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The Social Structuring of Mental Health over the Adult Life Course: Advancing Theory in the Sociology of Aging

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Abstract

The sociology of aging draws on a broad array of theoretical perspectives from several disciplines, but rarely has it developed its own. We build on past work to advance and empirically test a model of mental health framed in terms of structural theorizing and situated within the life course perspective. Whereas most prior research has been based on cross-sectional data, we utilize four waves of data from a nationally representative sample of American adults (Americans' Changing Lives Study) collected prospectively over a 15-year period and find that education, employment and marital status, as well as their consequences for income and health, effectively explain the increase in depressive symptoms after age 65. We also found significant cohort differences in age trajectories of mental health that were partly explained by historical increases in education. We demonstrate that a purely structural theory can take us far in explaining later life mental health.

Frame works to Classify Theory

Discussions of theory in the sociology of aging have tended to contrast the merit of different theoretical approaches (Bengtson, Burgess and Parrott 1997; Marshall and Clarke 2007; Hendricks 1992). Marshall (1996) put forth a typology that distinguishes two major axes of social theory: the micro-macro dimension and the normative-interpretive dimension. The *micro-macro* dimension describes whether the theoretical approach focuses on micro-level social psychological processes at the level of the individual in social interaction, or on macro-level social institutions, such as the economy or the family, or even the social class system or the welfare state. The *normative-interpretive* dimension classifies approaches on a range from those that give little attention to human autonomy and meaning-construction (e.g., structural theories from functionalism through some forms of Marxism), to those that view the individual as a voluntaristic actor who attempts to exercise choice (e.g., Weberian sociology, symbolic interactionism, phenomenology).

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Theoretical perspectives, and the rare theories in the field of aging, can be classified along these two dimensions. For example, disengagement theory (Cumming and Henry 1961) and its counterpart, activity theory (Havighurst, Neugarten and Tobin 1968), were early formal approaches to theorizing predominantly at the micro or social-psychological level. These theories can also be classified within the normative or structural dimension since the individual was conceptualized as reactive to societal demands and pressures, and there was little recognition of any interpretive process of meaning attribution. Research stimulated by the activity theory/disengagement theory debate found that satisfaction in later life could be predicted largely by health, income security and social integration. But few scholars theorized about the variations in these variables, and no one placed this topic into a life course perspective. To do so would have necessitated shifting attention away from the micro level to the macro-social structural level of analysis.

Social Structure and the Life Course

While much of the sociology of aging refers to social structure, Sewell (1992:1) is correct in observing that " 'structure' is one of the most important, elusive, and undertheorized concepts in the social sciences." One attempt to focus aging research more squarely on social structure was the age stratification perspective developed by Matilda White Riley and colleagues (Riley 1971; Riley, Johnson and Foner 1972; Riley, Foner and Waring 1988), which viewed age structure over the life course as a system of social roles (Burgess 1960; Cain 1964; Neugarten 1970). In this perspective social status and social roles are two key indicators of social structure. Following Linton's classic distinction, status is a position in a particular interaction pattern defined as "a collection of rights and duties" (Linton 1936:113), while role is the behavior of the occupant in that position. As Rosow (1976:458) notes, the terms are complementary, one referring to structure and the other to function. Status occupancy and ensuing role behavior constitute the link between the individual and society. The integration of the individual in both status and role is dependent on socialization – the learning and internalization of role expectations – and in turn, the integration of the individual in society.

Age is seen as a major criterion for entry into or exit from roles. As people age they move through the stages of family life, school, career trajectories, retirement and ultimately death. As Riley (1987:74) elaborates, "this movement with aging occurs partly by individual choice, but it is also channeled by the rules, linkages, and mechanisms governing role sequences within the social structure." For the most part, the individual was conceptualized as a bundle of roles and the perspective was largely normative; the individual was viewed as passive or reactive in the process of "continually being reallocated to new sets of roles and resocialized to perform them." (Riley 1987:4) Nonetheless, the age stratification perspective was influential in directing attention to the effects of social structure and structured social inequality over the life course. Compared to social roles occupied over early adulthood and midlife, later life social roles were seen as relatively devoid of content (Rosow 1976), prompting Riley and colleagues (Riley, Foner and Waring 1988; Riley, Kahn and Foner 1994) to use the term "structural lag" to identify the misfit between the social institutions that regulate aging and the productivity needs of new cohorts of older adults.

Age Structure and Mental Health over the Life Course

The age-structured organization of status and roles can be helpful in understanding mental health over the life course. The relationship between age and screening scales of self-reported depressive symptoms is characterized by a U-shaped curve that falls steeply during early adulthood, levels off at its lowest point in midlife, and climbs again around age 70 (Mirowsky and Ross 1992; Kessler, Foster, Webster and House 1992; Miech and Shanahan

2000; Mirowsky 1996; Clarke and Wheaton 2005). Depressive symptomatology typically declines over early adulthood as young adults assume major role commitments; this is now occurring in the late, rather than the early, 20s (Booth, Crouter and Shanahan 1999). This life stage, now frequently termed the "developmental" period of adulthood (Arnett and Taber 1994; Clarke and Wheaton 2005), is typified by gains in status and roles (early career path, marriage and asset acquisition) with associated mental health benefits. This period is followed by midlife (somewhere after age 40) where depressive symptoms level off at their lowest point, as the stability of marital and employment roles, and the social and economic status they confer, lead to optimal mental health (Mirowsky and Ross 1992; Mirowsky 1996). Finally the later stage of life is marked by role exits (involuntary retirement and widowhood), declines in physical function and decreased sense of control, which challenge mental health (Mirowsky and Ross 1992).

A growing body of work has unpacked the underlying reasons for this elevated risk, demonstrating that the elevation in depressive symptoms in older adults is largely a function of poor health, economic hardship, widowhood, retirement and declining social support (Mirowsky and Ross 1992; Blazer et al. 1991; Schieman et al. 2001). As Mirowsky and Ross (1992:199) aptly summarize, "were it not for the gain and loss of partners, jobs, and wealth, and the late-life declines in function and control, average levels of depression would decrease throughout the lifetime."

A Life Course Perspective on Mental Health

The work of Mirowsky and Ross (1992; Mirowsky 1996) and others (Blazer et al. 1991; Schieman et al. 2001) has been influential in debunking the myth that aging itself is depressing. Rather, the social structure of the life course, as a system of age-graded social statuses, has mental health consequences as persons enter and exit meaningful social roles. However, the practice of using a single wave of data to examine life course patterns in mental health (Mirowsky and Ross 1992; Schieman et al. 2001; Blazer et al. 1991) raises the possibility that cross-sectional associations between age and depression may simply be the result of cohort differences in status, not necessarily age changes in status over the life course.

The life course perspective emphasizes social and environmental change as it molds the course of individual lives (Riley 1979; Elder 1974; 1994; Elder and Johnson 2003). Aging is therefore recognized as a dynamic process linking biographical time as it intersects with changing social and historical contexts. We might therefore see variation in age patterns of depression as different cohorts experience different economic and historical events (Elder 1974; Mayer 1988; Elder, Shanahan and Clipp 1994). On the other hand, broad social change, such as the progressive increase in education among more recent birth cohorts (Hughes and O'Rand 2004), has the potential to have a uniform effect (George 1999).

A limited body of work has examined historical patterns in later life mental health and found conflicting evidence of cohort variation in depression. For example, an analysis of three waves of data (1965 to 1983) from the Alameda County Study (Roberts, Lee and Roberts 1991) examined depressive symptoms in 6,928 adults ages 16-94 and found higher rates of depressive symptoms for cohorts born before 1900. More recently, using four waves of data (1986-1996) from 3,782 older adults (age 65+) living in central North Carolina, Yang (2007) found that, after adjusting for covariates, older cohorts (born before 1910) exhibited more rapid decreases in depression with age than younger cohorts (born after 1911). However, by using data collected only on older adults, Yang (2007) was unable to examine cohort differences across the life span. These conflicting results may reflect differences in time

(1965-1983 vs. 1986-1996), populations (California vs. North Carolina), or may be the result of differential selection of less healthy adults.

Towards the Development of a Social Structural Theory of Mental Health

While earlier work has made a strong empirical contribution to our understanding of later life mental health, results are not explicitly presented within a coherent theoretical framework of social structure and mental health. While Mirowsky and Ross (1992) use theory to contextualize their findings within such psychological processes as maturity or physiological processes of decline (which they term "age as maturity" and "age as decline"), age as a structured system of roles and opportunities (Riley, Johnson and Foner 1972) is distilled to a simple role progression across the life span. However, the gendered structure of age-graded roles and their associated mental health consequences are theorized more explicitly in terms of differential access to resources as they shape work and family life (Mirowsky 1996).

We theorize that the socially structured, age-graded system of role allocation over the adult life course accounts for the decline in mental health in later life. We focus on employment and marital status as the primary social roles that structure the life course (Mirowsky and Ross 1992; Mirowsky 1996), and we run separate analyses for men and women given gender differences in mental health and patterning of social roles (Mirowsky 1996) (Calasanti 1993; DeViney and O'Rand 1988). Separate gender models also allow us to bypass the potential gender bias in mental health, whereby depressive symptoms may appear to increase in later life only because women live longer and tend to have higher rates of depression than men (Yang 2007).

We hypothesize that role entry into marriage and employment will account for better mental health in the developmental and midlife periods, while exit from marriage and employment in later life will mediate much of the decline in mental health. For analytic purposes these role transitions are considered as single events although we recognize that each role occupancy is part of a sequence of role transitions that vary in their timing and nature (Marshall, Clarke and Ballantyne 2001). Our statistical model implicitly controls for prior role transitions, but stops short of modeling the collective sequence or pattern of role transitions (Abbott and Tsay 2000).

Our model also includes race/ethnicity and socio-economic position, which are associated with mental health (Miech and Shanahan 2000; Riolo et al. 2005; Williams and Harris-Reid 1999), but also structure opportunities for role accumulation and the timing of role transitions over the life course (Jackson and Berkowitz 2005; Hogan 1978; Hayward, Hardy and Grady 1990). Coming from a racial/ethnic minority and/or a lower socio-economic background can increase risk of poor mental health through repeated spells of lost roles and opportunities (Ferraro 1987) with effects that multiply over the life course in the form of cumulative inequality or cumulative disadvantage (Ferraro and Shippee 2009; Ferraro, Shippee and Shafer 2009; O'Rand 1996, 2006).

The mental health consequences of these role transitions may operate though both economic and physical health pathways, and we examine the extent to which economic resources and poor health affect mental health directly, as age-graded resources, as well as indirectly by mediating the effects of lost marital and employment roles. However, we recognize the potential for a relationship operating in the reverse direction, where poor physical health or low income leads to marital and employment instability.

We use four waves of data from a nationally representative sample of American adults collected prospectively over a 15-year period. This allows us to incorporate both temporal

and developmental change by drawing on the life course perspective to theorize the dynamic nature of depressive symptoms over the adult life span as it intersects with historical time. We expect that depressive symptoms at any given age will vary over time because of changing patterns in social status (e.g., education) and social role variables (e.g., unemployment rates) across different historical periods. We therefore examine cohort differences in life span patterns of mental health over the 15 years of the study and theorize that worse mental health among early cohorts of older adults (due to cumulative exposure to greater economic and social hardship over the critical developmental periods of adulthood) will account for some of the elevation in depressive symptoms in later life (Dannefer 1987; Wilson, Shuey and Elder 2007). Because we are interested in sociological theorizing in aging, we focus on the depressive symptomatology of older adults, but also look at structural patterns of depressive symptoms across the developmental and midlife periods of adulthood as well.

Methods

Data

Data come from the Americans' Changing Lives survey (House et al. 1994; House et al. 2005; House 2007), a stratified, multi-stage area probability sample of non-institutionalized adults age 25 and older, living in the coterminous United States, and followed over a 15-year period. Blacks and adults age 60 and older were over sampled. The first wave of the survey was conducted in 1986 with 3,617 adults (68% sample response rate for individuals or 70% for households). Surviving respondents were re-interviewed in 1989 (N = 2,867, 83% of survivors), in 1994 (N = 2,562, including 164 proxy respondents, 83% of survivors), and again in 2001/2002 (N = 1,787, including 95 proxies, 74% of survivors). After weighting for sample design and non-response, the full ACL sample is representative at each wave of the age, gender and race distribution of the population ages 25 years and older living in the United States in 1986.

Measures

Mental Health was assessed with a short form (11 items) of the Center for Epidemiologic Studies Depression Scale (Radloff 1977; Kohout, Berkman, Evans and Cornoni-Huntley 1993). We focus on three items that measure depressive affect (felt depressed, sad, lonely) and four items that tap somatic symptoms (everything was an effort, sleep was restless, didn't feel like eating, could not get going).¹ For each item respondents were asked how often they experienced each symptom during the past week: hardly ever, some of the time, and most of the time. Responses were averaged to produce an index of depressive symptoms ranging from 1 to 3 for each wave, and log transformed to correct positive skew. To increase the interpretability of the results mean scores were multiplied by 100. Alpha reliabilities range from .79 to .80 across all four waves of the survey.

We assessed differences in depression scores across three ascribed social statuses: gender, race/ethnicity and education as an indicator of socio-economic position in early adulthood. Gender is a dummy variable coded 1 for female and 0 for male. Racial/ethnic Minority is a dummy variable coded 1 for non-white (black, Hispanic, Asian and Native American) and 0 for white. Socio-economic position was measured by Education, which tends to be completed by early adulthood, and was modeled with two dummy variables contrasting less than high school (0 to 11 years of completed education) and high school diploma (12 to 15

¹We focus on depressive affect and somatic symptoms because these are the items most commonly found in symptom-screening scales for depression (Kessler et al. 1992). However, the overall pattern of results was similar when using the full 11-item scale. Results were also similar when using separate indices for the negative affect and somatic symptom subscales.

years of education), with college degree or higher (16 or more years of education).² These are time-invariant indicators (measured only at baseline) that do not change markedly over the life course.

Time-varying variables capture the dynamics of changing social roles over the life course. We focus on employment and marital roles, as well as their economic and physical health consequences over the adult life cycle. Employment Status is captured by three dummy variables contrasting unemployed, retired and homemaker (women only) with those who are working for pay. Marital Status is indicated by three dummy variables contrasting those who are separated/divorced, widowed and never married with married. Income is represented by two dummy variables contrasting those with a combined household income less than \$10,000 per year, and \$10,000 to \$29,999 per year, to those with an income of \$30,000 or higher (inflation adjusted to 1986 dollars across all four waves). Due to item non-response on the income questions (8-18% missing data at each wave) we used imputed income values provided in the ACL data that were generated using the sequential regression imputation method in IVEware (Raghunathan, Solenberger and Van Hoewyk 2002; Raghunathan, Lepkowski, Van Hoewyk and Solenberger 2001).

We included two measures of physical health. At each wave we created an index of the number of medically diagnosed chronic Health Conditions self-reported in the past 12 months (e.g., heart disease, diabetes, cancer, arthritis, hypertension, stroke, emphysema). Functional Health was captured by a dummy variable contrasting those with no functional limitations with those reporting any functional limitations (i.e., difficulty doing heavy labor, work around the house, walking a few blocks, climbing stairs). We account for Birth Cohorts over the four waves of the ACL survey using five time-invariant dummy variables for each 10-year birth cohort, with birth year 1952-1961 as the reference category.

Statistical Analyses

We used growth curve models (Singer and Willett 2003) to examine life course trajectories of depressive symptoms, with separate models for men and women. Growth curve models belong to a general class of mixed models that take into consideration the clustering of observations within persons and also have the capacity to handle unbalanced designs (Raudenbush and Chan 1993). We analyzed a two-level model with multiple observations nested within persons over time. Age was used as the indicator of time, creating a synthetic cohort from ages 25 through 98. In order to facilitate parameter interpretation, we centered age at the initial point of data collection (setting age 25 to 0). To address non-linearity in depression trajectories over time/age, we used a parabolic model with a quadratic term.³

The structure of this model can be expressed by equations at two levels. At level 1 (withinperson model) depression scores at time *t* are nested within individuals (*i*):

 $logCESD_{it} = \pi_{0i} + \pi_{li}(age - 25)_{it} + \pi_{2i}(age - 25)^2_{it} + r_{it}$

(1)

 2 We chose to model categorical versions of education (and income) based on qualitatively meaningful cutpoints associated with socio-economic benefits and resources (e.g., high school diploma). But we also examined the effects in our models of using continuous forms of education and income. The mediating effects of these continuous variables for depressive symptoms were similar to those of their categorical counterparts, but in general the categorical versions tended to be more conservative mediators (e.g., categorical levels of education explained about 29% of the cohort differences in depressive symptoms vs. 37% for years of education). ³A concern with the quadratic model lies in the fact that the estimation of the age coefficients relies on a projection out to the extremes of the life course where there is less data. We therefore tested the robustness of our findings using a spline model with three separate spline age segments; the pattern was essentially identical.

The level-1 parameters are then modeled as a function of individual characteristics (at level two). The level two (between person) submodel assumes that depression trajectories vary across individuals, and we explicitly model these differences as follows:

$$\pi_{0i} = \beta_{00} + \sum_{c=1}^{c=5} \beta_{0c} X_{ci} + \sum_{q=1}^{q=12} \beta_{0q} Z_{qi} + e_{0i}$$
(2.1)

$$\pi_{1i} = \beta_{10} + e_{1i} \tag{2.2}$$

$$\pi_{2i} = \beta_{20} \tag{2.3}$$

Here, the intercept π_{0i} from Equation 1 is modeled as a function of the birth cohort dummies (c = 1 to c = 5) as well as the social status, role, health and income variables (q = 1 to q = 12). β_{0c} and β_{0q} represent differences in the initial depression scores (at age 25) for those in different birth cohorts and different social statuses, respectively, compared to the reference group. The cohort dummies have a fixed effect on the within-person intercept, making the age coefficients into synthetic cohort coefficients. We found no significant differences in the rate of change in depression over the life course across different birth cohorts or by different levels of the social status and social role variables, so there is no effect on the trajectory slope in equations 2.2 or 2.3. The residual errors (e_{0i} , e_{1i}) capture random variance in the intercept and linear age slope across persons. With unbalanced data over four survey waves we were constrained in the estimation of multiple random components (models failed to converge or resulted in non-positive definite matrices) (Singer and Willett 2003). We therefore estimate random effects for the intercept and the linear age effect only.

Substituting equations 2.1 through 2.3 into Equation 1 gives us the full composite model:

$$logCESD_{it} = \beta_{00} + \sum_{c=1}^{c=5} \beta_{0c} X_{ci} + \sum_{q=1}^{q=12} \beta_{0q} Z_{qi} + \beta_{10} (age - 25)_{it} + \beta_{20} (age - 25)^2_{it} e_{1i} + (age - 25)_{it} + e_{0i} + r_{it}$$

In this model e_{0i} (person-level variability around the intercept) is assumed to be normally distributed with a mean of 0 and variance τ_{00} , and e_{1i} (person-level variability around the age regression slope) is assumed to be normally distributed with mean of 0 and variance τ_{11} . The covariance between these person-level variance terms e_{0i} and e_{1i} is τ_{01} . All residual errors at the person-level are assumed to be independent from the within-person residuals (r_{it}).

We used the MIXED procedure in SAS to estimate linear models using full maximum likelihood. Analyses began by estimating an unconditional growth model and plotting the depression scores over the adult life course. We then examined how age patterns in mental health differ by birth cohort and by individual socio-demographic characteristics and role

positions. Nested models were compared according to three goodness-of-fit indices: (1. change in the -2 log likelihood (or deviance statistic), which follows a X^2 distribution with degrees of freedom equal to the difference in the number of parameters tested between models; (2. change in the Bayesian Information Criterion, which makes an adjustment for model parsimony; and (3. proportion of variance in CESD scores that is explained by each model (pseudo R²), calculated by squaring the correlation between the observed and predicted log CESD values.

All data and analyses are weighted to take account of different rates of selection into the initial baseline sample as well as differential non-response over the 15 years of the survey (older adults and those with health problems were more likely to drop out of the study, while women, white adults, and those from a higher socio-economic position were more likely to continue). Following the missing at random assumption, by including these variables in our model with maximum likelihood estimation, we assume that the depression score for a subject who drops out at a given wave is the same for a subject who remains at that wave, if they have the same covariates (Du et al. 2006).

Results

Table 1 describes the characteristics of the sample at baseline (in 1986). The majority of respondents were married, working for pay and free of any health problems or functional limitations at the first wave of the survey. However, there is also evidence of variability in education, marital status, employment and income. All of these may contribute to variations in depressive symptomatology over the life course, particularly as these social indicators change when modeled as time-varying variables.

Age Patterns in Depressive Symptoms

Results from the unconditional growth model are presented in Table 2 for women and Table 3 for men. For both men and women the coefficients characterize the typical U-shaped curve of depressive symptoms over the adult life course, and predicted trajectories are plotted in Figure 1.

As indicated in Figure 1, women report a greater frequency of depressive symptoms than men over most of the life span. But men and women share the same general U-shaped pattern of mental health and increasingly converge in their levels in later life. Depressive symptoms decline over early adulthood as young adults emerge from the "new adolescence" (Arnett and Taber 1994) and begin to acquire new statuses and roles (early career path, marriage and asset acquisition). This is followed by midlife when depression levels off at its lowest point. Finally the later stage of life (after age 65) is marked by increases in depressive symptoms, somewhat more so for men than women, resulting in modestly declining gender differences from age 75 onwards.

Results for the variance components (not shown) indicate that after modeling the effects of age, significant variation in depressive symptoms remains, at the initial status (intercept) as well as over the adult life course (p < .001).

Adjusting for Birth Cohort

In Model B, tables 2 and 3, we see evidence that depressive symptoms at any age vary depending on birth cohort. Depression scores are at their lowest among the most recent cohorts. Symptoms increase among earlier cohorts, and at a given age are the highest for those born before 1912 (figures 2 and 3). No significant variation was found in depression slopes by birth cohort (no interactions between age trajectory and birth cohort dummies).

Adjusting for Race/Ethnicity and Socio-economic Position

Models C through F in tables 2 and 3 add the social status and role variables to assess the degree to which the U-shaped pattern in depressive symptoms is mediated by social position, age-graded changes in social roles, as well as financial and health assets. Model C adds the two fixed social statuses: race/ethnicity and education. In any given birth cohort, depressive symptoms occur more frequently over the life course for persons in racial/ethnic minority groups and for those with less than a college education.⁴ There was no evidence that any of the socio-demographic characteristics (nor any of the other social status/role variables) varied in their effect on depression by age or by birth cohort (no statistically significant interaction effects between social status and either age or birth cohort).

Predicted CES-D scores adjusted for social status are plotted in figures 4 and 5 for women and men. Having a higher education and being white results in a considerable downward adjustment in depressive symptoms over adulthood, and is particularly notable among older women for whom the adjusted trajectories increase less rapidly in later life. Thus, were they not more likely to be less educated (especially those in racial/ethnic minority groups), women could expect to experience better mental health over the entire adult life course. In addition, for both men and women education explains part of the observed cohort differences in mental health (e.g., differences in the coefficients across birth cohorts are attenuated between models B and C). Thus, cohort improvements in mental health are partly due to progressive increases in education across historical time.

Adjusting for Marital and Employment Status

Column 4 in tables 2 and 3 adds the effects of marital and employment roles on mental health patterns. For men and women, depression scores are significantly higher over the life course for those who are separated/divorced, widowed or never married compared to those who are married.⁵ Those who are unemployed and looking for work also experience higher rates of depressive symptoms at all stages of the life course. But for both men and women, self-defined retirement status is not associated with an increase in depressive symptoms. Compared to women who are working for pay, women who define themselves as homemakers have higher rates of depressive symptoms. For both genders, inclusion of these social role variables attenuates the upturn in the depression slope after age 65, and for women results in a much flatter trajectory of depressive symptoms in later life (Figure 4). For men, a positive slope still remains at this stage. Thus, lost marital and employment roles account for much of the upturn in late life depressive symptoms for men and especially women.

Adjusting for Income and Health

Higher household income and better health⁶ are associated with lower depression scores over the life course for both men and women (models E and F, tables 2 and 3). For men there is a gradient in mental health by income such that depression scores are significantly higher at successively lower levels of income. Among women, only very low incomes are associated with a significant increase in depressive symptoms over adulthood, but the income gradient is similar to men. For men and women, income mediates the benefits of education for mental health, but significant educational disparities in depressive symptoms remain. Similarly, part of the mental health effects of lost marital roles and unemployment

 $^{^{4}}$ Education was more strongly related to the somatic symptoms subscale than the negative affect subscale.

⁵Marital role loss (or the absence of a marital partner) was strongly and positively related to negative affect but not related to somatic symptoms. Both indicators of health (functional limitations and number of chronic conditions) were strongly and positively related to both the

negative affect and somatic symptoms subscales in both genders.

status is mediated by income, but there remains a net negative association of these lost social roles with depressive symptoms. These variables explain some of the cohort differences in depressive symptomatology.

Accounting for low income and poor health effectively eliminates the positive depression slope among older men (Figure 5) and for women results in a declining trajectory in depressive symptoms after age 65 (Figure 4). The predicted depression scores for healthy, socioeconomically-advantaged older women are actually lower than those for their male peers after age 75 (slopes for this birth cohort decline significantly faster in women compared to men in a combined gender analysis with statistical interaction terms). Adjusting for health also shifts the midlife depression trajectory for men from an upward slope to a downward slope (Figure 5). Thus, continued improvements in mental health in midlife are possible for healthy, socially-advantaged married men who continue to work for pay.

The addition of the physical health variables (Model E-F, Table 3) indicates that physical health mediates the relationship of education and income to mental health. Similarly, the positive effect of unemployment on depressive symptoms is partly explained by physical health problems, particularly among men. But unemployment and education also have net direct effects on mental health that are not explained by physical health. Moreover, physical health problems have a negative effect on mental health independent of other variables.

At this point in our analyses, the positive depression slopes in later life for both men and women have been effectively explained by lower education, poor health, unemployment, being unmarried and having lower incomes. If adults were to remain married, employed, with high incomes, high education and good health, depressive symptoms would decline steadily over the life course. These predicted trajectories are illustrated in figures 6 and 7. However, net cohort differences in depressive symptoms remain, suggesting that additional factors over time account for some of the differences in depression trajectories among successive cohorts of American adults. Together, the social status and role variables, along with cohort and historical time, explain about a fifth of the variance in depression scores for men and women (R-squared for Model F in tables 2 and 3).

Discussion

Towards the Development of a Social Structural Theory of Mental Health

We set out to further develop and test a social structural model of mental health in later life. Building on existing literature we theorized that age-graded social roles explain much of the mental health differences over adulthood. One of the main strengths of our study is the use of a nationally representative cohort longitudinal sample of adults ages 25 and older, surveyed four times over a 15-year period, to We tested the basic tenets of our theoretical model using time-varying social statuses across the life course. Longitudinal data also allow us to separate the relationship between social roles and depressive symptoms at different life stages from cohort differences in social status and role occupancy. Similar to results observed with cross-sectional data (Mirowsky and Ross 1992; Blazer et al. 1991; Schieman et al. 2001) we found that social status and role occupancy (represented by gender, minority status, education, marital status and work, as well as their consequences for economic status and health) explained, to a large extent, the age-graded patterning of depressive symptoms over mid to late adulthood. This suggests that if adults could remain married, in productive and socially connected roles, healthy and with adequate income, mental health has the potential to improve over the life course. The increase in depressive symptoms in later life is primarily a function of lost marital roles and unemployment (and their economic consequences), as well as poor physical health. In addition, we also saw evidence of a strong cohort effect where mental health over the life course has been improving for successive

birth cohorts, in part due to increases in education. Thus cross-sectional increases in depressive symptoms observed in later life (Mirowsky and Ross 1992; Kessler et al. 1992; Schieman et al. 2001; Blazer et al. 1991) partly reflect cohort effects, not the mental health effects of aging *per se*.

The empirical findings of this research lend support to a structural theory of mental health. Depressive symptoms over adulthood are significantly influenced by the occupancy of agegraded social roles. This is consistent with the age stratification perspective and also work in social gerontology (Burgess 1960) that drew attention to the negative consequences of the "role-less role of the aged." However, we have pushed beyond earlier work by theorizing that age structures and the patterning of social roles therein, are associated with patterned changes in mental health over the life course.

While we place primary emphasis on social structure, we recognize that structure is not theorized explicitly. It is loosely conceptualized as age structure in the form of role allocative processes that are generally based on age. Age structures can be seen as the social contexts in which individuals live out their lives (Marshall 2005). Our structural model is connected to a tripartite model of the life course based on an orderly progression from schooling to career, to retirement (Cain 1964; Kohli 1986).⁷ In many ways, our theory echoes the earlier structural theories of modernization (Burgess 1960), activity (Havighurst, Neugarten and Tobin 1963) and disengagement (Cumming and Henry 1961), which in general terms, saw aging as a process of progressive disengagement of the individual from social structure, defined in terms of normative roles.

One of the main critiques of the age stratification perspective is its highly deterministic view of life course patterns, where individuals are seen simply as bundles of roles (Hendricks and Leedham 1992). Recent scholars have expanded on this normative approach by emphasizing the dynamic interpretive nature of age-based social structures as they are shaped by political and economic interests (Walker 1981, 2005; Townsend 1981), particularly the role of the State through its control of work, education and marriage transitions (Mayer 1988, 1997; Leisering and Leibfried 1999; Marshall and Mueller 2003). While we have not explicitly focused on these interpretive elements in social structure, underlying power relations in the allocation of social roles over the life course could be easily incorporated. For example, role exit from the labor force (in the form of retirement) is shaped by state or corporate interests as reflected in the age of eligibility for receipt of social security benefits. Thus, the structured exit from the work role in later life is shaped by underlying relations of power in both state and corporate interests. We demonstrate the associated mental health consequences resulting from the age-structuring of the work life, particularly for men and women who are still actively (but unsuccessfully) seeking work in later life.

While women have higher depression scores than men throughout most of adulthood, we also observed a convergence in mental health in later life among men and women as differences in social positions are controlled and hence reduced. For men and women with similar statuses on race, education, marital status, employment status, income and health, depression scores in later life converge, and women's predicted depression scores actually fall below those for men. Thus, much of the gender difference in later life mental health can be explained by differences in role occupancy and the benefits of role accumulation over the life course. Women's engagement in economically productive work roles has historically been constrained by state and corporate incentives for married women to avoid work in paid employment, which has adverse consequences for asset accumulation and pension benefits

⁷However, for future cohorts the mental health consequences of job loss may take on a different meaning as work becomes much less ordered and predictable (Marshall, Clarke and Ballantyne 2001).

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(Brűckner 2004; McMullin 2000; McMullin and Ballantyne 1995; O'Rand and Henretta 1999; Padavic and Reskin 2002; Pai and Barrett 2007).

In contrast to early normative theories, our theoretical model incorporates temporal and historical change from a life course perspective. Being old has become less depressing. As a result, cross-sectional increases in depressive symptoms observed with age (Mirowsky and Ross 1992; Kessler et al. 1992) reflect changes in the life experiences of older adults over historical time as well as over the life course. Our results suggest that historical increases in education (Hughes and O'Rand 2004) account for some of the overall improvement in mental health. Other possible influences include the introduction of medications to treat depression since the late 1980s (Olfson et al. 2002). Moreover, if older cohorts are more reluctant to report depressive symptoms to a health care provider, or less likely to interpret their symptoms as depression, they may be less likely to receive medical treatment (Sarkisian, Lee-Henderson and Mangione 2003), resulting in higher depressive symptomatology among older cohorts.

In summary, the underlying premise of this study is that the age-graded structure of the life course as it is shaped by macro-level social institutions (and their evolution over time) is critical for understanding patterns of mental health over mid to late adulthood. Although we focused primarily on the latter part of the life course, our model did less well at understanding mental health patterns in early adulthood. Contrary to our hypothesis, the declines in depressive symptoms observed earlier in adulthood remain substantially unexplained by social roles and status, with marriage and employment having very little effect on the rate of decline. This may reflect the presence of other underlying development processes, such as psychological maturation, which was not captured in our analyses. Nonetheless, a social structural model was useful in explaining midlife and later adult mental health and our results suggest that improvements in the socio-economic and health (assuming that the economic and health improvements persist).

While others have emphasized micro-level interpretive approaches that view society as "the creation of its members, the product of their construction of meaning, and of the action and relationships through which they attempt to impose meaning on their historical situations," (Dawe 1970:216) our model is predominantly structural, giving priority to the social system over the individual in the explanation of mental health in later life. Many have argued that individual agency and subjective biography (e.g., Hughes 1971) play a key role in creating variability in age patterns and even shaping age trajectories. We agree that the individual's interpretation of a role can make a difference in the effect of that status on mental health (Wheaton 1990). Consistent with Atchley's theory of continuity (Atchley 1999) and selective optimization with compensation theory (Baltes and Baltes 1990) individuals can be resilient in finding ways to adapt to role change or role loss. The creative structuring of role occupancy is an ongoing interpretive process that is distinct from the structural notion of role taking. Thus, structure never operates without reflexivity (Archer 1995, 2007) and the social theorist would do well to supplement the structural theory with the explanatory language of interpretive sociology and social psychology. However, we do argue that this reflexive process is less important for shaping patterns of mental health over the life course at a population level, than the age and life course structuring of society within a particular historical period.

Recent American sociology has placed a primacy on interpretive theorizing. Yet, this may have come at the neglect of an appreciation of social structure and its role in individual lives. Early leaders in the field (e.g., Nathan Glazer, Seymour Martin Lipset, Robert Merton, Paul Lazarsfeld, Talcott Parsons) were preoccupied with understanding the structures in our

society in order to better understand the limits that are placed on individual freedom and societal change (see Lipset 1994 for a review). In seeking to provide more interpretive balance, contemporary directions in sociology appear to have underemphasized the influence of social structure. We seek an appropriate stance that recognizes the limits to determinism but also the limits to freedom in human action.

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Figure 1. Depressive Symptoms over the Adult Life Course Source: Americans' Changing Lives Study (1986-2001)



Figure 2. Depressive Symptoms over the Adult Life Course by Birth Cohort, Females Source: Americans' Changing Lives Study: 1986-2001



Figure 3. Depressive Symptoms over the Adult Life Course by Birth Cohort, Males Source: Americans' Changing Lives Study: 1986-2001



Figure 4. Predicted Depressive Symptoms over the Adult Life Course by Birth Cohort, Females Note: For clarity, only three birth cohorts are illustrated: Born 1952-1961, born 1922-1931, born 1911 or earlier



Figure 5. Predicted Depressive Symptoms over the Adult Life Course by Birth Cohort, Males Note: For clarity, only three birth cohorts are illustrated: Born 1952-1961, born 1922-1931, born 1911 or earlier.



Figure 6. Predicted Depressive Symptoms over the Adult Life Course by Birth Cohort, Females



Figure 7. Predicted Depressive Symptoms over the Adult Life Course by Birth Cohort, Males

Table 1

Weighted Percents and Means for Study Sample Characteristics

	Weighted Me	an (SD) or %
Variable	Females	Males
Age (in years) (range 25-96)	48.12 (15.51)*	45.98 (17.82)
Birth Cohort (%)		
1952-1961	27.03*	31.26
1942-1951	23.72	22.66
1932-1941	13.43	15.81
1922-1931	13.95	13.55
1912-1941	14.08^{*}	10.63
1911 or earlier	7.79	6.08
Depressive symptoms (range 0-110)	37.78 (24.78)*	30.68 (27.21)
Race (%)		
Minority	17.23	15.73
White	82.77	84.27
Education (%)		
Less than high school	26.24	24.85
High school diploma	57.90*	51.07
College degree	15.86*	24.08
Marital Status (%)		
Married	63.72*	75.74
Separated/Divorced	14.28*	8.74
Widowed	13.55*	3.31
Never married	8.45*	12.21
Employment Status (%)		
Employed	55.15 [*]	77.19
Unemployed	8 71*	6.63
Retired	13.64*	16.18
Homemaker (women only)	22 50	n/a
Annual Household Income (%)	22.50	ii/ a
< \$10,000	23 47*	14.35
\$10.000-\$29.999	40.30	40.81
\$30,000 or higher	36.22*	44.84
Number of chronic health conditions (range 0-7)	1.16(1.20)*	85 (1.32)
Functional Health (%)	1.10 (1.20)	
Any limitation	10.10*	11 72
	18.48	11.72
No limitations	81.52*	88.28
Ν	2,259	1,358

N = 3,617

Source: Americans' Changing Lives Study (1986)

SD = standard deviation

* indicates statistically significant gender differences

Table 2

Growth Curve Models for Depressive Symptoms over the Life Course, Females

	Unconditional Growth Model	+ Birth Cohort	+ Sociodemographics	+ Social Roles	+ Income	+ Health
Fixed Effects	Model A	Model B	Model C	Model D	Model E	Model F
Intercept [†]	48.37***	46.16^{***}	36.48***	32.82***	32.81 ^{***}	34.21 ^{***}
Birth Cohort ^a						
1942-1951		5.15**	4.30^{**}	4.43**	4.29**	4.02***
1932-1941		6.09	4.50^{*}	4.77*	4.34*	4.22*
1922-1931		9.56***	6.76***	7.05***	6.40 ^{**}	7.64***
1912-1921		10.30^{***}	6.61 ^{**}	7.21**	6.42 ^{**}	8.28***
1911 or earlier		16.38^{***}	11.70^{***}	$12~42^{***}$	11.45^{***}	13.38^{***}
$Minority^b$			5.72***	3.75***	3.18**	3.01^{**}
< High school education $^{\mathcal{C}}$			17.86^{***}	16.14^{***}	14.40^{***}	$11\ 28^{***}$
High school education c			6.68***	6.22^{***}	5.57***	4 79***
Separated/Divorced ^d				4.05^{***}	3.86^{***}	4.06***
Widowed ^d				6.02^{***}	4.94***	5.05***
Never married ^d				5.86***	4.83**	3.91^{*}
$Unemployed^{e}$				9.03***	8.44***	5.76***
Retired ^e				66.	.49	43
Homemaker ^e				2.48**	2.01^*	.64
Income $<$ \$10K f					4.49***	3.64***
Income $$10-30$ Kf					1.18	1.24
Health conditions						3.06***
Functional limitations ⁸						11.79^{***}
Rate of Change						
Age	89	96	93***	79***	76***	91***
Age^{2}	$.013^{***}$.011***	.010***	.007***	.006***	.005***

ixed Effects			•			
	Model A	Model B	Model C	Model D	Model E	Model F
Joodness-of-Fit Statistics						
seudo R ²	.01	.02	.08	.11	.12	.20
urce: Americans' Changing Live	ss Study: 1986-2001					
= 2,259						
og CESD at age 25)						
<.05						
p < .01						
* p <.001 (two-tailed tests)						
eference group is 1952-1961						
eference group is white						
eference group is college degree	e or higher (16+ years of educat	ion)				
eference group is married						
eference group is employed						
sference group is income \$30,00	00 or higher					
eference group is no functional l	limitations					

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Table 3

Growth Curve Models for Depressive Symptoms over the Life Course, Males

	Unconditional Growth Model	+ Birth Cohort	+ Sociodemographics	+ Social Roles	+ Income	+ Health
Fixed Effects	Model A	Model B	Model C	Model D	Model E	Model F
Intercept †	37.87***	36.77***	31.44***	29 42 ^{***}	28.68 ^{***}	29.15 ^{***}
Birth Cohort ^a						
1942-1951		3.17	3.03	3.36^*	3.40^{*}	3.34^{*}
1932-1941		9.02^{***}	7.01**	8.14^{***}	8.00 ^{***}	8.10***
1922-1931		9.48^{***}	7.00**	8.69***	8.47***	7.58***
1912-1921		8.18**	5.10	7.12**	6.65*	6.54^{*}
1911 or earlier		14.02^{***}	9.42*	11.62^{**}	11.25^{**}	12.87***
$Minority^b$			4.96^{***}	4.33^{***}	3.97**	3.90 ^{**}
$<$ High school education $^{\mathcal{C}}$			$11 \ 20^{***}$	9.30***	7 87***	5.32**
High school education c			3.99**	3.43*	3.02^{*}	1.87
Separated/Divorced ^d				7 25 ^{***}	6.63***	6.00^{***}
Widowed ^d				11.01^{***}	10.40^{***}	9.10^{***}
Never married ^d				4.56**	3.73*	4.35**
$Unemployed^{e}$				$11 32^{***}$	10.42^{***}	6.68***
Retired ^e				1.40	86.	09
Income $<$ \$10K f					4.35**	2.93^{*}
Income $$10-30Kf$					1.72^{*}	1.76^*
Health conditions						3.08***
Functional limitations ^g						14.58^{***}
Rate of Change						
Age	76***	90***	89	86***	81	83***
Age^{2}	.012***	$.011^{***}$.011***	.010***	.009***	.006***
Goodness-of-Fit Statistics						

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	Unconditional Growth Model	+ Birth Cohort	+ Sociodemographics	+ Social Roles	+ Income	+ Health
Fixed Effects	Model A	Model B	Model C	Model D	Model E	Model F
Pseudo R ²	.01	.01	.06	.11	.11	.19
Source: Americans' Changing	Lives Study: 1986-2001					
N = 1,358						
$^{\dagger}(\mathrm{log}\ \mathrm{CESD}\ \mathrm{at}\ \mathrm{age}\ 25)$						
* p < .05						
** p < .01						
*** p < .001 (two-tailed tests)						
^a Reference group is 1952-196	1					
bReference group is white						
c Reference group is college de	sgree or higher (16+ years of educat	ion)				
dReference group is married						
e Reference group is employed						

 $f_{\rm R}$ eference group is income \$30,000 or higher $^{\rm S}$ Reference group is no functional limitations