

Age and Depression in the MIDUS Survey

Ronald C. Kessler, Kristin D. Mickelson, Ellen E. Walters,
Shanyang Zhao, and Lana Hamilton

How healthy are we? A national study of well-being at midlife. (2004) Brim, OG, Ryff, CD, & Kessler, RC (eds). Chicago, IL The University of Chicago Press, 227-251

Community surveys of psychiatric disorder have consistently found a negative relationship between age and lifetime clinical depression (Cross-National Collaborative Group 1992; Blazer et al. 1994; Kanowski 1994), with the highest rates usually found among young adults and the lowest rates usually found among the oldest old. However, the substantive plausibility of this finding has been called into question on the basis that cumulative lifetime risk cannot decrease with age. This means that there cannot be a negative relationship between age and lifetime disorder in the population in equilibrium (Robins et al. 1984).

Several methodological interpretations have been advanced to explain the observed negative relationship between age and depression. One is that recall error increases with age, leading to an apparent decrease in depression, even though true lifetime depression actually increases with age (Simon and Von Korff 1992). Simulation shows that a fairly modest increase in recall error with age could explain a negative relationship between age and lifetime depression of the size observed in most community surveys (Giuffra and Risch 1994). However, this hypothesis is inconsistent with the fact that the negative relationship between age and depression is found not only for lifetime depression but also for current depression.

A second methodological interpretation, this one accounting for the negative relationship between age and current depression, is that unwillingness to admit being depressed is positively associated with age. This hypothesis is consistent with evidence of a positive association between age and the perceived stigma of mental illness (Link and Cullen 1986). However, it is inconsistent with the fact that the negative relationship between age and current depression is between age and a diagnosis of major depressive episode, not age and depressed mood. That is, older people are not less likely to report feeling depressed. In fact, they report higher mean levels of depressed mood than do people in midlife (Jorm 1987; Kessler et al. 1992). Older people are, however, less likely than others to have the

cluster of associated signs and symptoms required to meet criteria for a psychiatric diagnosis of major depression. There is no reason to think that unwillingness to admit these associated signs and symptoms, such as loss of energy or problems with sleep, increases with age.

A related methodological possibility is that nonresponse errors as a result of confusion increase with age. This is especially likely among the oldest old but could occur with increasing age throughout the age range. However, even though an increase of this sort has been documented empirically (Colsher and Wallace 1989), the available evidence suggests that it is much too small to explain the age gradient of reported depression.

The fact that depressed mood increases with age beginning in midlife whereas major depression decreases with age means that the probability of depressed mood evolving into major depression decreases with age over the second half of the life cycle. This pattern could be the result of either methodological or substantive factors. The most plausible methodological interpretation is related to the fact that the structured diagnostic interviews used in community surveys to assess major depression are incapable of distinguishing between the somatic symptoms caused by depression and those caused by physical illness (Robins 1985). This lack of discriminating power is addressed in structured diagnostic interviews by using the conservative strategy of excluding somatic symptoms that might have been the result of organic causes in determining whether respondents meet criteria for major depression. Underreporting bias is introduced by this rule whenever respondents mistakenly interpret somatic symptoms as the result of physical illness when they are actually part of a depressive episode, an error that is thought to increase with age because older people are more likely than others to have a co-occurring physical illness. However, a recent study by Heithoff (1995) suggests that this bias is not large enough to explain the observed association between age and depression. This investigation reanalyzed data from a large community survey (Robins and Regier 1991) to determine the magnitude of the increase in late-life DSM-III (American Psychiatric Association 1980) major depression when the organic exclusion rules were relaxed and somatic symptoms were included in making diagnostic decisions, even if respondents reported that these symptoms were the result of physical illness or injury or medications. The prevalence of depression did not increase appreciably when this change was made, which argues against the importance of confusion about somatic symptoms as an explanation for the negative relationship between age and major depression.

A case could be made for a substantive interpretation of the finding that major depression decreases with age, even though depressed mood increases with age beginning in midlife. According to this interpretation, older people are better able to prevent depressed mood from evolving into major depression. Any number of processes could bring about such an effect. Perhaps the most plausible is that the increased life experience, maturity, or wisdom that comes with age (Baltes 1993; Gove, Ortega, and Style 1989; Staudinger, Smith, and Baltes 1992) leads to a decrease in the tendency to make cognitive distortions of the sort that are thought to underlie some episodes of major depression (Abramson, Metalsky, and Alloy 1989).

An alternate possibility is that selection is more important than individual change in explaining the apparent increase with age in the ability to prevent depressed mood from evolving into major depression in community samples. Rather than people becoming more wise or more in control of their emotions with age, according to this argument, persons who are prone to depression might be selected out of the community population with age because of high relative risks of early death or institutionalization (Murphy et al. 1987), leading to an ever more mentally healthy group of survivors. This hypothesis is consistent with evidence from prospective studies that depression is a significant risk factor for both physical morbidity (Stoudemire 1995) and early mortality (Bruce and Leaf 1989).

Whether due to individual change or to selection, the last two interpretations imply that there is a change with age in the predisposition to depression among persons in the community population. Although this hypothesized diathesis could be studied at a number of different levels, the most highly developed approach in survey research involves the stress reactivity paradigm. We know from this work that the majority of episodes of major depression are provoked by stressful life experiences (Brown and Harris 1978) and that a substantial part of individual difference in risk of major depression is the result of differential reactivity to stress (Kessler 1997). Within the context of this approach, the last two interpretations lead to the prediction that the impact of stressful experiences on major depression decreases with age and that this explains much of the negative relationship between age and depression. We evaluate this prediction in this chapter.

In addition, we consider the possibility that it is differential exposure to stress rather than differential stress-reactivity that explains the negative relationship between age and major depression, a possibility also

considered at the level of the daily stressor, by Almeida and Horn in chapter 15. Although it is true that stress in some domains increases with age (e.g., declining physical health, increasing exposure to death of loved ones), there are other domains in which the opposite is true. Both the roles and the role-related stresses associated with employment (Osipow, Doty, and Spokane 1985) and childrearing (Pasley and Gecas 1984) decrease for most people with age beginning at midlife. Financial adversity also decreases for many people with age, beginning in midlife, due to a combination of increased income and savings and decreased expenses. Furthermore, the accumulation of life skills with age helps many older people avoid exposure to some of the stresses that they would have been exposed to at earlier ages (Brandtstadter and Renner 1990). On the basis of these considerations, we evaluate the possibility that the negative relationship between age and major depression is the result of a decrease with age in exposure to depressogenic life experiences.

METHODS

The current report is based on data from the nationally representative subsample of 3032 MIDUS respondents who completed both the telephone and mail components of the basic survey. Weights are used to correct for discrepancies between the sample and the population on a series of U.S. Census variables.

The outcome of interest is past-year depressive episode defined according to the criteria in the third edition revised of the American Psychiatric Association's (APA) *Diagnostic and Statistical Manual of Mental Disorders* (DSM-III-R; APA 1987). The diagnosis requires that a person experience a period of at least two weeks of either depressed mood or anhedonia most of the day, nearly every day, and a series of at least four other associated symptoms typically found to accompany depression, including problems with eating, sleeping, energy, concentration, feelings of self-worth, and suicidal thoughts or actions. The diagnosis was operationalized in a screening version of the major depression section of the World Health Organization's (WHO) Composite International Diagnostic Interview (CIDI; WHO 1990, 1997). WHO field trials (Wittchen 1994) and other methodological studies (Blazer et al. 1994) have documented good test-retest reliability and clinical validity of the CIDI diagnosis of DSM-III-R major depression.

We consider the relationship of major depression both with *roles* that may change over the life course (marital status, employment status, parenting status) and with respondent evaluations of *stresses* in each of

six major life areas (physical health, work situation, finances, relationship with children, marriage or close relationship, and sexuality).

The measure of marital status distinguishes the married from the never married, separated/divorced, and widowed. Respondents who reported that they were cohabiting were coded as married even if they reported being never married, separated/divorced, or widowed.

The measure of employment status distinguishes the employed from homemakers, the retired, and those in all other employment categories. MIDUS respondents were allowed to endorse more than one employment category (e.g., they could report that they were employed homemakers or disabled students or retired people who were currently working, and so forth). However, we coded employment status so that a single master status was assigned to each respondent. First, those who reported that they were currently working were coded as employed. Those who defined themselves as unemployed or other (e.g., temporarily laid off, on maternity or sick leave, permanently disabled, part-time students) were coded as unemployed, whether or not they also described themselves as homemakers or retired. Those who defined themselves as retired were coded as retired, whether or not they also described themselves as homemakers. Those who defined themselves only as homemakers were coded as homemakers. The twenty-seven full-time students in the sample who endorsed no other employment category were excluded from all analyses because they were so few in number.

The measure of parenting status is a simple dichotomy that distinguishes respondents who have one or more living children from those with no living children. A more refined classification scheme was originally explored that included information about number of children in each of three age ranges (0–12, 13–19, 20+). However, no evidence was found that variation in number or age of children, or the cross-classification of number by ages of children, increased our ability to predict major depression among either women or men or that these more refined variables interacted with age in predicting major depression among either women or men.

The stress measures are based on respondent ratings on a worst-to-best self-anchoring scale. Respondents were asked to think about each of the six areas of life assessed in these measures and to rate their situation in that area on a 0–10 scale, where 0 means “the worst possible situation” in that area and 10 means “the best possible situation.” Although these rating scales do not directly assess stress in each domain, researchers have shown that satisfaction with various life domains is strongly related

to stress (Baruffol, Gisle, and Corten 1995; Hall, Matthews, and Keeler 1984), suggesting that dissatisfaction with one's current situation in life may be an indicator of stress in that particular domain.

The physical health question simply asked for a rating of "your health." The work situation question asked respondents to "think of the work situation you are in now, whether part-time or full-time, paid or unpaid, at home or at a job" and to rate their "work situation" on the 0–10 worst-to-best scale. The finances question asked for a rating of "your financial situation." The sexuality question asked for a rating of "the sexual aspect of your life." The questions about marriage/close relationships and children were only asked of a subsample rather than the entire sample of respondents. The marriage/close relationship question (hereafter referred to as the marriage question) asked people who were married or living with a partner how they would rate their marriage or close relationship, whereas the children question asked parents to rate their "overall relationship with" their children.

Analysis Procedures

The analysis began by excluding the respondents who were full-time students with no other employment status, leaving 2993 (1310 men and 1683 women) for analysis. We then examined the bivariate relationship between age and major depression. This relationship was found to be significant and negative for both men and women. Age variation in the distribution and impact of roles and stresses on major depression was examined next. Finally, we used demographic rate standardization (Iams and Thornton 1975) to compare the relative contributions of differential exposure and differential reactivity to roles and stresses in explaining the observed age differences in major depression.

The models reported throughout the chapter were estimated with ordinary least squares (OLS) regression using weighted data. As noted later in the chapter, logistic regression could have been used instead of OLS. As it happened, all results were replicated with logistic regressions, and the substantive conclusions reported here remained unchanged. Presentation of results in terms of OLS was chosen because it created advantages in interpreting the results involving demographic rate standardization. Significance tests were adjusted for the use of weights by assuming a design effect of 1.2 for all univariate and multivariate analyses. This assumption is based on preliminary investigation of design effects on total sample means across a wide range of variables in the MIDUS data. Because design effects are generally smaller for multivariate than univariate statistics

TABLE 1 Relationship between Age and Twelve-Month DSM-III-R Major Depressive Episode, by Sex

Age	Men ^a			Women ^b		
	%	SE	<i>n</i>	%	SE	<i>n</i>
25-34	12.1	(2.1)	(317)	20.7	(2.5)	(452)
35-44	11.2	(1.8)	(400)	22.6	(2.4)	(439)
45-54	11.1	(1.9)	(273)	16.0	(2.1)	(303)
55-64	7.4	(1.8)	(165)	9.8	(1.8)	(292)
65-74	3.3	(1.5)	(155)	10.4	(2.5)	(197)
Total	10.0	(0.9)	(1310)	17.3	(1.1)	(1683)

^a $\chi^2_{(4)} = 9.7, p < .05.$

^b $\chi^2_{(4)} = 25.7, p < .001.$

and are smaller in subsamples than total samples, the simplifying assumption of a constant design effect based on total sample univariate analyses is likely to be conservative (Kish 1965).

RESULTS

The Bivariate Relationship between Age and Major Depression

Table 1 shows prevalence estimates of twelve-month DSM-III-R major depression as estimated from the screening version of the CIDI. The sample-wide prevalence estimate of 14.1 percent is higher than the estimates in surveys that use the full CIDI rather than a screening version to assess depression (e.g., Blazer et al. 1994). This reflects the fact that the full CIDI has exclusion criteria that result in a lower prevalence estimate. Despite this difference, we find, consistent with previous research (Kessler et al. 1993, 1994), that women have a significantly higher estimated twelve-month prevalence of depression than do men ($\chi^2(1) = 26.8, p < .001$) and that there is a significant negative relationship between age and depression among both men ($\chi^2(4) = 9.7, p < .05$) and women ($\chi^2(4) = 25.7, p < .001$).

The Effects of Roles on Depression

Previous research has shown that social roles are strongly related to depressed mood (Lennon and Rosenfield 1992; McLanahan and Adams 1987; Mirowsky and Ross 1986). Married people in most community surveys have lower mean scores on continuous measures of depressed mood than do the unmarried, whereas employed people have lower mean scores than homemakers and the unemployed. These relationships are generally stronger among men than women. Research on the effects of

having children is varied. Although most studies show that people with dependent children have higher mean levels of depressed mood than do others, other studies show that this association is stronger for women than men, and still others have found that the effect of children becomes weaker for women but stronger for men as the children grow older. It is not clear whether these associations are entirely the result of the effects of roles on depression. Selection processes could also be at work. Consistent with this possibility, we know that depression is a significant predictor of early childbearing (Kessler et al. 1997), marital timing and stability (Kessler and Forthofer 1999), and employment status (Ettner, Frank, and Kessler 1997).

Less is known about the relationships of social roles with major depression. In an effort to study this in the MIDUS data, we estimated a series of recursive regression equations in which information about social roles was used to predict twelve-month major depression. We also investigated whether the effects of social roles on depression vary with age. We recognize that the implicit assumption in these analyses, that roles influence depression but depression does not influence roles, is simplistic. However, we have no realistic way of identifying a more complex specification with the MIDUS data.

We began with bivariate analyses of the effects of marital status, employment status, and parenting status on depression. As described earlier in the section on measures, the analysis of parenting led to the decision to make only a simple dichotomous distinction between those who had one or more living children and those who had none. The analysis of marital status distinguished the married/cohabiting from noncohabiting persons who were never married, separated/divorced, or widowed. The analysis of employment status distinguished the employed from homemakers, retired persons, and other unemployed individuals. More detailed distinctions were not significant either in predicting depression or in documenting interactions with age in predicting depression.

The next step in the analysis was to examine the age gradient in these roles. Results are shown in table 2 (below, pp. 236–37). We see that there are significant age differences in all the roles. The percentage of men who are married increases with age. Among women, the percentage who are married increases with age up through the midfifties and then decreases. There is a similar increase and then decrease after age 54 for the percentage of both men and women who are separated/divorced. The percentage of those who never married, in comparison, decreases consistently with

age, while the percentage of the widowed increases with age. The last of these trends is much more pronounced among women, both because men tend to die earlier than women and because widowed men are much more likely to remarry than widowed women.

The percentage of men who are employed is 95 percent in the youngest age group and declines over the age range. Among women, in comparison, the percentage employed in the youngest age group is much lower (74 percent), and it increases through the women's midforties before declining. This sex difference is consistent with what we know about delays in female labor force participation as a result of childbearing and childrearing. The percentage of women who describe themselves as a homemaker is higher in the youngest age group than in any other age group over the next three decades; the percentage then rises again in the oldest age group. Predictably, the percentage of retired persons increases steadily with age among both men and women, while the percentage in other unemployed statuses decreases in the older groups. The percentage of respondents who have ever had a child, finally, is lowest in the youngest age group and is fairly consistent across the other four age groups in the sample.

The next step was to use linear regression to estimate the additive and joint effects of age, employment status, marital status, and parental status on past-year depression. Linear regression was used instead of logistic regression in order to avoid the suppression of linear interactions that occurs in logistic models. Regression diagnostics showed that the problem of predicted values lying outside the range of the outcome, which can occur when a linear model is used to predict a skewed dichotomous outcome, did not occur with these data.

The regression analysis began with a series of global tests to evaluate the significance of interactions. Although some significant three-way and two-way interaction terms among the three role measures were found, they did not significantly increase the variance over the main effects model, and the number of significant interaction terms was not more than one would expect to find based on chance. On the basis of these results, our final model included only additive effects of roles and age.

The parameter estimates of the additive model are shown in table 3 (see p. 238). The first set of coefficients in the table is for marital status. The omitted category is married. Controlling for age and the other roles in the model, the separated/divorced have a significantly higher prevalence of twelve-month depression than do the married among both men and women. There is no significant difference between the never married

TABLE 2 Relationships between Age

		25-34		35-44	
		%	SE	%	SE
Men					
Marital status	$\chi^2_{(12)} = 167.8, p < .001$				
Married/cohabiting		60.3	(3.1)	77.3	(2.4)
Separated/divorced		7.9	(1.8)	15.2	(2.1)
Widowed		0.0	(—)	0.5	(0.4)
Never married		31.7	(3.0)	7.0	(1.4)
Employment status	$\chi^2_{(8)} = 593.3, p < .001$				
Working		94.8	(1.4)	91.3	(1.6)
Retired		0.5	(0.4)	0.4	(0.3)
Other unemployed		4.7	(1.3)	8.3	(1.5)
Parenting status	$\chi^2_{(4)} = 137.0, p < .001$				
Children		54.5	(3.2)	84.1	(2.1)
No children		45.5	(3.2)	15.9	(2.1)
Women					
Marital status	$\chi^2_{(12)} = 338.3, p < .001$				
Married/cohabiting		60.9	(3.1)	65.4	(2.7)
Separated/divorced		14.4	(2.2)	24.4	(2.5)
Widowed		0.2	(0.3)	1.0	(0.5)
Never married		24.5	(2.6)	9.2	(1.6)
Employment status	$\chi^2_{(12)} = 540.3, p < .001$				
Working		73.7	(2.7)	81.1	(2.3)
Homemaker		17.0	(2.3)	10.7	(1.8)
Retired		0.0	(—)	0.0	(—)
Other unemployed		9.3	(1.9)	8.3	(1.6)
Parenting status	$\chi^2_{(4)} = 92.2, p < .001$				
Children		71.3	(2.8)	89.9	(1.8)
No children		28.7	(2.8)	10.1	(1.8)

Notes: Employment status was classified hierarchically. For those with multiple responses, the order of category assignment was “working,” “other unemployed,” “retired,” and “homemaker.” Due to small sample size, men who reported “homemaker” were reclassified as “other unemployed.”

and the married. Widowed men have a significant elevated rate of depression, but this is not true among women. These results are consistent with previous studies in finding that risk of depression is elevated by marital separation and divorce (Aseltine and Kessler 1993) and that the depressogenic effect of widowhood is significantly greater among men than women (Umberson, Wortman, and Kessler 1992).

The next set of coefficients in the table is for employment status. The omitted category is employed. Homemakers, among women, and persons in the other unemployed category, among both men and women,

and Social Roles, by Sex

Age					
45–54		55–64		65–74	
%	SE	%	SE	%	SE
76.5	(2.4)	80.4	(2.6)	82.6	(3.3)
17.5	(2.2)	11.7	(2.2)	6.1	(2.1)
0.6	(0.4)	4.6	(1.4)	5.6	(2.0)
5.4	(1.3)	3.4	(1.2)	5.7	(2.0)
92.1	(1.5)	64.3	(3.2)	22.0	(3.6)
1.9	(0.8)	31.6	(3.2)	77.1	(3.6)
6.0	(1.4)	4.1	(1.3)	1.0	(0.9)
89.9	(1.8)	89.1	(2.1)	90.0	(2.6)
10.1	(1.8)	10.9	(2.1)	10.0	(2.6)
68.6	(2.6)	66.3	(2.8)	57.6	(4.2)
24.6	(2.5)	15.5	(2.2)	9.3	(2.4)
2.8	(1.0)	12.7	(2.0)	32.0	(3.9)
3.9	(1.1)	5.5	(1.4)	1.2	(0.9)
72.4	(2.6)	54.9	(3.0)	19.5	(3.3)
14.3	(2.0)	14.6	(2.1)	21.9	(3.5)
3.1	(1.0)	24.3	(2.6)	57.7	(4.2)
10.3	(1.8)	6.2	(1.4)	0.9	(0.8)
92.7	(1.5)	90.7	(1.8)	93.0	(2.2)
7.3	(1.5)	9.3	(1.8)	7.1	(2.2)

have significantly higher prevalences of depression than do the employed. There is no significant difference in depression between the retired and the employed. These results are consistent with previous research documenting adverse effects of unemployment (Kessler, Turner, and House 1989), elevated rates of depression among homemakers (Blazer et al. 1994; Rosenfield 1989), and no significant adverse aggregate effect of retirement on depression (Midanik et al. 1995).

The final coefficient in the table compares respondents who have a child with those who do not. There is no significant difference in the prevalence of depression between these two groups, either among men or women. As noted earlier, previous research has yielded inconsistent results about this relationship, so it is not surprising that the pattern here is

TABLE 3 Linear Regressions of Twelve-Month DSM-III-R Major Depressive Episode on Social Roles and Age, by Sex

	Men		Women	
	b	SE	b	SE
Marital status				
Married/cohabiting	0.00	(—)	0.00	(—)
Separated/divorced	0.10***	(.02)	0.11***	(.03)
Widow	0.14*	(.07)	0.05	(.04)
Never married	0.03	(.03)	0.00	(.04)
Employment status				
Working	0.00	(—)	0.00	(—)
Homemaker	—	(—)	0.08**	(.03)
Retired	0.02	(.03)	0.03	(.04)
Other unemployed	0.17***	(.03)	0.08*	(.04)
Parenting status				
Children	0.00	(—)	0.00	(—)
No children	−0.01	(.02)	0.05	(.03)
Age				
25–34	0.10**	(.04)	0.12**	(.04)
35–44	0.08*	(.04)	0.14***	(.04)
45–54	0.08*	(.04)	0.07	(.04)
55–64	0.04	(.03)	0.01	(.04)
65–74	—	(—)	—	(—)
	$R^2 = .04$		$R^2 = .04$	
	$F_{(10,1449)} = 5.5,$		$F_{(11,1522)} = 4.3,$	
	$p < .001$		$p < .001$	

* $p < .05$. ** $p < .01$. *** $p < .001$.

not significant. It is consistent with previous research that the regression coefficient for women is stronger than for men. It is somewhat surprising, on the other hand, that we failed to find significant specifications depending on the number and ages of children or, among women, in comparing homemakers with the employed, because these specifications have generally been found in previous research on depressed mood (Bromberger and Matthews 1994; Brown and Bifulco 1990; Hock and DeMeis 1990).

The Effects of Stress on Depression

Previous research has shown that stressful life experiences are powerful predictors of major depression (Kessler 1997). In an effort to study this relationship in the MIDUS data, we estimated a series of recursive equations in which the 0–10 rating scales of stress in six major life

domains were used to predict twelve-month depression and to investigate whether the effects of stress on depression vary with age.

We began by performing preliminary analyses of the functional form of the relationships between each of the rating scales and depression. In every case we found a significant relationship that could be adequately described by a dichotomy that distinguished respondents who reported problems in that area of life from those who did not. Thus, individuals with a score of 0 to 5 on physical health, work situation, marriage, and sexuality, or a score of 0 to 4 on children, or 0 to 3 on finances were coded as having a stress in that particular area of life.

We then examined the age gradient in exposure to these dichotomously coded stresses. As shown below in table 4, three broad patterns can be observed in this gradient. The most common is an increase in stress from early adulthood to midlife and then a decrease from midlife to older age. This pattern is found for nearly half the entries in the table, including stresses in the areas of physical health, marriage, and children among men and physical health, work situation, and children among women. The second most common pattern is a steady decrease in stress across the full age range. This is found for work situation and finances among men and for finances and marriage among women. The third pattern is a steady increase in stress throughout the age range, which is found for sexuality among both men and women.

We next estimated a series of interaction models to determine whether the effects of these dichotomously measured stresses on past-year depression vary significantly across the age range of the sample. A number of significant interactions were found. Final models were then estimated in which the slopes of the stresses were constrained to be equal across the age groups where significant differences had not been found and allowed to vary across those where significant differences had been found. Only an additive specification was considered.

Table 5 (on pp. 242–43) shows the results of a model that includes the effects of the significant stress measures controlling for roles. Among men, significant effects were found for stresses in the domains of physical health, work situation, and finances. The strongest effect is for physical health and the weakest is for work situation. All effects other than that of physical health are constant across the age range of the sample, whereas the physical health effect is significantly stronger in midlife than in the youngest and older age groups. Among women, significant effects were found for stresses in all six domains of physical health, work situation,

TABLE 4 Relationships between Age and

Life Stresses	25-34		35-44	
	%	SE	%	SE
Men				
Physical health	8.5	(1.8)	12.7	(1.9)
Work situation	21.1	(2.6)	19.7	(2.3)
Finances	18.6	(2.4)	15.8	(2.1)
Children	0.4	(0.4)	3.8	(1.1)
Marriage	5.5	(1.4)	10.0	(1.8)
Sexuality	31.4	(3.0)	30.0	(2.6)
Women				
Physical health	15.1	(2.2)	16.1	(2.1)
Work situation	21.3	(2.5)	21.2	(2.4)
Finances	22.8	(2.6)	17.3	(2.2)
Children	1.4	(0.8)	2.3	(0.9)
Marriage	16.3	(2.3)	14.1	(2.0)
Sexuality	34.2	(3.0)	38.3	(2.8)

Note: Life stresses were entered as dichotomous variables; cutoff points were determined on the basis of prior analyses.

* $p < .05$. ** $p < .01$. *** $p < .001$.

finances, sexuality, marriage, and children. The strongest consistent effect is for children and the weakest for sexuality. Unlike the situation with men, the effects of stresses in physical health, work situation, finances, and marriage become smaller for women with increasing age.

The Effects of Stress on the Relationship between Age and Depression

It is possible to quantify the joint effects of changes in roles, in stress exposure, and in stress reactivity on the relationship between age and depression by the use of demographic rate standardization (Iams and Thornton 1975). This method manipulates the slopes and means of the predictor variables in pairs of regression equations to calculate how difference in average rates of the outcomes in two subsamples would change if the means and/or slopes of the predictors were constant across the subsamples. By doing this in a systematic way for each logically possible combination of mean and slope differences, it is possible to partition the observed mean difference in the outcome into components due to age differences in roles, in exposure to stress, in the impact of stress on depression, and into a residual that is not explained by the predictor variables.

There are ten logically possible pairwise comparisons among the five age groups considered here. However, we focus on only the subset of these

Satisfaction in Seven Life Domains, by Sex

Age		45–54		55–64		65–74		F
%	SE	%	SE	%	SE	%	SE	
11.7	(1.9)	20.1	(2.7)	13.2	(3.0)	3.4**		
19.3	(2.3)	18.7	(2.6)	14.7	(3.1)	0.7		
8.4	(1.6)	7.2	(1.8)	5.1	(1.9)	7.3***		
2.4	(0.9)	2.7	(1.1)	0.9	(0.8)	2.5*		
7.0	(1.4)	3.2	(1.3)	1.6	(1.1)	4.3**		
34.5	(2.7)	42.6	(3.3)	54.9	(4.3)	8.7***		
22.3	(2.4)	15.2	(2.2)	14.9	(3.0)	1.7		
23.3	(2.4)	20.9	(2.4)	12.9	(2.8)	1.7		
14.4	(2.0)	13.6	(2.1)	10.8	(2.6)	3.8**		
3.1	(1.0)	0.5	(0.4)	0.9	(0.8)	1.5		
8.1	(1.5)	8.0	(1.6)	4.6	(1.8)	5.7***		
44.3	(2.8)	54.8	(3.0)	60.3	(4.2)	11.4***		

ten that involves significant differences in rates of depression. There are seven of these among men and eight among women. The rationale for selecting these subsets can be seen by returning briefly to table 1. We see there that among men, the prevalence of depression is not significantly different in the three youngest age groups, but it decreases significantly in the fourth group and decreases again significantly in the oldest age group. As a result, we are interested in the pairwise comparisons among men in each of the first three groups with the fourth and in each of the first four groups with the fifth. Among women, in comparison, the prevalence of depression is not significantly different in the two youngest age groups, but it decreases significantly in the third group and again in the fourth group. The fourth and fifth groups do not differ significantly. As a result, we are interested in the pairwise comparisons among women in each of the first two groups with the third and in each of the first three groups with the fourth and fifth.

The decompositions of these significant differences are reported in table 6. We begin by considering men. The results of the seven decompositions are similar in that the smallest two components, in most cases, are the results of differences in roles or differences in stress exposure, and (in four of the seven comparisons) the largest to stress reactivity. All of these effects combined explain between 3 percent and 94 percent of the observed pairwise mean differences in depression.

TABLE 5 Multiple Linear Regression of Twelve-Month

	25–34		35–44	
	b	SE	b	SE
Men^a				
Physical health	.02	(.07)	.18***	(.03)
Work situation	.04*	(.02)	.04*	(.02)
Finances	.07**	(.03)	.07**	(.03)
Women^b				
Physical health	.24***	(.05)	.08**	(.03)
Work situation	.13**	(.05)	.02	(.03)
Finances	.13**	(.05)	.09**	(.03)
Sexuality	.05*	(.02)	.05*	(.02)
Marriage/relationship	.08*	(.04)	.08*	(.04)
Children	.26***	(.08)	.26***	(.08)

^aThe five subgroup regression equations for men were estimated in a single model that assessed all respondents. The model included four intercepts for the five age cohorts, two dummy variables that were constant across age for the effects of stresses in the domains of work situation and finances, and separate dummy variables for stress in the domain of physical health for those in the age ranges of 25–34, 35–54, and 55–74. We also controlled for social roles. The overall model is significant ($F_{(15,1444)} = 6.59$, $p < .001$; $R^2 = .08$), and each of the predictors is significant at the .05 level, two-tailed test, in at least one subgroup.

^bAs with men, the five subgroup regression equations for women were estimated in a single model that assessed all respondents. The model included four intercepts for the five age cohorts, two dummy variables that were constant across age for the effects of stresses in the domains of sexuality and children, and separate dummy variables for stresses in the domains of physical health, work situation, finances, and marriage. We also controlled for social roles. The overall model is significant ($F_{(21,1512)} = 7.64$, $p < .001$; $R^2 = .11$), and each of the predictors is significant at the .05 level, two-tailed test, in at least one subgroup.

* $p < .05$. ** $p < .01$. *** $p < .001$.

The consistently small component due to role differences is the result of counteracting differences in roles over the age range of the sample. As shown in table 2, older men are advantaged in having lower rates of separation/divorce and of other unemployment than younger men, but they are disadvantaged in having a higher rate of widowhood. These opposite effects cancel each other out to produce the small role exposure components shown in the table, with the sign varying from one pair to the next, depending on whether the advantages are larger or smaller than the disadvantages in any particular comparison.

The somewhat larger component due to differences in stress exposure is the result of a similar balancing of opposites. As shown in table 4, older men are advantaged in having lower rates of stress in the domains of work and finances than are younger men, but they are disadvantaged in having

DSM-III-R Major Depressive Episode on Stress, by Sex

Age		45-54		55-64		65-74	
	b	SE	b	SE	b	SE	
	.18***	(.03)	-.04	(.04)	-.04	(.04)	
	.04*	(.02)	.04*	(.02)	.04*	(.02)	
	.07**	(.03)	.07**	(.03)	.07**	(.03)	
	.08**	(.03)	.08**	(.03)	.08**	(.03)	
	.02	(.03)	.02	(.03)	.02	(.03)	
	.09**	(.03)	.09**	(.03)	.09**	(.03)	
	.05*	(.02)	.05*	(.02)	.05*	(.02)	
	.00	(.05)	.00	(.05)	.00	(.05)	
	.26***	(.08)	.26***	(.08)	.26***	(.08)	

higher rates of stress in the domains of physical health and sexuality. The balance favors younger men up through the midsixties but older men thereafter.

The consistently positive component due to stress reactivity, finally, is the result of the lower impact of physical health problems on older rather than middle-aged men. This difference alone explains on average 71 percent of the age difference in depression in the comparisons of men in the three youngest age groups with those in the age group 55-64, and between 8 percent and 36 percent of the differences of men younger than 55 with those aged 65-74. Differential stress reactivity plays no part in the comparison between men in the two oldest age groups, though, because low stress reactivity characterizes men in both these groups.

The results are somewhat different among women. As with men, older women are advantaged by having lower rates of separation/divorce and lower rates of membership in the other unemployed category than younger women have, but they are disadvantaged by having a much higher rate of widowhood and a higher rate of being homemakers than middle-aged women have. Unlike men, though, these opposite effects cancel each other out in a way that produces a consistent disadvantage for older women. The main sex difference here involves the fact that many women, but virtually no men, are homemakers. As shown in table 2, the proportion of women who are homemakers generally increases with age.

TABLE 6 Decompositions of Age Differences in Twelve-Month DSM-III-R Major Depressive Episodes (percentage)

	Age Groups Compared ^a		Reasons for Depression			
			Roles	Stress	Stress	Residual
				Exposure	Reactivity	
Younger	Older					
Men						
25-34	55-64	-21.3	21.6	19.6	79.9	
35-44	55-64	-5.3	2.5	96.6	6.3	
45-54	55-64	-1.4	-14.0	95.8	19.7	
25-34	65-74	-9.6	14.1	7.8	87.7	
35-44	65-74	-1.1	11.9	35.8	53.5	
45-54	65-74	0.9	4.3	34.7	60.5	
55-64	65-74	2.7	0.5	0.0	96.6	
Women						
25-34	45-54	-0.2	-19.5	144.9	-25.4	
35-44	45-54	-5.5	-7.8	14.1	99.5	
25-34	55-64	-4.4	6.1	57.0	41.5	
35-44	55-64	-6.5	3.0	7.3	96.3	
45-54	55-64	-7.5	14.7	0.0	92.8	
25-34	65-74	-21.9	13.5	53.9	54.6	
35-44	65-74	-21.6	5.2	6.4	110.0	
45-54	65-74	-40.6	18.3	0.0	122.4	

^aComparisons are limited to pairs in which the older group has a significantly lower prevalence of depression than the younger group at the .05 level (one-tailed test).

As shown in table 3, being a homemaker is associated with increased risk of depression throughout the age range of the sample.

There is a consistently positive component, in comparison, that results from differences in stress exposure. Again, this is due to counteracting forces. As shown in table 4, older women are advantaged in having lower rates of stress in the domains of work, finances, children, marriage, and, surprisingly, physical health. They are disadvantaged in only one area, sexuality. In almost all the pairwise comparisons, the advantages outweigh this one disadvantage. However, differences due to stress exposure do not account for a large part of the mean difference in depression in any of the age comparisons.

The consistently positive stress reactivity component, finally, is the result of lower impacts of a number of stresses on older as opposed to younger women. As shown in table 5, these include lower effects of stresses in the domains of physical health and work situation. The stress reactivity component in table 6 is the largest substantive component in five of the eight pairwise comparisons among women, explaining between 7 percent

and 145 percent of the observed mean difference in depression between age groups.

DISCUSSION

The MIDUS survey has a lower response rate than do some other surveys that have examined the relationship between age and depression. This is potentially an important issue for the investigation of this particular association because depression might be related to age differences in response bias. An additional potential problem is that MIDUS used a CIDI screening measure of major depression rather than the full CIDI. Despite these two potential limitations, though, we still found the same negative relationship between age and twelve-month DSM-III-R major depression in the MIDUS data that has been documented in other surveys having higher response rates and using the full CIDI (e.g., Robins and Regier 1991; Blazer et al. 1994).

Our analysis suggests that differences in roles over the age range of the sample do not play an important part in the age–depression relationship among men. However, these differences appear to dampen the age gradient among women as a result of increases in depression associated with higher proportions of older women who are widowed and homemakers, more than offsetting the decreases in depression associated with lower proportions of older women who are separated/divorced or unemployed. Our results suggest that were it not for these differences in roles, the negative relationship between age and depression would be even stronger than it is.

It is important to recognize that this conclusion is based on the naive assumption that the relationship between roles and depression is recursive, that role-related experiences influence risk of depression but that depression does not influence the selection of roles. Although this assumption is routinely made in studies of sex roles and mental illness (e.g., Gore and Mangione 1983; Mirowsky and Ross 1986), there is good reason to believe that it is incorrect. Indeed, recent epidemiological surveys have shown that a variety of psychiatric disorders, depression included, influence such important role transitions as high school graduation, college entry, and college dropout (Kessler et al. 1995), marital timing and marital stability (Kessler and Forthofer 1999), teenage child-bearing (Kessler et al. 1997), and employment status (Ettner, Frank, and Kessler 1997). As a result of these considerations, it is not appropriate to interpret the slopes in table 3 as representing *effects* of roles on depression. There is presumably some part of these associations that is due to

differences in the stresses, vulnerabilities, and resources to which people are exposed as a function of their social roles, but we have no way of separating these components from the components that are the result of selection.

We also found that there are important age-related differences in exposure to stress. Contrary to the naive view that aging is invariably associated with increases in a variety of stresses, we find that this is not the entire story. There are increases in role loss with age because of widowhood and retirement and increases in the stresses associated with sexuality. However, there are more areas of life in which stresses decrease with age, including stresses in the areas of job, finances, and personal relationships. On balance, these changes are to the advantage of older people. This is especially true among women.

It is important to appreciate, in interpreting this last result, that the measures of stress used here were based on rating scales of how things are going in various areas of life. Although the questions implied that respondents were supposed to make objective assessments rather than report emotional reactions, it is clear that standards for assigning oneself a score on a 0–10 scale from “the worst possible situation” in that area to “the best possible situation” depend critically on standards for what is possible. The latter almost certainly change over time and probably account for at least some part of the observed differences in the age gradient of reported stresses. This is the most plausible interpretation, for example, of the finding that there is a significant drop between the next to oldest and oldest age groups in the percentage of men who rated their physical health in the range we defined as indicating stress. It is unlikely that these older men are actually in better physical health. Their responses more likely reflect lowering of expectations of what is possible at their age.

If this is true, we may need a more active view of the processes involved in the decrease in stress exposure with age seen in the MIDUS data, to see people as modifying their expectations as they age in order to reduce the extent to which objective increases in stress provoke depression. Research by Brandtstadter and Renner (1990) documents that changes of this sort do, in fact, occur with age. These authors find that people increasingly adopt an accommodative mode of coping with stress as they age in which preferences and expectations are adjusted in light of increasing situational constraints. Brim (1992) advanced a similar argument in his discussion of strategies used to redefine goals with increasing age in an effort to

maintain a just manageable level of difficulty that promotes continued engagement and feelings of mastery in light of the fact of objectively declining capacities.

Similar processes could be at work to explain the finding that stress reactivity decreases with age. One way in which this could occur is by people reducing their emotional investment in areas of life where they are having difficulties, a process that appears to be more common with increasing age (Brandtstadter and Rothermund 1994). Other processes are also likely at work. One set might involve greater access to objective coping resources that increase with age, such as financial assets and social networks, which have been found to buffer the impact of stress on depression (Brown and Harris 1978). Another set might involve intrapsychic resources that increase with age, such as the use of more effective coping strategies to manage stress and the ability to focus coping energies increasingly on problems that one can control (Blanchard-Fields and Irion 1988).

The MIDUS data can be used to evaluate most of these possibilities because the survey included information about a wide range of objective and intrapsychic resources and vulnerabilities. In exploring their effects on reactivity, we will have to make sense of the fact that the evidence for age-related changes is much more consistent for women than for men. We must also explain the fact that the critical age range in which decreased reactivity begins varies across the domains of stress considered here. These specifications mean that no one global resource could explain all of the age-related changes in reactivity that emerge in the data. A series of accumulating resources with stress-buffering effects that involve some sort of threshold are more likely to be involved.

An important issue that cannot be assessed in more detailed analysis of the MIDUS data concerns change versus selection. Even if we can pinpoint resources that appear to account for the decreasing depressogenic effects of stress with age among women, we will probably be unable to determine how much of their increase with age in our community sample is the result of resource accumulation in the lives of individuals over time and how much is the result of the fact that people who lack these resources are at increased risk of early death and institutionalization. The only feasible way of sorting out these possibilities is by following people through time. We are in the fortunate position of having a wide-enough age range in the MIDUS sample that this is possible. Our work with the data over the next few years will tell us whether enough provocative, targeted hypotheses of

significance (either for theory or social policy) emerge from the data to warrant follow-up of the sample. If so, we will be in a position to sort out the relative contributions of resource accumulation and selection.

ACKNOWLEDGMENTS

The authors thank Carol Ryff, Paul Griffin, Ken Texiera, Andrew Shippy, Douglas Katz, Paula Calabrese, Debbie Heiser, Kathy Jankowski, Rosie Sood, and Tonly Tonona for helpful comments on the manuscript. Support for this work was provided by National Institute of Mental Health grants K05-MH00507 and T32 MH16806.

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