.3 years (Ware, Davies-Avery, & Brook, 1980). The increasing strength of the relationship between physical and emotional functioning with age suggests that age-related decrements in physical functioning may have increasing effects on emotional well-being. In fact, larger associations between different areas of functioning with increasing age has been called the vulnerability hypothesis and confirmed in previous research (Fillenbaum, 1977-78; Youmans & Yarrow, 1971).

On the whole, the results reported here parallel those found by previous investigators. However, direct comparisons are not possible because the measures of health used in previous studies differ from those used here. Feller (1983) reported on data from a civilian noninstitutionalized population from the 1979 National Health Interview Survey. The results showed an association of poorer levels of health with increasing age, with women reporting poorer health than men at all ages. Similar results were reported by Branch and Jette (1981) in their research from the Framingham Disability Study. They reported significant age and sex differences, particularly in the performance of physical activities. Although the extent of disability in each age group varied, depending on the indicator of physical health, all three indicators showed decreased physical health with advancing age. Cassileth et al. (1984), in a study of outpatients in a university health clinic, showed that emotional health was better in older individuals. This trend was consistent among patients with six

different diagnoses (arthritis, depression, diabetes, cancer, renal disease, and dermatologic disorder).

The similarity of the results observed in the two different samples (a large representative sample of households and a large sample of primary care patients) increases our confidence in the findings of the present study. However, the limitations of the study should be noted. The cross-sectional design allows us to speculate about age group differences in functioning, but it does not permit us to detect longitudinal variations in functioning that may occur within the same individual. Ontogenetic changes are not separable from generational differences in this study (Schaie, 1981). A longitudinal study of a cohort of individuals would be necessary to illustrate the effects of aging on functioning free of generational effects.

Another limitation of this study is the lack of adjustment for differential mortality by age group. Results may therefore be biased due to the exclusion of patients from the older age groups, because individuals with poorer functioning may have greater risk of mortality than individuals with better functioning. If so, individuals with poor functioning would have been disproportionately excluded from the older age groups because of their higher mortality rates. The older age groups in this study may represent survivors who, not surprisingly, function better than non-survivors.

Examination of the association of age with clinical factors such as the presence of a chronic disease was not possible because data of this type was not collected. Finer gradations of age groupings may have been more informative, but that information was not available to us in

the household sample. These age groupings allow comparisons of functioning between younger, middle-aged, and older adults. Our data suggest that the rate of decline in physical functioning is worst among older adults. An important group to examine more closely in future studies is the older group, which should be divided into finer age divisions to explore more specific age-related relationships. Data from other studies (Feller, 1983; Jette & Branch, 1981; Katz, 1983) suggest that the incremental decline in function with age is greatest in those over 75. Analysis of associations of functioning with socioeconomic status may also have been enlightening, but this information was unavailable. Katz et al. (1983) found that active life expectancy was longer in the non-poor compared to the poor group. Future studies are needed to further examine the relation between socioeconomic status and functional health.

The picture of older adults which emerges from our results stands in sharp contrast to the sterotypes of the aged which characterize them as having "nonproductive, impaired, incapable, useless status with loss of virtually everything that contributes to personal capacity, performance, roles, and status of individuals in the world" (Eisdorfer, 1983, p. 198). Although stereotypes such as the above are clearly unsupported by data in this study, emphasis on this point is critical in light of the fact that public policy decisions concerning people of advanced age can be influenced by such inaccurate beliefs. A model of aging which encompasses a broad definition of health that includes not only the biologic dimension, but also the physical, emotional and social functioning dimensions may show that, although certain aspects of health

decline with age, others may actually improve. Such a multidimensional model of health allows for a more favorable view of the large proportion of the elderly who function well, and encourages the identification of subgroups of individuals at risk for declines in function. Strategies can then be developed to remedy or compensate for limitations which may occur in these select individuals.

The development and acceptance of a broad and functionally oriented model of aging requires that accurate data on physical, emotional and social functioning be collected longitudinally on people of various ages, taking into account important sociodemographic and clinical factors. This data can be used to construct the most accurate models of aging. Such models can be used to inform policymakers and to help forecast the future health of our aging population.

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