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How Do the Better Educated Do It? Socioeconomic Status and the Ability to Cope with Underlying Impairment

David M. Cutler, Mary Beth Landrum, and
Kate A. Stewart

The pronounced gradient in health among people in different socioeconomic groups is well known. People who are richer or better educated live longer and have a higher quality of life than people in lower socioeconomic status (SES) groups. The reason for this difference is not well understood, however. Health results from decisions made throughout the life course (McGinness and Foege 1993), perhaps even before birth (Barker 1994). To date, most attempts to explain the gradient have come up shorthanded (Adler et al. 1993), even those exploring health differences among youths (Case, Lubotsky, and Paxson 2002). In this chapter, we focus on one particular dimension of the socioeconomic gradient in health. We examine how elderly people in different socioeconomic groups cope with disability in performing basic personal care activities, including dressing, bathing, and getting around inside, and activities required to live independently, such as preparing meals, grocery shopping, and managing money.

Gradients in disability by socioeconomic status have been found in a large number of studies (see, for example, Fried and Guralnik 1997; Stuck et al. 1999; Guralnik, Fried, and Salive 1996, and the references therein) and recent studies have documented growing disparities in disability by socioeconomic status (Crimmins and Saito 2001; Schoeni et al. 2005). Two re-

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cent studies have attempted to understand the causal pathways between socioeconomic status and disability by examining transitions between health states, using longitudinal data. Zimmer and House (2003) decompose the association between education, income, and prevalent disability into two pieces: onset of new disability and progression among those disabled. They find that both income and education is associated with onset, but only income predicts subsequent progression, suggesting that income can serve both to prevent ill health and allow individuals to better manage illness. Similarly, Melzer et al. (2001) examined incidence, recovery, and mortality rates by educational attainment and found that education was strongly associated with incidence of disability but not related to recovery or risk of death among the disabled. In these studies, recovery or progression of disability could result from a number of factors, including better management of the diseases underlying the limitations and better ability to cope with limitations. In this chapter, we examine a single piece of this puzzle and consider whether differences in coping strategies allow the better off to resolve their disability more effectively than the less well off.

The motivation for our analysis is provided in figure 6.1. Panel A of the figure shows the age- and sex-adjusted income and education gradients in impairment in any of a number of measures of self-care tasks, such as bathing, dressing, and related activities (the data set and specific measures of disability are described later). We show impairment even accounting for the use of personal and technological aids. There is a very pronounced education relation in this measure of disability. Among those with less than any high school education, about 8 percent of the elderly are disabled. In the highest education group—those who are college grads—the rate is half as high. There is a moderate income gradient in disability as well, although the difference is primarily between the very poor—those earning below $10,000—and everyone else.

Panel B of this figure shows the income and education gradients in impairment in various measures of independent functioning, such as the ability to shop or do light housework. The story is very similar. Over 20 percent of the elderly with less than any high school are disabled, compared to below 15 percent among those with some college or more. There is also an income gradient in impairment along these dimensions. With one exception (people earning $40,000–$49,000 per year), disability declines monotonically with higher income.

Our analysis considers two primary issues. First, we ask how much of this gradient in health is a result of underlying differences in functioning versus the ability to cope with impairments. We show that while the bulk of the difference is a result of underlying functioning—the better off have much less difficulty with these measures even in the absence of help—coping is important as well. The better educated are less likely to have functional disabilities in the first place, and cope with them better when they occur.

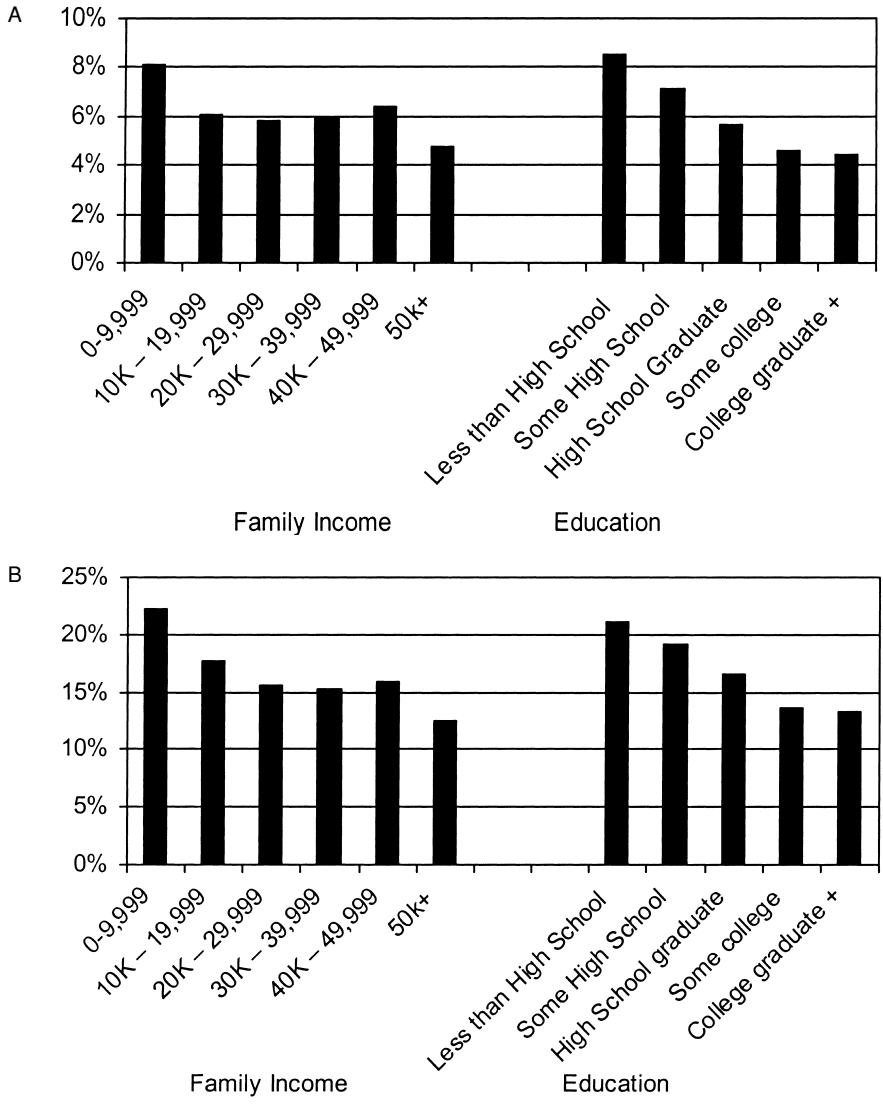

Fig. 6.1 Share of elderly reporting disability in ADLs or IADLS, even with use of help: *A*, Any ADLs; *B*, Any IADLs

Note: Estimates are adjusted for the age and sex mix of the population.

Second, we consider how the better educated elderly cope, and in particular whether the use of personal help and technological aids are important for successful coping. Better educated people use substantially more assistive technology than the less educated and are more likely to use paid help. Surprisingly, they are substantially less likely to use help from rela-

tives, so that overall use of personal care is actually lower among the better educated than among the less educated, even given their functional status.

Knowing about use of aids or paid help does not explain the education gradient in coping, however. Controlling for type of coping strategies does not affect in a material way the pronounced education gradient in coping with disability. We speculate that perhaps the intensity of use varies across education groups, that there is an interaction between the technology that is available and the environment in which the person lives, or that the more educated are more likely to cope through behavioral and/or environmental modifications (coping strategies not examined in this paper). Because our data go only so far, we leave open the analysis of these specific hypotheses.

Our chapter is structured as follows. The first section discusses the disability measures we considered and the data used. The second section presents analyses of the link between socioeconomic status and disability. The third section examines alternative explanations for the education gradient in coping, and the last section presents our conclusions.

6.1 Measures of Disability

Disability is a complex concept, related to a person's health, his or her environment, and his or her role expectations. As such, there is no perfect measure of disability. While most research in the nonelderly defines disability in terms of ability to work, we follow the lead of most researchers in measuring disability in the elderly as the presence of impairments in activities of daily living (ADLs), self-care tasks such as dressing and bathing, and instrumental activities of daily living (IADLs)—tasks required to live independently, such as preparing meals, doing housework, and managing money. Our data source, Phase 1 of the National Health Interview Disability Supplement of 1994 and 1995 (NHIS-D)—includes information on six ADL measures: bathing, dressing, eating, transferring to and from bed, toileting, and getting around inside the home. Questions are also asked about six IADL measures: grocery shopping, managing money, preparing meals, heavy housework, light housework, and using the telephone.

For any particular measure of disability, there are three relevant concepts. The first is termed *intrinsic disability,* the share of people who report difficulty on an item in the absence of any help from other people or equipment. We measure intrinsic disability for ADL tasks using a set of three questions from the NHIS-D. First, respondents are asked about receiving help from another person[1] and about the use of special equipment to per-

1. Specific questions are: "Because of physical, mental, or emotional problems, do you get help from another person" and "Because of a physical, mental, or emotional problem do you need to be reminded to do or need to have someone close by to do them" for ADL tasks, and "Because of a physical, mental, or emotional problem do you get help or supervision from another person" for IADL tasks.

form the task. Respondents who do not report personal or equipment help to do the activity are asked if they have any difficulty performing the task. We consider respondents to have intrinsic ADL disability if they either receive help from another person, use equipment to perform a task, or deny either of these forms of help but report difficulty performing the task. The NHIS-D did not ask about the use of special equipment for IADL tasks. Thus we define respondents as having intrinsic IADL disability if they report receiving help with the task or report difficulty in the absence of help.

We define *residual disability* as the share of people who report difficulty on an item even with help from others or special equipment. In the NHIS-D, respondents who report using special equipment or receiving help to perform a task were also asked how much difficulty they have performing the task even with this help.[2] We consider a respondent to have residual disability if he or she reports at least some difficulty, even with the help or use of equipment, or if he or she reports that help or use equipment is not received, but he or she but does have difficulty with the task.

The difference between intrinsic and residual difficulty is termed *coping*. Specifically, we define coping as that share of the population with intrinsic disability who do not have residual disability (i.e., the fraction of people for whom disability is completely resolved through the use of special equipment or help from another person).

There are many data sets that ask about either intrinsic disability (for example, the National Long Term Care Survey [NLTCS], the Medicare Current Beneficiary Survey [MCBS], and all years of the National Health Interview Survey [NHIS]). However, there are only a few data sets that ask about residual disability,[3] and to our knowledge only three data sets that asks about both intrinsic and residual disability—the NHIS-D, the 1993 AHEAD, and the First National Health and Nutrition Examination Survey (NHANES I) Epidemiologic Followup Study (NHEFS).[4] We chose

2. The response options for this question are no difficulty, some difficulty, a lot of difficulty, or completely unable.

3. For example, Verbrugge and Sevak (2002) also used residual disability measures in the NHIS-D to study the efficacy of various types of assistance; Verbrugge, Rennert, and Madans (1997) used measures of residual disability in the NHANES I, and Taylor and Hoenig (2004) and Agree (1999) studied residual disability using the Asset and Health Dynamics Among the Oldest Old (AHEAD). Several investigators have also examined coping with disability using other outcomes. For example, Agree and Freedman (2003) examined pain, fatigue, and time intensity associated with tasks, even when using help using the NHIS-D Phase 2 surveys, and Penning and Strain (1994) examined subjective feelings of well-being among those using assistance with daily tasks.

4. The 1993 AHEAD asks a similar set of questions about intrinsic and residual disability in ADLs as the NHIS-D. Specifically, respondents were first asked, "Does anyone ever help you . . . ," then for two of the ADLs (getting around inside and getting in and out of bed), respondents were asked, "Do you ever use equipment or devices when . . ." Respondents who report the use of either personal assistance or special equipment were then asked, "Even when someone helps you/using the equipment, do you have any difficulty . . ." Finally, respondents who deny personal or equipment help were asked, "Without any help or special equipment,

not to use the NHEFS because the data were collected in the 1980s and included only approximately 10,000 individuals. While the HRS/AHEAD data contains more detailed information on socioeconomic measures than the NHIS, we chose to use the NHIS-D in our analysis, for several reasons. First, the sample size is substantially larger for the 1994 to 1995 NHIS-D (almost 25,000 respondents age sixty-five and older, compared to approximately 8,000 respondents to the 1993 AHEAD). Second, the AHEAD data only contains information on residual disability in ADL measures, while the NHIS-D asked respondents about difficulty with help for ADL and IADL tasks. Finally, the AHEAD only asked respondents about the use of special equipment to aid in the performance of two of the ADL tasks.

The NHIS-D was conducted in 1994 and 1995 as a supplement to the regular National Health Interview Survey. The survey was administered in person at the same time as the NHIS Core and collected information on all members of the household age five and over. Several limitations of the NHIS-D should be noted. First, the NHIS is restricted to people living in the community. Disability rates are thus lower than those found in surveys that include institutionalized individuals (such as the NLTCS or the MCBS). Our analysis will not take into account SES differences in the likelihood of nursing home use. As residence in a nursing home suggests inability to cope with declining health and disability, our analysis may underestimate SES differentials in the ability to cope with disability.

Second, the NHIS-D contains imperfect measures of household income. Household income was measured in the 1994 and 1995 NHIS through two survey questions. First, respondents were asked if their family income was lower or higher than $20,000. Then respondents were asked to categorize their income into twenty-seven income groups. The detailed categories were not reported by approximately 20 percent of respondents in our sample.[5] For these respondents, the NCHS imputed family income using sequential hot-deck imputation within matrix cells.[6] Because of these mea-

do you have any difficulty . . .” In contrast, the NHEFS first asked about difficulty with twelve everyday tasks without assistance; “Please tell me if you have no difficulty, some difficulty, much difficulty, or are unable to do . . . at all when you are by yourself and without the use of aids.” Those reporting much difficulty or being unable to do the task were then asked about assistance from another person or help from special equipment, and those using assistance were asked about the degree of difficulty when they used the assistance.

5. The weaknesses in this approach to assessing household income become apparent by contrasting it to the approach taken in the HRS. For example, while 45 percent of responding households to the 1993 AHEAD refused to report their exact household income, 75 percent of these respondents completed an unfolding cascade while an additional 11 percent completed some of the unfolding cascade, so that household income was completely missing for only 6 percent of the households.

6. The imputation was aided by detailed income and wealth data collected in the Family Resource Supplement. Specifically, respondents age sixty-five and over were cross-classified according to total monthly family income reported in the Family Resources Supplement and median household income in their sampling segment. Within these cells, respondents were then sorted according to marital status, educational attainment, gender, and race-ethnicity

surement issues, and because household income may not adequately reflect resources and assets in an elderly retired sample, we focus our primary attention on the relationship between coping and education, noting that our estimates of the relationship between household income, disability, and coping are inherently limited by the available data.

The NHIS-D also collects data on difficulty with several measures of physical functioning: lifting something as heavy as ten pounds, walking up ten steps without resting, walking a quarter of a mile, standing for about twenty minutes, bending down from a standing position to pick up an object from the floor, reaching up overhead or reaching out as if to shake someone's hand, using fingers to grasp or handle something, and holding a pen or pencil, and the use of specific assistive technologies (not in conjunction with ADL or IADL tasks) including canes, crutches, walkers, orthopedic shoes, manual and electric wheelchairs, scooters, and braces. Sociodemographic variables include information on respondents' age, race, gender, marital status, educational attainment, and household income, taken from the core survey. All analyses accounted for the complex survey design and for pooling data from both survey years using approximations based on Taylor-series linearizations.[7]

6.2 Descriptive Statistics

We start our empirical analysis with basic data on disability. Although the NHIS-D is administered to people of nearly all ages, we focus on the elderly population (ages sixty-five and older), since ADL and IADL disability rates are much higher in the elderly than in the nonelderly. This also allows us to compare our results with most of the existing literature, which has focused predominantly on the elderly population. In two years of administration, the NHIS-D collected data on 24,791 people age sixty-five and older.

Table 6.1 presents basic descriptive data on the population. Fifty-eight percent of the population is female and 89 percent is white. Fifty-seven percent of the population is married and a third is widowed. The education distribution is skewed toward less completed schooling. Twenty-two per-

for respondents who indicated their household income was less than $20,000, and according to educational attainment, hours worked per week, marital status, and number of adult workers in the family for those who reported their income to be over $20,000. Hot-deck imputation was then implemented within these sorted cells. For more details see "Methods used to impute annual family income in the National Health Interview Survey, 1990–1996" http://www.cdc.gov/nchs/products/elec_prods/subject/impute.htm. Last accessed December 22, 2005.

7. For details, see "Variance estimation for person data using Sudaan and the National Health Interview Survey (NHIS): Public use person data files, 1994–1995: Combining 1994 and 1995 data only" http://www.cdc.gov/nchs/data/nhis/94_95var.pdf. Last accessed December 22, 2005.

Table 6.1 **Demographic characteristics of 65 and over population from NHIS-D, 1994 and 1995**

	Percent of people (N = 24,791; weighted N = 31,245,306)
Male	41.7
Married	57.0
Div/sep	6.4
Widowed	32.5
Never married	4.0
Unknown marital status	0.1
Black/other	10.5
Age	
65–69	31.0
70–74	27.7
75–79	19.8
80–84	12.8
85 and over	8.6
Education	
Less than high school	21.8
Some high school	15.4
High school grad	34.7
Some college	13.7
College grad or higher	13.3
Unknown educational attainment	1.1
Annual Family Income	
0–9,999	18.3
10K–19,999	30.8
20K–29,999	21.3
30K–39,999	11.6
40K–49,999	6.5
50k+	11.5

cent of the sample did not start high school. Another fifteen percent started high school but did not finish. Modal income is between $10,000 and $20,000.

Table 6.2 shows data on disability and coping rates. Nearly 10 percent of the population reports some intrinsic ADL disability. This rate is comparable to other surveys that have asked about intrinsic disability among community dwelling elderly. For example, rates of ADL disability—defined as getting help or using special equipment with one or more ADL, among community-dwelling elderly age seventy were approximately 15 percent in the 1995 HRS and the 1994 NLTCS and slightly over 20 percent in the 1994 MCBS (Freedman et al. 2004). Over 6 percent of the respondents report residual disability (difficulty completing the task even with

Table 6.2 **Intrinsic and residual disability in the population and ability to cope among the intrinsically disabled, by type of ADL and IADL (N = 24,791)**

	Percentage reporting intrinsic disability	Percentage reporting residual disability	Percentage of respondents with intrinsic disability who cope effectively
Activities of daily living (any)	9.5	6.4	32.3
Bathing	7.7	4.7	39.1
Getting around inside	4.4	3.2	26.6
Dressing	4.4	2.9	33.5
Transferring	4.1	3.1	25.4
Toileting	3.7	2.3	36.9
Eating	1.4	0.9	37.8
Instrumental activities of daily living (any)	22.7	17.0	25.3
Heavy housework	21.6	15.7	27.0
Shopping	9.8	6.7	31.9
Light housework	7.3	5.4	26.1
Preparing meals	5.9	4.1	31.3
Managing money	4.8	3.0	36.9
Using the telephone	2.5	1.7	32.1

help or special equipment) on at least one ADL, meaning that approximately one-third of the elderly population effectively copes with an underlying health problem, so that all of their ADL limitations are resolved through the use of help or equipment.[8] Looking within categories, the most common ADL impairment is difficulty bathing (7.7 percent) and the least common is difficulty eating (1.4 percent). The other measures are relatively similar, at about 4 percent each. Coping rates vary less across the tasks, ranging from 25 percent for transferring to 39 percent for bathing.

A much larger share of the population—nearly one quarter—reports an intrinsic IADL disability. The ability to cope with IADL disability is smaller; only one-quarter of people report that help completely alleviates their difficulty in performing important tasks required for independent living. By a wide margin, the most common IADL disability is doing heavy housework (22 percent). Activities associated with lighter housework or

8. Verbrugge and Sevak (2002) found similar levels of coping across ADL and IADL tasks among NHIS-D respondents age fifty-five and older. These rates can also be compared to those reported by Agree (1999) in an analysis of the 1993 AHEAD. She found that 68 percent of respondents with ADL disability reported residual difficulty performing tasks. Verbrugge, Rennert, and Madans (1997), analyzing data from the NHANES I Epidemiologic Followup Study, found that assistance (either personal or equipment) resolved difficulty in about 25 percent of those with functional limitations and/or disability.

shopping are second in importance (7 to 10 percent). Coping rates are again not particularly different across the various categories, ranging from 26 percent for light housework to 37 percent for managing money.

Figure 6.1 presented the relation between socioeconomic status and residual disability. Figure 6.2 presents the complementary figure for intrinsic disability. As with residual disability, intrinsic disability is substantially different by income and education. The highest education group has

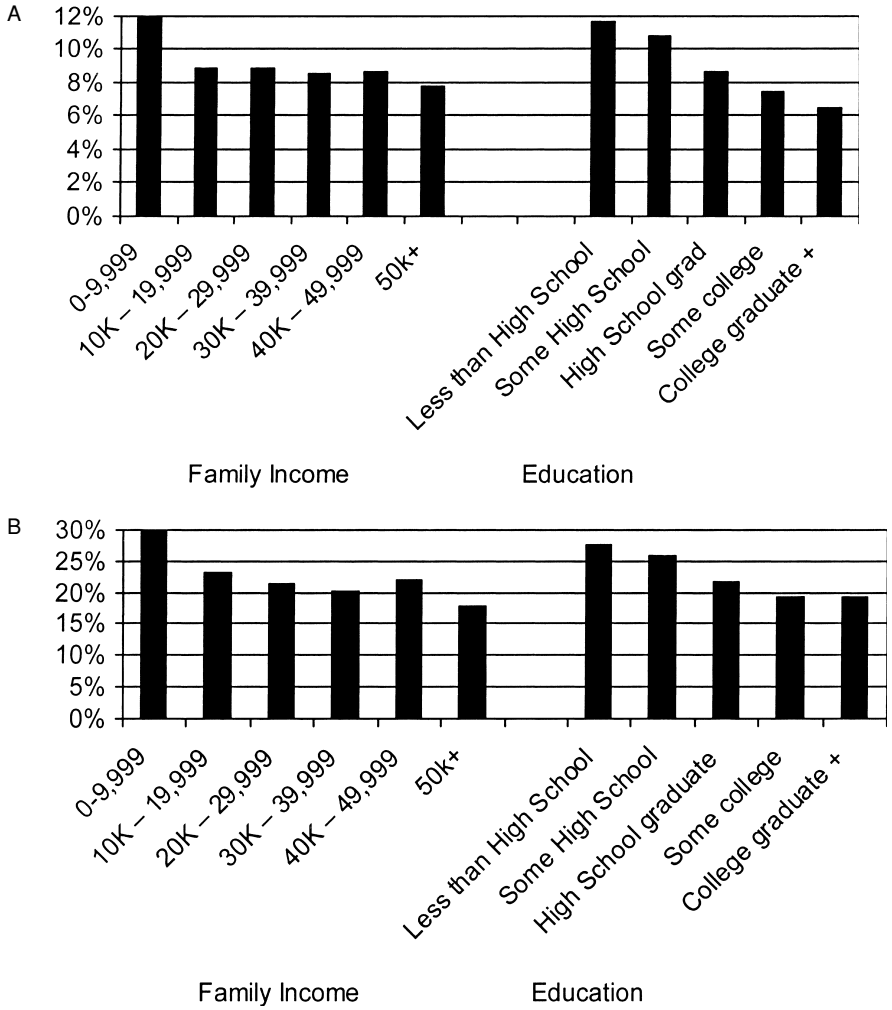

Fig. 6.2 Share of elderly reporting disability in ADLs or IADLS in the absence of receiving help: *A*, Any ADLs; *B*, Any IADLs

Note: Estimates are adjusted for the age and sex mix of the population.

an intrinsic disability rate for ADLs that is approximately half as large as the lowest education group. The variation across income groups is slightly smaller, but still large. There is large variation in IADL disability both by income and education.

The key issue for coping is the difference between intrinsic and residual disability. Figure 6.3 shows how coping varies by income and education. There is little variation in ability to cope with ADL impairments by income (fig. 6.3a). Only the highest income group has higher rates of coping than

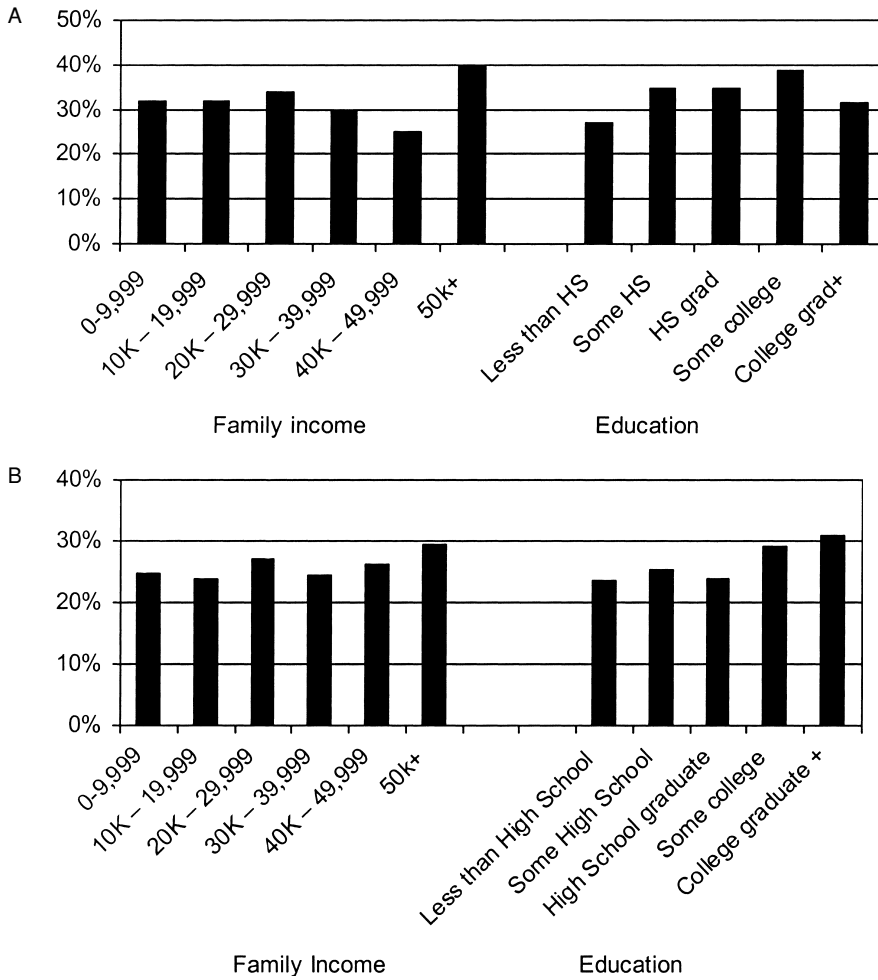

Fig. 6.3 Ability to cope for "any ADLs" and "any IADLs" by family income and education, adjusted for age and sex: *A*, Any ADLs; *B*, Any IADLs

Note: Estimates are adjusted for the age and sex mix of the population.

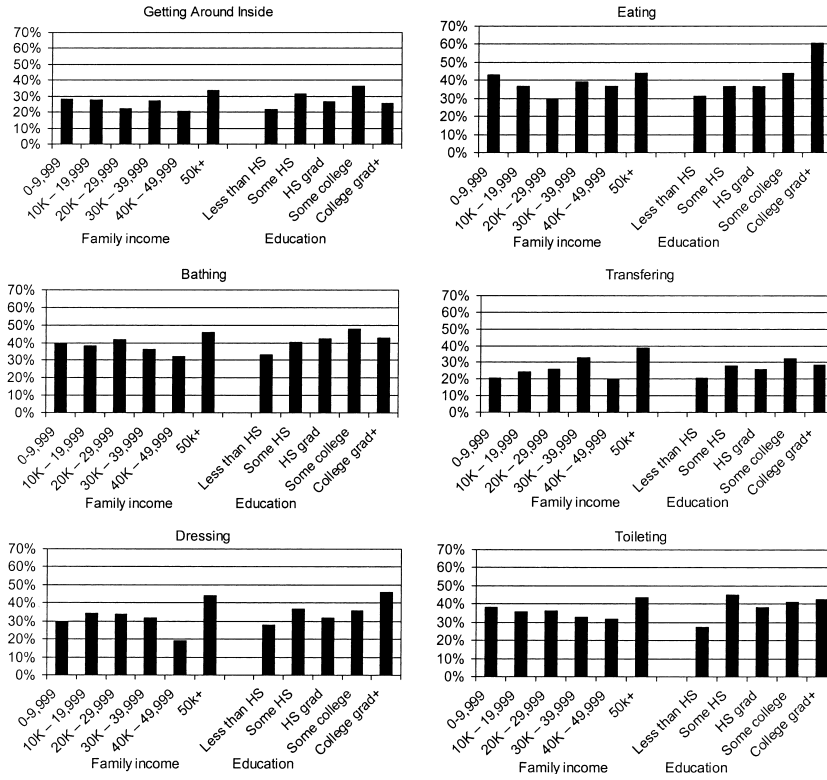

Fig. 6.4 Coping ability by specific ADLs

Note: Estimates are adjusted for the age and sex mix of the population.

the average, and the second-highest group has the lowest rates of coping. Coping ability generally increases with education, with the exception of the best educated group. Thirty-nine percent of those with some college cope with intrinsic ADL disability, compared to only 27 percent of the less well educated. The story is similar for coping with IADL impairments (fig. 6.3b). There is little variation in coping with IADL impairments across income groups, and a pronounced education gradient in coping.

Figures 6.4 and 6.5 show income and education gradients in coping, according to task. Education gradients in ADL coping are most pronounced for coping with difficulties in eating and dressing. This is interesting, given that these are areas where use of equipment is very minor, but use of personal help is much greater (shown in table 6.7). Education gradients in coping with IADL disabilities are largest for light and heavy housework—again, areas where personal help, especially paid help, can be very important. In contrast, there are few differences across income and educa-

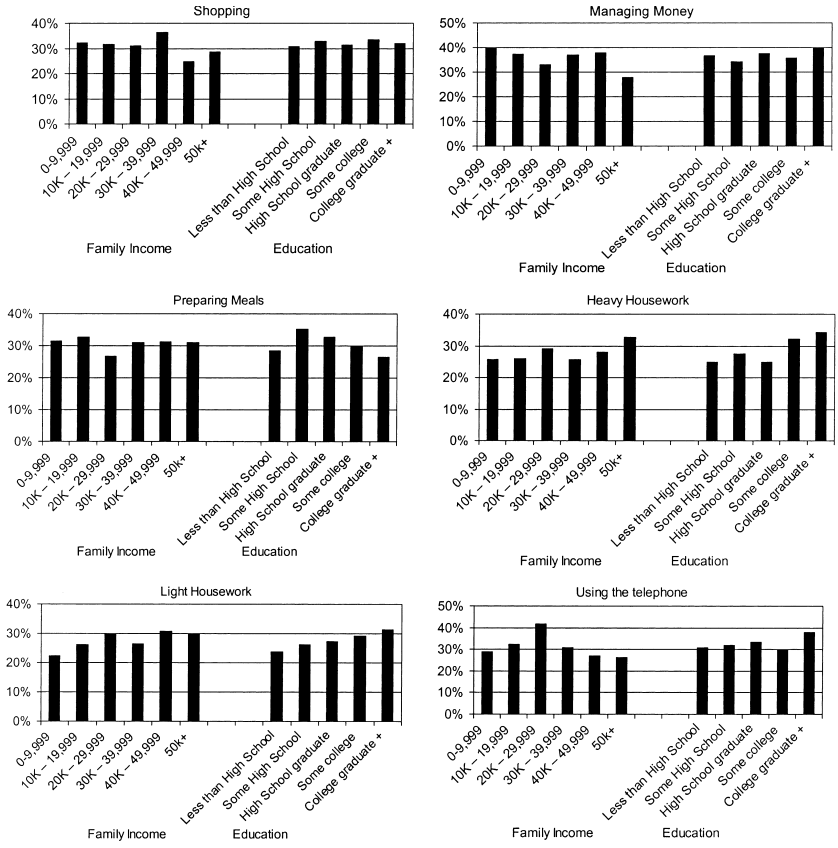

Fig. 6.5 Coping ability by specific IADLs

Note: Estimates are adjusted for the age and sex mix of the population.

tion groups in coping with difficulties managing money, grocery shopping, and using the telephone.

While figures 6.1 through 6.3 are age and sex adjusted, we also want to control for other demographic differences across groups. Table 6.3 reports basic regression results for intrinsic disability and table 6.4 shows results for residual disability. The first regression in each table is for any disability—either ADL or IADL impairment; the second and third regressions are for any ADL and IADL disability separately. In addition to five-year age and sex groups and their interaction and the income and education dummy variables, we include controls for marital status (married, widowed, or separated/divorced/single) interacted with gender and race (white or nonwhite).

Older and nonwhite respondents are more likely to report disability and

Table 6.3 **Logistic regression models for intrinsic disability**

	Any disability		Any ADL disability		Any IADL disability	
Independent variable	Coefficient (SE)	Adjusted percent	Coefficient (SE)	Adjusted percent	Coefficient (SE)	Adjusted percent
Income						
$0–$9,999		28.4		10.3		26.6
$10K–$19,000	–0.24 (0.05)*	24.2	–0.20 (0.06)*	8.7	–0.21 (0.05)*	22.9
$20K–$29,999	–0.29 (0.06)*	23.4	–0.11 (0.08)	9.4	–0.25 (0.06)*	22.3
$30K–$39,999	–0.32 (0.07)*	22.9	–0.10 (0.10)	9.4	–0.29 (0.08)*	21.7
$40K–$49,999	–0.18 (0.09)*	25.2	–0.05 (0.11)	9.9	–0.16 (0.09)	23.8
$50K +	–0.43 (0.08)*	21.1	–0.14 (0.11)	9.1	–0.41 (0.08)*	19.8
Education						
Less than high school		27.9		11.3		26.3
Some high school	–0.08 (0.05)	26.5	–0.07 (0.07)	10.7	–0.07 (0.05)	25.1
High school graduate	–0.24 (0.05)*	23.7	–0.30 (0.06)*	8.8	–0.24 (0.05)*	22.2
Some college	–0.40 (0.06)*	21.1	–0.45 (0.09)*	7.7	–0.39 (0.06)*	20.0
College grad or higher	–0.38 (0.07)*	21.4	–0.62 (0.09)*	6.6	–0.34 (0.07)*	20.7
Male	–0.33 (0.07)*		0.01 (0.12)		–0.38 (0.07)*	
Age 70–74	0.18 (0.06)*		0.43 (0.10)*		0.15 (0.06)*	
Age 75–79	0.55 (0.07)*		0.73 (0.10)*		0.51 (0.07)*	
Age 80–84	0.98 (0.07)*		1.42 (0.11)*		0.93 (0.07)*	
Age 85+	1.57 (0.08)*		1.94 (0.11)*		1.52 (0.08)*	

Age*sex			
70–74*male	0.05 (0.10)	0.28 (0.17)	0.06 (0.10)
75–79*male	–0.02 (0.11)	–0.14 (0.17)	–0.06 (0.11)
80–84*male	0.11 (0.10)	0.24 (0.17)	0.09 (0.10)
85plus*male	0.01 (0.12)	0.23 (0.17)	0.02 (0.12)
Widowed	0.32 (0.05)*	0.29 (0.07)*	0.33 (0.05)*
Divorced/separated/single	0.26 (0.18)*	0.34 (0.10)*	0.24 (0.08)*
Marital status*sex			
Widowed*male	0.02 (0.09)	–0.07 (0.13)	0.05 (0.09)
Divorced/separated/Single*male	0.02 (0.11)	–0.11 (0.16)	0.13 (0.11)
Black/other race	0.11 (0.06)	0.18 (0.08)*	0.12 (0.06)*
N	24,476	24,476	24,476

Notes: The definition of intrinsic ADL disability includes difficulty alone or without help or equipment; the definition for intrinsic IADL disability includes only difficulty alone or without help. Individuals missing values for educational attainment ($n = 295$) and/or marital status ($n = 25$) were dropped from regression analyses.

*$p < 0.05$.

Table 6.4 **Logistic regression models for residual disability**

	Any disability		Any ADL disability		Any IADL disability	
	Coefficient (SE)	Adjusted percent	Coefficient (SE)	Adjusted percent	Coefficient (SE)	Adjusted percent
Income						
$0–$9,999		21.5		7.1		19.8
$10K–$19,000	–0.19 (0.05)*	18.7	–0.20 (0.07)*	5.9	–0.17 (0.06)*	17.4
$20K–$29,999	–0.26 (0.06)*	17.8	–0.15 (0.09)	6.2	–0.25 (0.07)*	16.3
$30K–$39,999	–0.24 (0.08)*	18.0	–0.07 (0.12)	6.6	–0.23 (0.09)*	16.5
$40K–$49,999	–0.16 (0.09)	19.2	0.03 (0.13)	7.3	–0.15 (0.10)	17.6
$50K+	–0.42 (0.09)*	15.7	–0.27 (0.15)	5.5	–0.42 (0.09)*	14.2
Education						
Less than high school		22.1		8.3		20.0
Some high school	–0.11 (0.05)*	20.4	–0.18 (0.08)*	7.1	–0.09 (0.05)	18.7
High school graduate	–0.26 (0.05)*	18.2	–0.41 (0.07)*	5.8	–0.22 (0.05)*	16.9
Some college	–0.48 (0.06)*	15.4	–0.63 (0.11)*	4.7	–0.43 (0.06)*	14.3
College grad or higher	–0.49 (0.07)*	15.3	–0.67 (0.11)*	4.5	–0.42 (0.07)*	14.4
Male	–0.31 (0.08)*		0.04 (0.13)		–0.33 (0.05)*	
Age 70–74	0.12 (0.07)		0.45 (0.11)*		0.10 (0.07)	
Age 75–79	0.49 (0.07)*		0.72 (0.12)*		0.48 (0.07)*	
Age 80–84	0.89 (0.07)*		1.37 (0.12)*		0.83 (0.08)*	
Age 85+	1.40 (0.09)*		1.81 (0.13)*		1.33 (0.09)*	

Age*sex			
70–74*male	0.10 (0.11)	–0.42 (0.20)*	0.14 (0.11)
75–79*male	0.01 (0.11)	0.06 (0.19)	–0.06 (0.12)
80–84*male	0.11 (0.12)	–0.22 (0.18)	0.11 (0.12)
85plus*male	0.16 (0.13)	–0.26 (0.20)	0.15 (0.13)
Widowed	0.27 (0.06)*	0.12 (0.09)	0.29 (0.06)*
Divorced/separated/single	0.32 (0.07)*	0.30 (0.11)*	0.31 (0.08)*
Marital status*sex			
Widowed*male	0.01 (0.10)	–0.04 (0.16)	0.01 (0.10)
Divorced/separate/single*male	–0.04 (0.12)	–0.20 (0.19)	0.03 (0.12)
Black/other race	0.10 (0.07)	0.16 (0.09)	0.12 (0.07)
N	24,476	24,476	24,476

Notes: The definition of intrinsic ADL disability includes difficulty alone or without help or equipment; the definition for intrinsic IADL disability includes only difficulty alone or without help. Individuals missing values for educational attainment ($n = 295$) and/or marital status ($n = 25$) were dropped from regression analyses.

*$p < 0.05$.

women are more likely to report IADL disability. There is little indication that age effects varied by gender of the respondents. Single people, whether widowed or divorced/separated/never married, have higher rates of disability than do married people. Surprisingly, this effect is similar for men and women. Including these demographic variables has little impact on the education and income results. For example, the difference in residual ADL disability between the best educated and the least educated in figure 6.1 is 4.1 percentage points; the difference in table 6.4 is 3.8 percentage points. In the case of residual IADL disability, the unadjusted difference is 7.7 percentage points, and the adjusted difference is 5.6 percentage points. Our findings are thus not an artifact of demographic differences in the various groups.

Table 6.5 shows how coping differs by income and education, controlling for demographic factors and the severity of the underlying disability as measured by the number of reported limitations. Ability to cope is strongly negatively related to the number of limitations. In contrast to intrinsic or residual disability, there are few differences across demographic groups in coping with disability.[9] Similar to the age- and sex-adjusted results presented in figure 6.3, we find differential effects in coping by education but not by income. Coping with ADL disability is four to ten percentage points higher among all respondents with at least some high school compared to those who never started high school, with the highest rates of coping (38 percent) among those with some college education. Coping with IADL disability is about five percentage points higher among college graduates compared to those with a high school degree or less.

Because there may be differences in the relationship between coping with disability and socioeconomic status according to gender, we examined differences in coping separately by women and men. Figure 6.6 displays differences in coping by education and income in men and women (full regression results reported in tables 6A.1 and 6A.2 in the Appendix). In contrast to combined results in men and women, there are income differentials in coping among men, particularly at the highest levels of income. Coping rates are eleven percentage points higher among men with family incomes $50,000 and over compared to those with incomes under $10,000. Differences in coping by level of education are only evident among women, although the small number of males in our sample limits our power to detect these associations. Coping rates are four to eight percentage points higher in women with at least a high school diploma compared to women with less than high school education.

9. This is similar to results presented in Verbrugge and Sevak (2002), who find that need characteristics, such as severity of disability and poor health status, explain as much as 30 percent of the variance in resolving difficulty with ADL and IADL tasks while predisposing and enabling characteristics, such as age, race, marital status, and socioeconomic status, are much smaller factors in explaining ability to cope with disability.

Table 6.5 **Logistic regression models for ability to cope**

	Any disability		Any ADL disability		Any IADL disability	
	Coefficient (SE)	Adjusted percent	Coefficient (SE)	Adjusted percent	Coefficient (SE)	Adjusted percent
Income						
$0–$9,999		23.2		30.3		25.0
$10K–$19,000	–0.06 (0.10)	22.3	0.10 (0.14)	32.1	–0.05 (0.10)	24.0
$20K–$29,999	0.04 (0.11)	23.9	0.16 (0.16)	33.4	0.10 (0.11)	26.8
$30K–$39,999	–0.12 (0.15)	21.2	0.01 (0.19)	30.5	–0.06 (0.16)	23.9
$40K–$49,999	0.06 (0.18)	24.2	0.03 (0.26)	30.8	0.04 (0.16)	25.8
$50K +	0.16 (0.16)	26.0	0.43 (0.26)	38.7	0.17 (0.16)	28.2
Education						
Less than high school		20.9		27.3		24.4
Some high school	0.13 (0.10)	23.0	0.31 (0.14)*	33.1	0.06 (0.09)	25.5
High school graduate	0.11 (0.09)	22.6	0.44 (0.13)*	35.6	–0.06 (0.08)	23.5
Some college	0.35 (0.12)*	27.0	0.54 (0.21)*	37.5	0.20 (0.12)	28.2
College grad or higher	0.38 (0.12)*	27.6	0.19 (0.21)	30.8	0.26 (0.12)*	29.3
Male	0.01 (0.15)		–0.12 (0.27)		–0.11 (0.15)	
Age 70–74	0.22 (0.11)		–0.14 (0.20)		0.17 (0.12)	
Age 75–79	0.11 (0.13)		–0.07 (0.21)		0.04 (0.13)	
Age 80–84	0.14 (0.13)		0.03 (0.19)		0.18 (0.14)	
Age 85+	0.09 (0.14)		0.13 (0.19)		0.18 (0.14)	

(*continued*)

Table 6.5 (continued)

	Any disability		Any ADL disability		Any IADL disability	
	Coefficient (SE)	Adjusted percent	Coefficient (SE)	Adjusted percent	Coefficient (SE)	Adjusted percent
Age*sex						
70–74*male	–0.25 (0.19)		0.52 (0.32)		–0.29 (0.20)	
75–79*male	0.04 (0.21)		0.31 (0.33)		0.07 (0.21)	
80–84*male	0.05 (0.21)		–0.04 (0.33)		0.00 (0.22)	
85plus*male	–0.32 (0.22)		0.30 (0.35)		–0.24 (0.23)	
Widowed	0.07 (0.10)		0.34 (0.16)*		0.04 (0.10)	
Divorced/separated/single	–0.20 (0.14)		0.01 (0.21)		–0.19 (0.14)	
Marital status*sex						
Widowed*male	–0.01 (0.17)		–0.15 (0.26)		0.17 (0.17)	
Divorced/sep/single*male	0.13 (0.23)		0.19 (0.39)		0.31 (0.23)	
Black/other race	0.08 (0.11)		0.07 (0.17)		0.03 (0.11)	
Limitations						
IADL only	Ref		NA		NA	
1–2 ADLs	–0.31 (0.08)*		Ref		NA	
3 or more ADLs	–1.61 (0.16)*		–1.72 (0.14)*		NA	
3 or more IADLs	NA		NA		–0.86 (0.08)*	
N	5,868		2,266		5,557	

Notes: The definition of intrinsic ADL disability includes difficulty alone or without help or equipment; the definition for intrinsic IADL disability includes only difficulty alone or without help. These models include only respondents who reported intrinsic disability.

*$p < 0.05$.

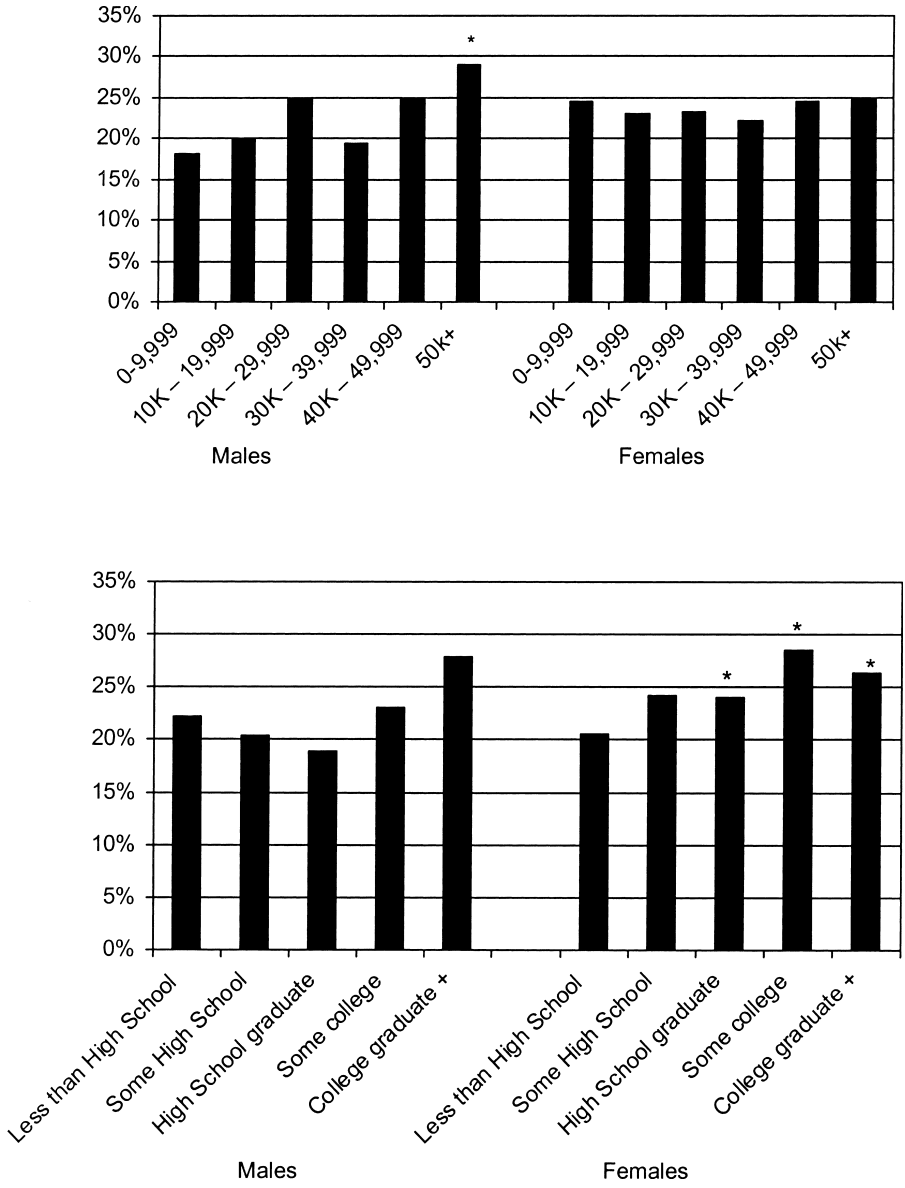

Fig. 6.6 Coping ability by gender, income, and education

Note: Estimates are adjusted for the age, race, marital status and severity of disability.

*Significantly different from lowest income or education category (p-value < 0.05)

We have also examined the impact of estimating models for disability, including income and education separately. Tables 6A.2 through 6A.7 in the appendix show the impact of income and education when the other variable is excluded from the model, for each of intrinsic disability (tables 6A.2 and 6A.3), residual disability (tables 6A.4 and 6A.5) and coping (tables 6A.6 and 6A.7) Comparing the Appendix tables to the equivalent regressions in tables 6.3 through 6.4 shows that for IADL disability, gradients in income and education are largely independent of each other. This may seem surprising but is relatively common in health studies, where income and education often pick up very different effects (Deaton and Paxson 2001). In the case of ADL disability, income by itself has an effect on disability that is almost entirely explained by education when both are included in the model. Income has very little effect on effective coping with disability, even in the absence of education in the model. Our results suggest that among the elderly, education is a more fundamental marker of socioeconomic status than is income (or at least income measured with error).[10] We present results with income and education included in the same equations throughout the rest of the chapter.

6.3 How Do the Better Educated Cope?

The central question raised by our results is how the better educated manage to cope with intrinsic disability. The first hypothesis we consider is that our results simply reflect difference in unmeasured health by educational attainment. While we examined residual disability in the subset of respondents with intrinsic disability and controlled for the number of reported limitations, it may be that more-educated respondents have less severe intrinsic disability that is more easily resolved.

We test this hypothesis by including an additional set of controls in our models, representing difficulty performing a set of seven physical tasks: lifting something as heavy as ten pounds (15 percent of the elderly report difficulty with this task), walking up ten steps without resting (19 percent), walking a quarter of a mile (25 percent), standing for about twenty minutes (18 percent), bending down from a standing position to pick up an object from the floor (17 percent), reaching up overhead or reaching out as if to shake someone's hand (8 percent), and using fingers to grasp or

10. This is in contrast to results presented by Agree (1999). Analyzing data from the 1993 AHEAD, she finds that residual disability among respondents with limitations in getting around inside the home has a nonlinear relationship with net worth, so that residual disability declines with net worth up to a certain point and then increases with increasing net worth. Education has a small and marginally significant relationship with residual disability.

Table 6.6 **Logistic regression models for ability to cope, including functional limitations**

	Any disability		ADL Only		IADL Only	
	Coefficient (SE)	Adjusted percent	Coefficient (SE)	Adjusted percent	Coefficient (SE)	Adjusted percent
Income						
$0–$9,999		23.8		30.8		25.4
$10K–$19,000	–0.09 (0.10)	22.2	0.05 (0.14)	31.7	–0.07 (0.10)	24.0
$20K–$29,999	–0.02 (0.11)	23.5	0.14 (0.16)	33.4	0.06 (0.11)	26.5
$30K–$39,999	–0.17 (0.16)	21.1	0.01 (0.19)	30.9	–0.08 (0.16)	23.9
$40K–$49,999	0.02 (0.17)	24.2	–0.03 (0.26)	30.3	0.03 (0.16)	25.9
$50K +	0.08 (0.17)	25.2	0.42 (0.27)	38.7	0.13 (0.16)	27.7
Education						
Less than high school		21.6		28.0		24.8
Some high school	0.10 (0.10)	23.2	0.27 (0.14)	33.0	0.04 (0.10)	25.6
High school graduate	0.05 (0.09)	22.4	0.39 (0.13)*	35.3	–0.08 (0.08)	23.4
Some college	0.27 (0.12)*	26.2	0.45 (0.20)*	36.4	0.16 (0.12)	27.8
College grad or higher	0.29 (0.13)*	26.6	0.14 (0.21)	30.5	0.20 (0.12)	28.6
N	5,868		2,266		5,557	

Notes: The definition of intrinsic ADL disability includes difficulty alone or without help or equipment; the definition for intrinsic IADL disability includes only difficulty alone or without help. These models include only respondents who reported intrinsic disability. Models all control for race, age*sex, sex*marital status, functional limitations, and the number of reported IADLs and ADLs. For any disability model, categorical variables for included 1–2 ADLs and 3 or more ADLs were included (IADL only was reference category). For the ADL and IADLs only models, dichotomous variables for 3 or more ADLs or 3 or more IADLs were included in the models, respectively.

*$p < 0.05$.

handle something (6 percent). The results from these models are presented in table 6.6.

Comparing estimated effects in tables 6.5 and 6.6, we find some evidence for this hypothesis, although it is not the whole explanation. For example, about a quarter of the difference between those with a college education in coping with IADL disability is explained by better underlying physical functioning, and the effect is no longer statistically significant. Better health explains less of the education differences in coping with ADL disability, but it is still some of it. Because we find that differences in physical functioning explain some of the observed gradient, we include controls for functional status in all future regressions.

Our second hypothesis concerns differences in the use of various coping strategies. The NHIS-D provides information on two broad coping strategies. The first strategy is getting help from other individuals. The survey asks respondents who report help from another person in completing an ADL or IADL task whether they received help from relatives or non relatives[11] and whether these helpers were paid.[12] We classify personal help into three groups: (1) help from a spouse, child, or parent, (2) other unpaid help, or (3) paid help.[13] The second strategy is to use assistive technologies. Respondents were asked about the use of special equipment to aid in ADL tasks.

Table 6.7 shows the use of various coping strategies used by those who report intrinsic disability in different domains. A vast majority of people (approximately 90 percent) with disability use at least one of the coping strategies. Overall, 64 percent of people with any ADL impairment use personal help—22 percent receiving help from a spouse, child, or parent, 21 percent using other unpaid help, and 25 percent using paid help—and 56 percent use assistive technology.

Coping strategies are very different across domains. Very few elderly use assistive technology to help with eating and dressing. For example, 81 percent of people with trouble eating use help from other people, and less than 10 percent use assistive technology. In contrast, approximately half of those with intrinsic disability in toileting or getting around inside use personal help, while over 60 percent use assistive technology.

Only questions about personal help are asked for people who report

11. The survey also distinguishes between household members and nonhousehold members.

12. Respondents are not asked about paid help if they report receiving help from a spouse, child, or parent only.

13. We initially considered unpaid help from relatives and nonrelatives separately. However, since only a small number of respondents report unpaid help from a nonrelative (4 percent and 6 percent of those with ADL and IADL disability, respectively), we combined the two categories.

Table 6.7 **Use of equipment and personal help among respondents with intrinsic disability, by ADL and IADL category**

	Equipment	Any personal help	Equipment and/or personal help
Activities of daily living (any) (n = 2266)	56.1	64.4	90.3
Bathing (n = 1835)	40.8	70.8	90.9
Getting around inside (n = 1025)	61.6	49.0	87.0
Dressing (n = 1066)	5.0	84.9	86.4
Transferring (n = 995)	28.3	60.9	74.6
Toileting (n = 881)	60.9	54.7	91.0
Eating (n = 336)	9.5	81.1	84.6
Instrumental activities of daily living (any)	N/A	88.4	88.4
Heavy housework (n = 5,274)	N/A	86.6	86.6
Shopping (n = 2,399)	N/A	91.3	91.3
Light housework (n = 1,765)	N/A	87.1	87.1
Preparing meals (n = 1,432)	N/A	86.9	86.9
Managing money (n = 1,155)	N/A	92.5	92.5
Using the telephone (n = 596)	N/A	82.8	82.8

IADL disability. Across domains, reported use of help is high, ranging from 83 percent for using the telephone to 93 percent for managing money.

Coping strategies also differ by SES group.[14] Tables 6.8 and 6.9 show regression results for the use of different coping strategies by income and education, and figures 6.7 and 6.8 display adjusted percentages of people using each type of help. The use of any personal help for ADL disability increases with income. Use of personal help is sixteen percentage points higher (76 percent versus 60 percent) in the group with income above $50,000 than the group with income below $10,000 (data not shown). Despite their higher incomes, the rich use paid help much less than the poor for both ADL and IADL disabilities. But they offset the reduced use of paid help with substantially more help from close relatives. This is consistent with the "strategic bequest" model of Bernheim, Shleifer, and Sum-

14. The prior literature on the effect of income and education on uses and types of assistance is mixed (see Agree, Freedman, and Sengupta 2004 and references there in). Most of this literature suggests that the predominant factor in determining use of assistance and types of assistance among those who use some assistance is need (i.e., severity and number of limitations and other measures of underlying health). For example, Verbrugge and Sevak (2002) found that need characteristics, such as degree of difficulty and number of limitations, explained 27 percent of the variation in use of assistance among those with ADL disability, while predisposing and enabling characteristics, such as age, race, marital status, education, and income explained only 6 percent of variation in use of assistance. Similarly, Mathieson, Kronenfeld, and Keith (2002) found that need characteristics explained 15 percent of variation in use of equipment among those with ADL and IADL limitations, while enabling characteristics explained only 2 percent of variance.

Table 6.8 **Logistic regression models for use of equipment and help for "any ADL," conditioned on reported intrinsic ADL disability**

	Model 1: Any equipment	Model 2: Any help from spouse, child, or or parent	Model 3: Any paid help	Model 4: Any other unpaid help	Model 5: Any type of personal help	Model 6: Any type of personal help and/or equipment
Income						
$0–$9,999						
$10K–$19,000	0.01	0.57	–0.30	0.17	0.13	0.15
	(0.12)	(0.17)*	(0.16)	(0.16)	(0.15)	(0.21)
$20K–$29,999	–0.19	0.85	–0.40	0.06	0.17	0.14
	(0.15)	(0.19)*	(0.17)*	(0.19)	(0.15)	(0.25)
$30K–$39,999	–0.04	0.90	–0.32	0.38	0.39	0.44
	(0.18)	(0.23)*	(0.20)	(0.20)	(0.21)	(0.35)
$40K–$49,999	0.03	1.28	–0.87	0.30	0.63	0.40
	(0.23)	(0.28)*	(0.28)*	(0.25)	(0.25)*	(0.40)
$50K +	–0.32	1.10	–0.55	0.56	0.85	0.14
	(0.21)	(0.26)*	(0.23)*	(0.23)*	(0.22)*	(0.30)
Education						
Less than high school						
Some high school	0.35	–0.36	–0.10	–0.49	–0.49	–0.09
	(0.13)*	(0.19)	(0.15)	(0.16)*	(0.16)*	(0.21)
High school graduate	0.49	–0.36	0.22	–0.45	–0.26	0.06
	(0.12)*	(0.15)*	(0.15)	(0.15)*	(0.14)	(0.21)
Some college	0.61	–0.74	0.34	–0.30	–0.49	0.22
	(0.17)*	(0.22)*	(0.20)	(0.20)	(0.19)*	(0.32)
College grad +	0.42	–0.99	0.40	–0.25	–0.65	–0.13
	(0.17)*	(0.25)*	(0.20)*	(0.23)	(0.21)*	(0.28)
Average use (%)	56.1	22.1	25.3	21.3	64.4	30.2
N	2,266	2,266	2,266	2,266	2,266	2,266

Notes: Models control for race, age*sex, sex*marital status, functional limitations, and whether respondents report difficulty with 3 or more ADLs.

*$p < 0.05$.

mers (1985); the possibility of an inheritance may spur children of better-off parents to provide more direct assistance (of course, other hypotheses are possible as well). Use of assistive technologies for help with ADL disability is relatively independent of income.

The pattern is the reverse for education. The better educated use more paid help than the less educated, but receive less help from close relatives. All told, the better educated use less personal care than the less educated (particularly for ADL tasks). For ADL tasks, the better educated offset their lower use of personal care with substantially higher rates of use of assistive technologies. On net, use of any form of help is high among all respondents and roughly equal by education and income.

The important question is how differential use of these technologies is

Table 6.9 **Logistic regression models for use of help for "any IADL," conditioned on reporting intrinsic IADL disability**

	Model 1: Any help from spouse, child, or parent	Model 2: Any paid help	Model 3: Any unpaid help	Model 4: Any help
Income				
$0–$9,999				
$10K–$19,000	0.25 (0.08)*	–0.19 (0.09)*	–0.13 (0.09)	–0.10 (0.14)
$20K–$29,999	0.20 (0.10)	–0.29 (0.11)*	–0.27 (0.11)*	–0.27 (0.15)
$30K–$39,999	0.55 (0.14)*	–0.41 (0.14)*	–0.32 (0.14)*	–0.11 (0.20)
$40K–$49,999	0.60 (0.16)*	–0.51 (0.18)*	–0.34 (0.18)	0.21 (0.28)
$50K +	0.59 (0.15)*	–0.52 (0.15)*	–0.40 (0.14)*	–0.19 (0.23)
Education				
Less than high school				
Some high school	–0.34 (0.10)*	0.36 (0.10)*	0.10 (0.10)	–0.11 (0.13)
High school graduate	–0.43 (0.08)*	0.63 (0.08)*	–0.07 (0.09)	–0.19 (0.11)
Some college	–0.83 (0.13)*	1.08 (0.11)*	–0.12 (0.12)	0.09 (0.18)
College grad +	–1.35 (0.16)*	1.30 (0.12)*	0.05 (0.13)	–0.05 (0.16)
Average use	25.49	29.90	27.31	88.44
N	5,557	5,557	5,557	5,557

Notes: Models all control for race, age*sex, sex*marital status, functional limitations, and whether respondent reports difficulty with 3 or more IADLs.

*$p < 0.05$.

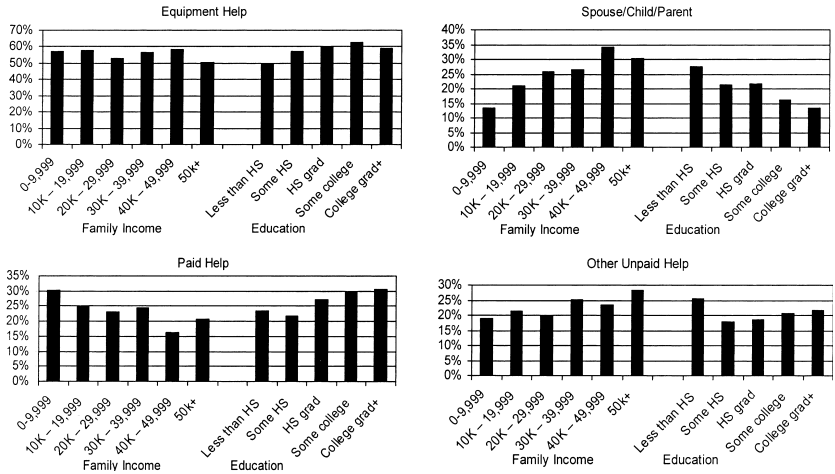

Fig. 6.7 **Use of help by income and education among respondents reporting intrinsic ADL disability**

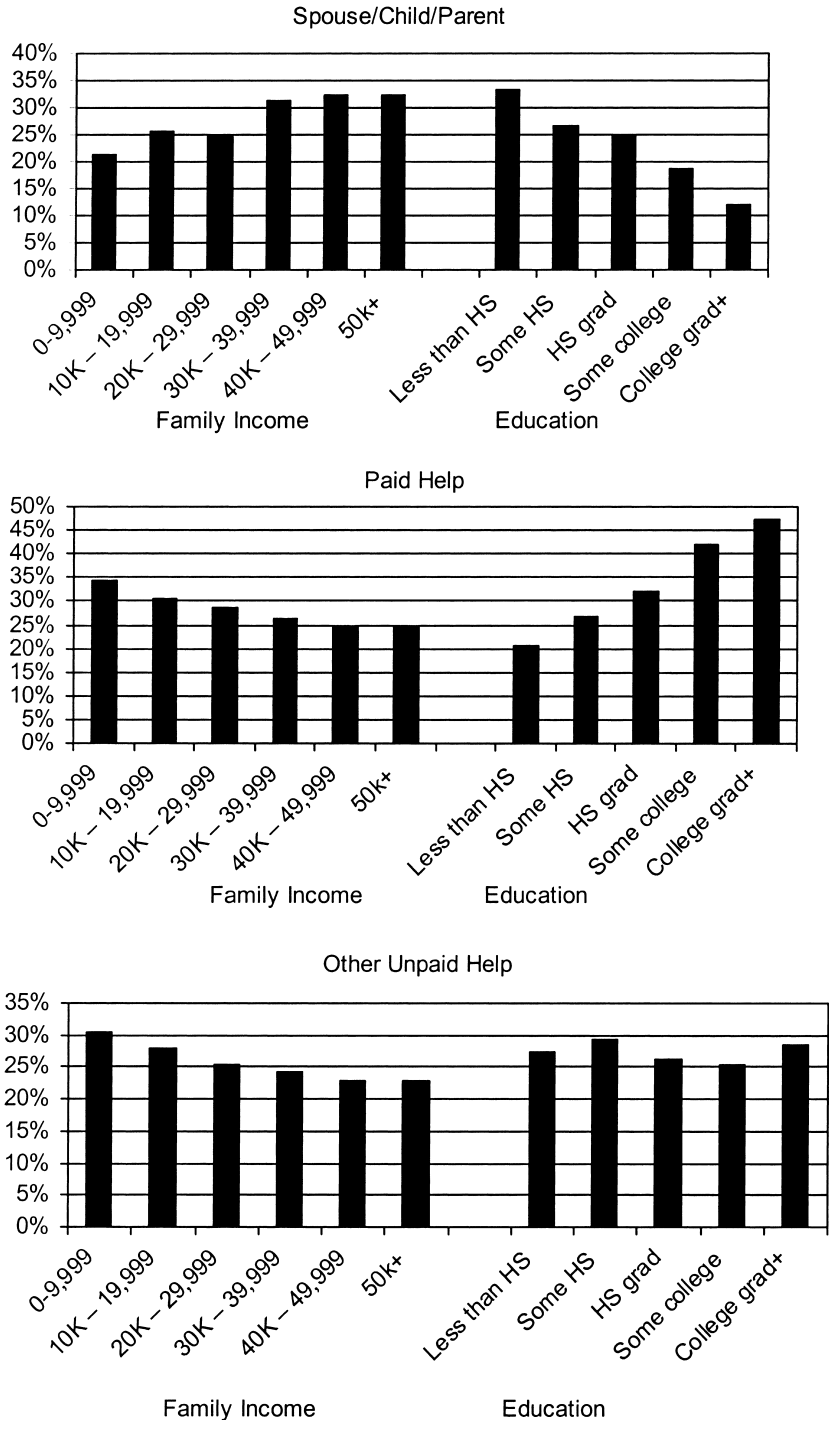

Fig. 6.8 Use of help by income and education among respondents reporting intrinsic IADL disability

Table 6.10 **Logistic regression models for ADL coping, including covariates for use of equipment and help**

	Coefficient (SE)	Adjusted percent	Coefficient (SE)	Adjusted percent
Income				
$0–$9,999		34.3		34.9
$10K–$19,000	0.05 (0.15)	35.1	0.01 (0.16)	35.1
$20K–$29,999	0.18 (0.17)	37.5	0.13 (0.18)	37.2
$30K–$39,999	–0.10 (0.21)	32.4	–0.13 (0.21)	32.5
$40K–$49,999	–0.03 (0.27)	33.8	–0.06 (0.28)	33.8
$50K +	0.45 (0.28)	42.6	0.34 (0.29)	41.0
Education				
Less than high school	-	31.3	-	30.7
Some high school	0.28 (0.15)	36.3	0.32 (0.16)*	36.3
High school graduate	0.42 (0.14)*	38.9	0.48 (0.14)*	39.3
Some college	0.46 (0.21)*	39.7	0.51 (0.22)*	39.7
College grad or higher	0.18 (0.22)	34.5	0.27 (0.22)	35.4
Equipment and help				
AT only			0.10 (0.25)	
Spouse, child, parent help only			0.04 (0.29)	
Paid help only			–0.16 (0.31)	
Unpaid help only				
Multiple types of help			1.05 (0.29)*	
AT and any help			–0.16 (0.25)	
N	2,045		2,045	

Notes: These models include only respondents who reported intrinsic disability and use of either help and/or AT. Models all control for race, age*sex, sex*marital status, functional limitations, and whether respondents report difficulty with 3 or more ADLs.

*$p < 0.05$.

related to the ability to cope with impairment. We examine this issue by including measures of personal and assistive technology use in the equations for ability to cope with disability. Since respondents who use neither personal help nor equipment but report difficulty by definition have residual disability, we focus on the subset of respondents who use some kind of help (either personal or equipment). This omits only about 10 percent of the sample.[15]

The results of this analysis are shown in table 6.10 for ADL impairment and table 6.11 for IADL impairment. We report estimated effects without controlling for use of equipment and personal help in the first two columns in each table. These results differ from those reported in table 6.6 because of the restriction to the sample of respondents who use either personal help

15. There is unlikely to be any bias from this, as the analysis reported in the last columns of tables 6.8 and 6.9 already demonstrated that education had little effect on whether respondents used any help.

Table 6.11 **Logistic regression models for IADL coping, including covariates for use of equipment and help**

	Coefficient (SE)	Adjusted percent	Coefficient (SE)	Adjusted percent	Coefficient (SE)	Adjusted percent
Income						
$0–$9,999		28.2		27.5		27.5
$10K–$19,000	–0.06 (0.10)	27.0	0.02 (0.11)	27.9	0.03 (0.11)	28.0
$20K–$29,999	0.14 (0.12)	30.8	0.20 (0.12)	30.8	0.19 (0.12)	30.7
$30K–$39,999	–0.05 (0.16)	27.2	0.03 (0.17)	28.0	0.03 (0.17)	28.0
$40K–$49,999	–0.01 (0.17)	28.0	0.05 (0.18)	28.4	0.04 (0.18)	28.2
$50K +	0.17 (0.17)	31.5	0.27 (0.17)	32.1	0.26 (0.17)	32.0
Education						
Less than high school		27.8		29.1		29.0
Some high school	0.05 (0.10)	28.7	–0.00 (0.11)	29.0	–0.00 (0.11)	29.0
High school graduate	–0.04 (0.09)	27.0	–0.11 (0.09)	27.2	–0.11 (0.10)	27.2
Some college	0.14 (0.12)	30.6	0.02 (0.14)	29.3	0.02 (0.14)	29.4
College grad or higher	0.21 (0.13)	32.0	0.08 (0.13)	30.5	0.09 (0.13)	30.5
Help						
Spouse, child, parent help only			–0.27 (0.13)*		–0.28 (0.13)*	
Paid help only			–0.07 (0.13)		–0.07 (0.13)	
Unpaid help only						
Multiple types of help			1.59 (0.13)*		1.59 (0.13)*	
Mobility aids						
Cane or crutch					–0.10 (0.09)	
Walker					–0.11 (0.13)	
Manual wheelchair					0.03 (0.15)	
Electric wheelchair or scooter					0.70 (0.33)*	
Brace					–0.21 (0.16)	
N	4,905		4,905		4,905	

Notes: These models include only respondents who reported intrinsic disability and use of help. Models all control for race, age*sex, sex*marital status, functional limitations, and whether respondents report difficulty with 3 or more IADLs.

*$p < 0.05$.

or equipment. For these models we use mutually exclusive categories for the type of help received. For ADL disability these categories are equipment only (29 percent), help from a spouse, child, or parent only (14 percent), other unpaid help only (6 percent), paid help only (8 percent), multiple types of personal help (9 percent), and use of equipment and personal help (30 percent). For IADL disability the categories are help from a spouse, child, or parent only (29 percent), other unpaid help only (18 percent), paid help only (24 percent), and multiple types of personal help (30 percent). In each case, the omitted category in the regression models is other unpaid help only. Relative to this category, people who use multiple types of personal help are better able to cope with both ADL and IADL

disability. Help from a close relative is also less effective than other unpaid help for coping with IADL disability, perhaps reflecting the fact that family members who have less formal knowledge and training with disabled people are less effective at helping to resolve disability.

Surprisingly, including measures of use of personal and assistive technologies does not affect the income or education coefficients in any material way. Comparing the two columns in table 6.10 shows that the coefficients on the higher-education groups are somewhat larger in the models with all of the help variables included, as in the models without the help variables. For example, the gap in coping with ADLs between those with some college and those with less than a high school degree is 8.4 percent without the measures of help and 9.0 percent with measures of help. Controlling for the types of help received for IADL disability (reported in table 6.11) explains more of the relationship between education and coping. However, these effects were small and not statistically significant, even in the absence of controls for types of help received.

The NHIS-D did not ask about the use of equipment to aid IADL tasks but did ask all respondents (regardless of whether they reported disability) about use of specific mobility aids, including a cane or crutch, a walker, a manual wheelchair, an electric wheelchair or scooter, or a brace. In the fifth and sixth columns of table 6.11, we present a model that also controls for the use of these specific mobility aids. While use of an electric wheelchair or scooter was a more effective coping strategy than other mobility aids (or the use of no mobility aids), use of specific technologies does not have any additional explanatory power once we control for differences in the types of personal help received.

Because both the use of coping strategies and their effectiveness may vary by gender, we also examined coping controlling for the use of help separately in men and women. Table 6.12 shows rates of use of various coping strategies by gender. Over 50 percent of men and women use equipment for ADL tasks. Men are more likely to get personal help with ADL tasks (69 percent versus 62 percent), particularly help from a spouse, child, or parent (31 percent versus 18 percent). However, women are more likely to obtain paid help than men (28 percent versus 21 percent), and there are few differences in use of other unpaid help for ADL tasks. For IADL tasks, differences across gender in help from family members and paid help are smaller. For example, 27 percent of men obtain help from a spouse, child, or parent for IADLs, compared to 25 percent for women. However, women are more likely to use other unpaid help for IADL tasks, compared to men (29 percent versus 24 percent).

We present analysis of coping ability by gender in tables 6A.8–6A.11 in the appendix. There is little evidence that the effectiveness of coping strategies varies by gender. In addition, patterns observed in combined samples generally hold in each gender. For example, in both men and women, ad-

Table 6.12 **Use of equipment and personal help among respondents with intrinsic disability, by any ADL and any IADL category, separately for men and women***

	Men		Women	
	Any ADL	Any IADL	Any ADL	Any IADL
Any equipment	54.6		56.8	
Any personal help	69.3	87.5	62.0	88.9
Spouse/child/parent	31.0	27.4	17.7	24.6
Paid	20.5	28.1	27.7	30.7
Other unpaid	21.2	24.2	21.3	28.7
Either equipment or personal help	91.5		89.7	
N	751	1,729	1,515	3,828

*Categories are not mutually exclusive

justing for types of help increases differences by education in coping with ADL limitations.

Because both coping strategies and the size of the education gradient in coping vary according to specific activity, we also examined whether coping strategies explained task-specific education gradients. We examined four particular ADL and IADL restrictions: difficulty getting around inside and dressing (both ADL impairments), and difficulty shopping and doing light housework (IADL impairments). Two of these impairments seem particularly amenable to help from assistive technology, particularly mobility aids—getting around inside and shopping. The other two are activities where there are strong education gradients in coping ability, shown in figures 6.4 and 6.5.

Table 6.13 shows the impact of coping strategies on coping with these two ADL difficulties and table 6.14 shows comparable results for the IADL difficulties. In each case, the first two columns report results without the coping measures and the next two columns displays results controlling for the coping measures.[16] Once again, use of coping strategies does not explain the better coping of higher-education groups with specific ADL or IADL tasks. Surprisingly, type of coping strategy or use of specific mobility aids had little effect on ability to cope with specific task, and thus had little effect on the impact of education and income.

16. Questions about the type of help received were not asked in regard to specific tasks, so we cannot differentiate between respondents who use multiple types of help for each of their limitations from a respondent who uses paid help for some tasks and gets help from a spouse for other. Thus, for ADL disability we collapse our categories for type of help into equipment and personal help, equipment only, and personal help only. In addition, since respondents with IADL disability were not asked about equipment help, we control for specific mobility aids in models examining specific IADL tasks.

Table 6.13 **Logistic regression models for coping for getting around inside and dressing, including covariates for use of equipment and help**

	Getting around inside				Dressing			
	Coefficient (SE)	Adjusted percent	Coefficient (SE)	Adjusted percent	Coefficient (SE)	Adjusted percent	Coefficient (SE)	Adjusted percent
Income								
$0–$9,999		33.6		33.6		34.6		34.4
$10K–$19,000	–0.13 (0.22)	31.1	–0.13 (0.22)	31.2	0.32 (0.23)	41.2	0.32 (0.23)	41.0
$20K–$29,999	–0.44 (0.28)	25.6	–0.43 (0.28)	25.7	0.30 (0.27)	40.7	0.31 (0.27)	40.9
$30K–$39,999	–0.15 (0.31)	30.7	–0.15 (0.31)	30.7	–0.04 (0.30)	33.9	0.02 (0.30)	34.9
$40K–$49,999	–0.59 (0.43)	23.2	–0.61 (0.43)	22.9	–0.67 (0.45)	22.5	–0.66 (0.44)	22.7
$50K +	0.23 (0.33)	38.3	0.23 (0.33)	38.2	0.51 (0.30)	45.4	0.53 (0.31)	45.6
Education								
Less than high school		27.3		27.1		32.2		31.9
Some high school	0.37 (0.23)	34.2	0.40 (0.23)	34.5	0.51 (0.21)*	42.7	0.52 (0.21)*	42.5
High school graduate	0.18 (0.21)	30.6	0.19 (0.22)	30.6	0.24 (0.20)	37.0	0.28 (0.20)	37.5
Some college	0.49 (0.32)	36.5	0.52 (0.33)	36.9	0.45 (0.28)	41.3	0.46 (0.28)	41.2
College grad +	0.20 (0.34)	30.8	0.20 (0.34)	30.7	0.99 (0.28)*	53.4	1.03 (0.28)*	53.8
Equipment and help								
Equipment and help								
Equipment only			0.17 (0.27)				0.59 (0.75)	
Help only			0.34 (0.27)				0.94 (0.41)*	
N	890		890		924		924	

Notes: These models include only respondents who reported intrinsic disability and use of either help and/or AT. Models all control for race, age*sex, sex*marital status, functional limitations, and whether respondents report difficulty with 3 or more ADLs.

*$p < 0.05$.

Table 6.14 **Logistic regression models for coping for shopping and light housework, including covariates for specific mobility aids**

	Shopping				Light housework			
	Coefficient (SE)	Adjusted percent	Coefficient (SE)	Adjusted percent	Coefficient (SE)	Adjusted percent	Coefficient (SE)	Adjusted percent
Income								
$0–$9,999		33.6		33.6		25.9		25.7
$10K–$19,000	0.06 (0.13)	34.8	0.06 (0.13)	34.9	0.23 (0.17)	30.4	0.24 (0.17)	30.4
$20K–$29,999	0.13 (0.16)	36.4	0.12 (0.16)	36.2	0.41 (0.20)*	34.3	0.43 (0.20)*	34.4
$30K–$39,999	0.31 (0.19)	40.3	0.30 (0.19)	40.1	0.26 (0.24)	31.0	0.27 (0.24)	31.0
$40K–$49,999	–0.16 (0.22)	30.3	–0.19 (0.22)	29.9	0.44 (0.27)	34.8	0.46 (0.27)	35.1
$50K +	–0.07 (0.21)	32.1	–0.09 (0.21)	31.8	0.33 (0.25)	32.5	0.32 (0.25)	31.9
Education								
Less than high school		34.7		34.6		28.7		28.7
Some high school	0.06 (0.15)	35.9	0.05 (0.16)	35.7	0.10 (0.17)	30.6	0.09 (0.17)	30.5
High school graduate	–0.03 (0.13)	34.1	–0.02 (0.13)	34.2	0.10 (0.15)	30.7	0.10 (0.15)	30.7
Some college	0.01 (0.20)	34.8	0.02 (0.20)	34.9	0.12 (0.22)	31.1	0.14 (0.23)	31.5
College grad +	–0.04 (0.22)	33.7	–0.04 (0.22)	33.7	0.23 (0.23)	33.4	0.22 (0.24)	33.2
Mobility Aids								
Cane or crutch			–0.18 (0.10)				0.06 (0.11)	
Walker			0.04 (0.11)				–0.20 (0.14)	
Manual wheelchair			0.07 (0.14)				–0.02 (0.16)	
Electric wheelchair or scooter			0.49 (0.34)				0.56 (0.39)	
Brace			–0.26 (0.23)				–0.01 (0.25)	
N	2,187		2,187		1,534		1,534	

Notes: These models include only respondents who reported intrinsic disability and use of either help and/or AT. Models all control for race, age*sex, sex*marital status, functional limitations, and whether respondents reported difficulty with 3 or more IADLs.

*$p < 0.05$.

6.4 Conclusion

Analyses of socioeconomic gradients in health are notoriously difficult, and ours turns out to be complex as well. We show that the better educated are better able to cope with underlying disability than the less educated. These differences are large: the ability to cope with disease varies by as much as eight percentage points across education groups. We also show that the type of help differently educated groups receive is different. The better educated are more likely to use assistive technologies than the less educated and are more likely to receive paid help than help from close relatives. Despite our best attempts, however, we are unable to show that it is the use of these different forms of aids that explains differences in the ability to cope.

With the data that we have, we cannot examine this puzzle more completely. But there are several hypotheses that might be tested using other data. One hypothesis is that the more educated use care more intensively. For example, among users of paid help, the less educated might use two hours of paid care per week, while the better educated might use four hours. The additional two hours could substantially reduce impairment, but we cannot determine that with our data. Several other researchers have observed sociodemographic differences in the intensity of personal care. For example, Weiss et al. (2005) analyzed data from the 1993 AHEAD and found that Hispanics received more hours of informal care per week than African Americans and non-Hispanic whites. Kemper (1992), in a small study of highly disabled individuals, found that income was positively associated with both the likelihood of receiving paid help and the number of hours of help among users of paid help. Those who completed high school were also more likely to use paid help, but not more hours of help conditioning on using any paid help.

A related hypothesis is that the quality of the care received might be higher for the more educated compared to the less educated. The personal help received could be better trained and the equipment might be newer or less subject to failure.

A third hypothesis is that the more educated may be more willing or able to use behavior and environmental modifications to cope with their disability. For example, the more educated might be more likely to cope with difficulty in preparing meals by buying prepared foods, or they might be more able to make home modifications that allow them to function with their disability. Few surveys collect data on the use of behavior modifications and environmental adaptations. Norburn et al. (1995), analyzed data from the 1991 National Survey of Self-Care and Aging and estimated that 75 percent of the community elderly coped with their loss of functioning by changing their behavior, while one third made adaptations in their environment. Surprisingly, they found that these coping strategies were not

associated with income or education. Similarly, Mathieson, Kronenfeld, and Keith (2002), analyzing the National Survey of Self-Care and Aging, found that household income and education were not related to the likelihood of making home modifications, although subjective measures of resources, such as reporting having enough income to buy little extras, did increase the likelihood of making home modifications.

A final hypothesis is that the environments that the more educated live in are more conducive to the use of technology or personal aids. If the better educated live in homes or shop in stores where there is more space, ramps, and elevators, use of a wheelchair may be able to fully resolve the underlying impairment. That might be less true in a crowded house or a store with narrow aisles and steps. Data on the specific physical features of the home or environment are limited. However, Gitlin et al. (2001) reported an average of thirteen environmental problems in a small study of approximately 300 elderly. Similarly, analyzing data from the 1995 American Housing Survey, Sandra Newman (2003) found that 23 percent of elderly individuals had unmet needs for housing modifications, and the number of reported unmet needs was negatively associated with household income.

In summary, we find that while the majority of socioeconomic differences in disability can be attributed to differences in underlying functioning—the better off have much less difficulty with these measures, even in the absence of help—coping is important as well. In addition, while we find differences in the way people receive help with functional limitations across educational and income groups, these differences do not explain the education gradient in coping. More work is needed to disentangle the complex interrelationships between underlying functional limitations, coping strategies, and the environment in which people live in order to further understand how the better educated are better able to cope with underlying disability.

Appendix

Table 6A.1 Logistic regression models for ability to cope by sex

	Any disability: Men		Any disability: Women	
	Coefficient (SE)	Adjusted percent	Coefficient (SE)	Adjusted percent
Income				
$0–$9,999		18.2		24.6
$10K–$19,000	0.11 (0.20)	19.9	–0.09 (0.11)	23.0
$20K–$29,999	0.41 (0.22)	24.9	–0.08 (0.13)	23.2
$30K–$39,999	0.08 (0.28)	19.4	–0.14 (0.17)	22.2
$40K–$49,999	0.40 (0.30)	24.7	–0.01 (0.20)	2445
$50K +	0.63 (0.28)*	29.0	0.00 (0.18)	24.7
Education				
Less than high school		22.2		20.5
Some high school	–0.11 (0.19)	20.4	0.22 (0.12)	24.2
High school graduate	–0.21 (0.18)	18.9	0.21 (0.10)*	24.1
Some college	0.05 (0.23)	23.0	0.46 (0.15)*	28.6
College grad or higher	0.31 (0.24)	27.8	0.34 (0.16)*	26.4
Age				
70–74	0.00 (0.16)		0.23 (0.12)*	
75–79	0.14 (0.18)		0.13 (0.13)	
80–84	0.14 (0.18)		0.18 (0.13)	
85 plus	–0.29 (0.19)		0.13 (0.14)	
Marital status				
Widowed	0.08 (0.15)		0.04 (0.10)	
Div/sep	0.02 (0.20)		–0.21 (0.15)	
Race				
Black/other race	0.04 (0.20)		0.11 (0.13)	
Severity of limitations				
1–2 ADLs	–0.12 (0.15)		–0.39 (0.10)*	
3 or more ADLs	–1.32 (0.24)*		–1.73 (0.18)*	
N	1865		4003	

Notes: The definition of intrinsic ADL disability includes difficulty alone or without help or equipment; the definition for intrinsic IADL disability includes only difficulty alone or without help. These models include only respondents who reported intrinsic disability. Reference groups for age, marital status, race, and severity of limitations are age 65–59, married respondents, white respondents, and respondents reporting only IADL disability, respectively.
*$p < 0.05$.

Table 6A.2 **Logistic regression models for intrinsic disability, income only**

	Any disability		Any ADL		Any IADL	
Independent variable	Coefficient (SE)	Adjusted percent	Coefficient (SE)	Adjusted percent	Coefficient (SE)	Adjusted percent
Income						
$0–$9,999		29.8		11.1		27.8
$10K–$19,000	–0.28 (0.05)*	24.6	–0.27 (0.06)*	8.9	–0.26 (0.05)*	23.2
$20K–$29,999	–0.38 (0.06)*	23.1	–0.23 (0.08)*	9.2	–0.34 (0.06)*	22.0
$30K–$39,999	–0.44 (0.07)*	22.0	–0.27 (0.10)*	8.8	–0.40 (0.07)*	21.0
$40K–$49,999	–0.31 (0.08)*	24.1	–0.24 (0.11)*	9.0	–0.28 (0.08)*	22.9
$50K +	–0.59 (0.07)*	19.8	–0.36 (0.11)*	8.2	–0.55 (0.07)*	18.7
N	24,476		24,476		24,476	

Notes: The definition of intrinsic ADL disability includes difficulty alone or without help or equipment; the definition for intrinsic IADL disability includes only difficulty alone or without help. Individuals missing values for educational attainment ($n = 295$) and/or marital status ($n = 25$) were dropped from regression analyses.

*$p < 0.05$.

Table 6A.3 **Logistic regression models for intrinsic disability, education only**

	Any disability		Any ADL		Any IADL	
Independent variable	Coefficient (SE)	Adjusted percent	Coefficient (SE)	Adjusted percent	Coefficient (SE)	Adjusted percent
Education						
Less than high school		28.8		11.4		27.0
Some high school	–0.10 (0.05)*	26.9	–0.08 (0.07)	10.7	–0.09 (0.05)	25.5
High school graduate	–0.29 (0.04)*	23.5	–0.31 (0.06)*	8.7	–0.29 (0.05)*	22.1
Some college	–0.48 (0.06)*	20.6	–0.47 (0.09)*	7.6	–0.46 (0.06)*	19.5
College grad or higher	–0.49 (0.06)*	20.5	–0.64 (0.09)*	6.6	–0.44 (0.07)*	19.8
N	24,476		24,476		24,476	

Notes: The definition of intrinsic ADL disability includes difficulty alone or without help or equipment; the definition for intrinsic IADL disability includes only difficulty alone or without help. Individuals missing values for educational attainment ($n = 295$) and/or marital status ($n = 25$) were dropped from regression analyses.

*$p < 0.05$.

Table 6A.4 **Logistic regression models for residual disability, income only**

	Any disability		Any ADL		Any IADL	
Independent variable	Coefficient (SE)	Adjusted percent	Coefficient (SE)	Adjusted percent	Coefficient (SE)	Adjusted percent
Income						
$0–$9,999		22.9		7.8		20.9
$10K–$19,000	–0.24 (0.05)*	19.1	–0.28 (0.07)*	6.1	–0.22 (0.05)*	17.7
$20K–$29,999	–0.36 (0.06)*	17.5	–0.29 (0.09)*	6.0	–0.34 (0.07)*	16.1
$30K–$39,999	–0.38 (0.08)*	17.2	–0.27 (0.11)*	6.1	–0.36 (0.08)*	15.8
$40K–$49,999	–0.32 (0.09)*	18.0	–0.19 (0.13)	6.6	–0.30 (0.10)*	16.6
$50K +	–0.60 (0.08)*	14.4	–0.52 (0.15)*	4.9	–0.58 (0.09)*	13.2
N	24,476		24,476		24,476	

Notes: The definition of intrinsic ADL disability includes difficulty alone or without help or equipment; the definition for intrinsic IADL disability includes only difficulty alone or without help. Individuals missing values for educational attainment ($n = 295$) and/or marital status ($n = 25$) were dropped from regression analyses.

*$p < 0.05$.

Table 6A.5 **Logistic regression models for residual disability, education only**

	Any disability		Any ADL		Any IADL	
Independent variable	Coefficient (SE)	Adjusted percent	Coefficient (SE)	Adjusted percent	Coefficient (SE)	Adjusted percent
Education						
Less than high school		22.8		8.4		20.6
Some high school	–0.13 (0.05)*	20.7	–0.19 (0.08)*	7.1	–0.11 (0.05)*	19.0
High school graduate	–0.30 (0.05)*	18.2	–0.43 (0.08)*	5.7	–0.27 (0.05)*	16.8
Some college	–0.54 (0.06)*	15.0	–0.66 (0.11)*	4.6	–0.50 (0.06)*	13.9
College grad or higher	–0.58 (0.07)*	14.6	–0.70 (0.10)*	4.5	–0.52 (0.07)*	13.7
N	24,476		24,476		24,476	

Notes: The definition of intrinsic ADL disability includes difficulty alone or without help or equipment; the definition for intrinsic IADL disability includes only difficulty alone or without help. Individuals missing values for educational attainment ($n = 295$) and/or marital status ($n = 25$) were dropped from regression analyses.

*$p < 0.05$.

Table 6A.6 **Logistic regression models for coping, income only**

	Any disability		Any ADL		Any IADL	
Independent variable	Coefficient (SE)	Adjusted percent	Coefficient (SE)	Adjusted percent	Coefficient (SE)	Adjusted percent
Income						
$0–$9,999		22.4		29.3		24.6
$10K–$19,000	–0.02 (0.09)	22.1	0.15 (0.14)	32.2	–0.04 (0.10)	23.9
$20K–$29,999	0.11 (0.11)	24.3	0.25 (0.16)	34.0	0.12 (0.11)	26.9
$30K–$39,999	–0.02 (0.15)	22.1	0.11 (0.19)	31.3	–0.00 (0.15)	24.6
$40K–$49,999	0.16 (0.17)	25.2	0.11 (0.27)	31.4	0.10 (0.16)	26.4
$50K +	0.28 (0.15)	27.4	0.52 (0.24)*	39.5	0.24 (0.15)	29.2
N	5,868		2,266		5,557	

Notes: The definition of intrinsic ADL disability includes difficulty alone or without help or equipment; the definition for intrinsic IADL disability includes only difficulty alone or without help. Individuals missing values for educational attainment ($n = 295$) and/or marital status ($n = 25$) were dropped from regression analyses.

*$p < 0.05$.

Table 6A.7 **Logistic regression models for coping, education only**

	Any disability		Any ADL		Any IADL	
Independent variable	Coefficient (SE)	Adjusted percent	Coefficient (SE)	Adjusted percent	Coefficient (SE)	Adjusted percent
Education						
Less than high school		20.7		26.9		24.2
Some high school	0.13 (0.10)	22.9	0.33 (0.14)*	32.9	0.06 (0.09)	25.4
High school graduate	0.11 (0.08)	22.6	0.47 (0.13)*	35.7	–0.04 (0.08)	23.5
Some college	0.36 (0.12)*	27.0	0.58 (0.20)*	37.9	0.21 (0.11)	28.3
College grad or higher	0.41 (0.11)*	28.1	0.27 (0.20)	31.7	0.29 (0.11)*	29.9
N	5,868		2,266		5,557	

Notes: The definition of intrinsic ADL disability includes difficulty alone or without help or equipment; the definition for intrinsic IADL disability includes only difficulty alone or without help. Individuals missing values for educational attainment ($n = 295$) and/or marital status ($n = 25$) were dropped from regression analyses.

*$p < 0.05$.

Table 6A.8 **Logistic regression models for ADL coping among males only, including covariates for use of equipment and help**

	ADL only: Men			
	Coefficient (SE)	Adjusted percent	Coefficient (SE)	Adjusted percent
Income				
$0–$9,999		33.4		33.4
$10K–$19,000	–0.13 (0.29)	31.2	–0.09 (0.30)	31.9
$20K–$29,999	0.14 (0.35)	35.9	0.14 (0.36)	35.8
$30K–$39,999	0.03 (0.44)	33.9	0.08 (0.44)	34.8
$40K–$49,999	0.70 (0.45)	46.3	0.61 (0.48)	44.1
$50K +	0.24 (0.45)	37.6	0.14 (0.44)	35.8
Education				
Less than high school		30.3		29.3
Some high school	0.40 (0.25)	37.3	0.40 (0.26)	36.0
High school graduate	0.24 (0.23)	34.4	0.39 (0.24)	35.7
Some college	0.55 (0.32)	40.1	0.66 (0.35)	40.6
College grad or higher	0.19 (0.39)	33.6	0.36 (0.38)	35.4
Equipment and help				
AT only			–0.00 (0.39)	
Spouse, child, parent help only			0.19 (0.41)	
Paid help only			–0.43 (0.54)	
Unpaid help only				
Multiple types of help			1.25 (0.48)*	
AT and any help			–0.33 (0.40)	
N	689		689	

Note: These models include only respondents who reported intrinsic disability and use of either help and/or AT. Models control for race, age · sex, sex · marital status, functional limitations, and whether respondents report difficulty with three or more ADLs.

*$p < 0.05$.

Table 6A.9 **Logistic regression models for ADL coping among females only, including covariates for use of equipment and help**

	ADL only: Women			
	Coefficient (SE)	Adjusted percent	Coefficient (SE)	Adjusted percent
Income				
$0–$9,999		34.9		35.4
$10K–$19,000	0.18 (0.18)	38.2	0.15 (0.19)	38.1
$20K–$29,999	0.20 (0.20)	38.6	0.15 (0.20)	38.1
$30K–$39,999	–0.13 (0.24)	32.5	–0.17 (0.24)	32.4
$40K–$49,999	–0.38 (0.35)	28.3	–0.34 (0.35)	29.4
$50K +	0.52 (0.35)	44.7	0.44 (0.36)	43.5
Education				
Less than high school		32.4		32.0
Some high school	0.22 (0.19)	36.5	0.27 (0.20)	36.9
High school graduate	0.48 (0.18)*	41.3	0.52 (0.18)*	41.4
Some college	0.39 (0.25)	39.6	0.44 (0.26)	39.9
College grad or higher	0.11 (0.30)	34.5	0.18 (0.31)	35.1
Equipment and help				
AT only			0.12 (0.30)	
Spouse, child, parent help only			–0.07 (0.35)	
Paid help only			–0.08 (0.35)	
Unpaid help only				
Multiple types of help			0.98 (0.36)*	
AT and any help			–0.07 (0.32)	
N	1,356		1,356	

Note: These models include only respondents who reported intrinsic disability and use of either help and/or AT. Models control for race, age · sex, sex · marital status, functional limitations, and whether respondents report difficulty with three or more ADLs.

*$p < 0.05$.

Table 6A.10 **Logistic regression models for IADL coping among males only, including covariates for use of equipment and help**

	IADL only: Men			
	Coefficient (SE)	Adjusted percent	Coefficient (SE)	Adjusted percent
Income				
$0–$9,999		20.4		19.5
$10K–$19,000	0.27 (0.20)	24.9	0.42 (0.22)	25.5
$20K–$29,999	0.62 (0.23)*	31.6	0.79 (0.25)*	31.6
$30K–$39,999	0.32 (0.30)	25.7	0.50 (0.34)	26.9
$40K–$49,999	0.30 (0.34)	25.4	0.45 (0.34)	25.9
$50K +	0.89 (0.27)*	37.1	1.13 (0.30)*	37.7
Education				
Less than high school		27.2		28.4
Some high school	–0.15 (0.21)	24.5	–0.24 (0.25)	24.7
High school graduate	–0.25 (0.19)	22.8	–0.37 (0.20)	22.7
Some college	0.11 (0.21)	29.2	0.08 (0.23)	29.8
College grad or higher	0.32 (0.25)	33.6	0.21 (0.25)	31.9
Help				
Spouse, child, parent help only			–0.45 (0.25)	
Paid help only			–0.29 (0.22)	
Unpaid help only				
Multiple types of help			1.50 (0.21)*	
N	1,510		1,510	

Note: These models include only respondents who reported intrinsic disability and use of either help and/or AT. Models control for race, age · sex, sex · marital status, functional limitations, and whether respondents report difficulty with three or more ADLs.

*$p < 0.05$.

Table 6A.11 **Logistic regression models for IADL coping for females only, including covariates for use of equipment and help**

	IADL only: Women			
	Coefficient (SE)	Adjusted percent	Coefficient (SE)	Adjusted percent
Income				
$0–$9,999		30.5		29.8
$10K–$19,000	–0.14 (0.12)	27.9	–0.06 (0.12)	28.8
$20K–$29,999	–0.01 (0.15)	30.2	0.02 (0.16)	30.1
$30K–$39,999	–0.13 (0.18)	28.0	–0.07 (0.19)	28.6
$40K–$49,999	–0.04 (0.19)	29.7	–0.00 (0.20)	29.8
$50K +	–0.07 (0.19)	29.2	–0.01 (0.20)	29.6
Education				
Less than high school		28.6		29.8
Some high school	0.10 (0.11)	30.4	0.05 (0.13)	30.7
High school graduate	0.00 (0.10)	28.6	–0.06 (0.11)	28.8
Some college	0.14 (0.15)	31.3	–0.05 (0.16)	28.9
College grad or higher	0.05 (0.16)	29.5	–0.10 (0.17)	28.1
Help				
Spouse, child, parent help only			–0.20 (0.15)	
Paid help only			–0.02 (0.15)	
Unpaid help only				
Multiple types of help			1.66 (0.14)*	
N	3,395			

Note: These models include only respondents who reported intrinsic disability and use of either help and/or AT. Models control for race, age · sex, sex · marital status, functional limitations, and whether respondents report difficulty with three or more ADLs.

*$p < 0.05$.

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Comment Michael D. Hurd

Introduction

A strong positive correlation between health and socioeconomic status (SES) is well established in the literature. Health can be measured by survival, self-rated health, disease conditions, ADL limitations, or other measures, and SES can be measured by income, wealth, education, and occupation, among others. Yet, a main finding of Cutler, Landrum, and Stewart is that education has a strong relationship with impairment and with coping with impairment, whereas income does not. For example, in figure 6.2, with the exception of the lowest income band, which has about 18 percent of the sample, there is little variation in the prevalence of an ADL limitation across income categories. Higher education helps to cope with ADL limitations, mainly through the use of equipment, but income does not (table 6.6). While these results may be correct, the data set on which they are based, the 1994 and 1995 National Health Interview Surveys (NHIS), has a deficient income measure, which will obscure the true relationship between income and other variables, including impairment. Furthermore, in estimations in which both income and education explain an impairment or coping with an impairment, the deficiencies in the measurement of income will affect estimated effects of education because of the positive correlation between income and education.

My discussion will focus on measurement error in income and how it will contaminate the estimated effects of education. Before that discussion, however, I note the low levels of ADL limitations reported in the NHIS: according to table 6.2, the rate was just 9.5 percent among those age sixty-five or over. The authors state that this rate is similar to the rate as measured in

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