DRAFT: PLEASE DO NOT CITE WITHOUT PERMISSION FROM AUTHORS

"Parenthood and Trajectories of Distress among Women in Later Life: Race Differences"

Naomi J. Spence*

Daniel E. Adkins

University of North Carolina at Chapel Hill

"Parenthood and Trajectories of Distress among Women in Later Life: Race Differences"

ABSTRACT

Although mental health consequences of parenthood are well-documented, little research has investigated over-time change or race differentials. Analysis of data from the National Longitudinal Survey of Mature Women shows that parental status is influential among white, but not black, women in later life. Specifically, childless white women have lower levels of depressive symptoms than white mothers in mid-life, but the groups converge in late life. The benefits of childlessness are greater for never married white women than other marital statuses. Sensitivity analyses demonstrate that the pattern described above holds generally for white women, but it is more dramatic among white women who died during the course of the study. The results suggest that 1) important race differences may be masked by analyses that combine black and white women and 2) longitudinal analyses help to clarify discrepancies in previous studies of the relationship between parenthood and distress.

"Parenthood and Trajectories of Distress among Women in Later Life: Race Differences"

It has been called a "social fact" that parenthood has negative psychological consequences, particularly for mothers (Umberson and Gove 1989; Umberson and Williams 1999). Although generally accepted, cautions have been offered since this finding is based largely on research on parents with children in the home, which shows parents to be on average worse off across mental health indicators. Thus, while parenthood may have some emotional benefits, these benefits appear to be outweighed by the costs of having children in the home. However, given that the primary costs of having children generally lessen as women move into the later years of life, the long-term effects of having children are less clear, and little research has examined this issue. Moreover, this "social fact" may not apply universally across all social groups. Race/ethnic comparisons are largely lacking in this area (for exception see Sudha et al. 2006), although parenthood may have different meanings and consequences for African American and white women. This study seeks to address these gaps by conducting a longitudinal analysis of race differences in psychological distress comparing older childless women and mothers. With demographic shifts toward increasing childlessness and an increasingly diverse older population, it is important to better understand how childlessness may differentially affect women as they age.

BACKGROUND

The relationship between parenthood and mental health has been studied rather extensively. Within this body of research, there is evidence of life course and racial differentiation. First, studies on the psychological well being of parents with young children largely reports worse mental health for parents compared to childless adults (McLanahan and Adams 1987; Umberson and Williams 1999). However, studies of older adults or empty nest

parents (those with only non-residential adult children) suggest negative or no effects of childlessness (Evenson and Simon 2005; Koropeckyj-Cox 1998; Mirowsky and Ross 2003; Umberson and Gove 1989; Zhang and Hayward 2001). In terms of race differences in the relationship between parenthood and distress, Sudha and colleagues (2006) analyze data from a community-based sample of older adults and find a significant effect of childlessness among black but not white women. Specifically, they report lower levels of depression among black childless women compared to black mothers of one to five children. This effect is accounted for by social support.

Overall, existing research suggests important social variations in the effect of parenthood on later psychological well-being. Still, research would benefit from clarification due to key limitations of existing studies. For example, studies vary in the age of respondents with no longitudinal analyses following women over significant stages of the life course. Moreover, research on race differences in the relationship between parenthood and psychological distress is restricted to a cross sectional analysis of limited generalizability. Finally, life course and racial variation is likely related to social, economic, and health statuses associated with both parental status and distress. A comprehensive investigation of mechanisms is missing from the literature. This study attempts to overcome these limitations by conducting longitudinal, race-specific analysis of the relationship between parenthood and distress among women from the ages of 52 to 81. Our analyses examine socioeconomic, health, and marital statuses, as well as parental characteristics, as potential mediators and/or moderators of the relationship between parental status and psychological well being.

The Effect of Children on Psychological Well-Being across the Life Course

A life course approach to the study of health directs our attention to those things that individuals experience earlier in life that have lasting implications for well-being as we age. The circumstances of early life and young adulthood set into motion a range of events that may have long-term implications for well-being throughout life. Among women, fertility is a central element of the life course that shapes opportunities, attitudes, decisions, behaviors, and health. Becoming a mother is associated with social, economic, emotional, and physical costs and benefits, the balance of which is likely to shift over the life course. Children place substantial burden on parent's time, energy and economic resources and conflict with other realms of life such as marital satisfaction or paid employment (Bird 1997). Although these burdens may become less relevant as women and their children age, they may have long run negative repercussions via marital dissatisfaction and dissolution, physical weathering, and financial depletion.

Children also provide a sense of satisfaction and legitimacy. Parenting is a highly valued social role, particularly during the middle part of the 20th century (Koropeckyj-Cox, Pienta, and Brown, 2007) when the women in this study were moving through the childbearing period. The emotional benefits of having children may last throughout the life course but become more apparent once the burdens are reduced. On the other hand, the stigma associated with childlessness may have long-term consequences. Moreover, although attitudes may be changing among more recent cohorts, prior research indicates that most people do not believe that childlessness is advantageous and most agree that the childless will be lonelier at older ages (Blake 1979).

It is also possible that the effect of childlessness on women's well-being varies over the life course, as the meaning of childlessness does (Alexander, Rubinstein, Goodman, and

Luborsky 1992). Indeed, qualitative work by Alexander and colleagues (1992) finds that regrets about not having children tend to surface or increase later in life. It may be then that mental health consequences become evident and the earlier apparent benefits of childlessness diminish.

Race Differences in the Effects of Childlessness

Because of distinctive lived experience with children and the increased stresses faced as minorities (Roxburgh, Stephens, Toltzis, and Adkins 2001), African American women may value children differentially or be differentially affected by the costs of childbearing. Research on the value of children has shown that black women are more likely than white women to report economic-utilitarian values of children and expect them to contribute to the family when they grow older (Hoffman and Manis 1979). In particular, a greater percentage of black women than white women listed help with household chores (10.9 percent versus 2.3 percent) and economic security in old age (5.4 percent versus 1.2 percent) as specific advantages of having children. Moreover, a higher percentage of black women value children because they help deter loneliness. Still, black mothers tend to perceive less support from their children (Umberson 1992), though they may coreside with children more often (Speare and Avery 1993). Given that black mothers often have unmet, high expectations for their children's support in later life, black mothers are apt to find this period more difficult than expected.

Black and white women may also differ in the mental health consequences of childlessness because of exposure to disadvantages across the life course. For example, parenting may be more stressful for black mothers because of their social circumstances (Umberson 1992). In earlier work on the consequences of not having children, Beckman and Houser (1982: 244) suggested that childlessness should only have a negative impact on those in disadvantaged circumstances, as characterized by marital, financial, and health status. Because black women

face greater disadvantage across these statuses, we might expect childlessness to have a greater effect on black women. Moreover, black women, particularly of the cohort studied here, may have a greater stake in the parental role because racial discrimination in the workplace may have left them less powerful in the workplace and thus less attached to work roles (Milkie et al., 2008; Stack 1974). Greater emphasis on the parental role among black women could result in a larger effect of parental status for this group.

Influences on the Link between Parenthood and Psychological Well-Being

Research must account for the possibility that any observed relationship between parental status and later life mental health is spurious since the same negative factors associated with parental status are correlated with psychological distress. Failure to account for these processes may lead to a bias in the estimation of the effects of parenthood on psychological distress in later life. Research has identified several potential mechanisms linking parenthood to worse health outcomes. These can be characterized as being related to socioeconomic, health, and marital statuses and parental characteristics (e.g., the timing of childbearing and number of children).

Socioeconomic status may importantly mediate the relationship between parental status and distress for several reasons. First, some research finds childless elderly adults to be more financially secure than their counterparts with children (Rempel 1985), pointing to long-term socioeconomic consequences of parental status. Second, education and labor force participation, for example, may differentiate childless adults and mothers as they compete, in a sense, with childbearing behavior for women's time and attention. Finally, socioeconomic status is an independent, robust predictor of distress (Dowrenwend et al. 1992; Lorant et al 2003; Ritsher et al 2001).

Physical Health and depression have been linked in a substantial body of literature (Ormel, Rijsdijk, Sullivan, Sonderen, and Kempen 2002; Taylor and Lynch 2004; Turner and Noh 1988), particularly at older ages (Meeks et al. 2000; Yang 2007; Yang and George 2005). Moreover, differentials in physical health by parental status have been demonstrated. Using a sample of women past their childbearing years, Grundy and Holt (2000) find that women with children demonstrate a significantly lower risk of disability compared to childless women. Because it may be affected by parental status and affect depression, it is important to control for physical limitations as a potential mediator or confounder.

Marital status is yet another important predictor of both psychological well-being and reproductive patterns, and has been one of the primary considerations in research on the relationship between parenthood and well-being. This body of research provides mixed evidence of marital status as a moderator of the relationship between parenthood and mental health. On one hand, Zhang and Hayward (2001) find that being unmarried (never married, divorced, widowed) does not put the childless at a disadvantage in terms of depression. Another study finds no differences in general social psychological well-being by parental status among married women but finds the childless worse off than mothers among the widowed (Beckman and Houser 1982). According to Koropeckyj-Cox and colleagues (2007), unmarried childless women are more distressed than are mothers who were married and gave birth between the ages of 19 and 24. Here, both marital status and parental characteristics are important in producing the disadvantage experienced by the childless.

Parental characteristics may serve to differentiate mothers from childless women. When and how many children a woman has can have lasting consequences for socioeconomic and physical health statuses (Rempel 1985; Spence 2008), which in turn can influence psychological

distress. For example, the timing of childbearing is found to be central in differentiating parents from childless adults. In particular, the relationship between parenthood and depression has been shown to depend upon age at first birth (Mirowsky and Ross 2002). In their study, having a first birth before age 23 is associated with elevated levels of distress relative to childless adults, while delaying to age 30 is associated with psychological benefits of motherhood (Mirowsky and Ross 2002). In addition to the timing of childbearing, number of children may be important. In a recent study of women aged 50 and older, Sudha and colleagues (2006) find greater depression among childless adults compared to those with one to five children. However, this finding applies to African American but not white women and is accounted for by social support. In sum, parental characteristics may attenuate any observed differences in distress by parental status.

Coresidence may also be a link between parenthood and psychological distress in later life, particularly to the extent that it serves as a proxy for social support (Sudha et al., 2006). Among the benefits of parenthood, adult children serve as primary sources of support and care (Bachrach 1980; Beckman and Houser 1982). Children endow their mothers with social capital that childless adults are not afforded (Ishii-Kuntz and Seccombe 1989; Schoen et al. 1997), and childless women may lack important support structures (Choi 1994). Indeed, it has been suggested that parenthood is "good insurance against loneliness and isolation in old age" (Glenn and McLanahan 1981). This may be particularly true for older parents with coresident children.

Most parents with adult coresident children report satisfying relationships and positive interactions (Aquilino and Supple 1991). However, having a coresident child may not be beneficial as social support explanations would predict. Aging mothers who receive care from their children may be in need of care because of poor health. Older women may live with their offspring for reasons such as declining health or loss of a spouse through death or divorce (Ward,

Logan, and Spitze 1992). These same reasons may lead adult children to live with their mothers. That is, not all parent-adult child coresident arrangements are the result of the mother's needs. Regardless of the precise reason for coresidence, it is likely that stressful circumstances are associated with the coresidence of older women and their children.

RESEARCH QUESTIONS

In this paper, we examine race differences in the relationship between childlessness and trajectories of depression from ages 52 to 81 years. This study addresses three primary research questions. First, we ask whether race differences exist in the relationship between childlessness and depression as women age and whether these differences exist net of socioeconomic and health status correlates of depression. Following that we ask whether the timing of childbearing, number of children, and parent-child co-residence matter in differentiating childless adults and parents in terms of psychological distress. Finally, we examine whether marital status mediates or moderates the effects of childlessness.

DATA AND METHODS

Data

We use data from the National Longitudinal Survey of Mature Women (NLS-MW). Multistage probability sampling was used to draw a representative sample of 5,393 civilian, non-institutionalized women aged 30-44 years in 1967, with an oversample of black women (see US Department of Labor 2005 for more detailed information). Of those women, 94 percent participated in the baseline (1967) interview (N=5,083). Since then, the cohort has been interviewed a total of 20 times through 2003, when 2,237 (44 percent) of the original respondents were surveyed. Most sample attrition is due to the death of the respondent (N =

1,485 of the original respondents), with refusals (N=1,036) and failure to locate (N=325) making up the rest.

Although the NLS-MW was originally designed to study labor market behavior of women, it is well-suited for the study of women's health. The primary benefit of this dataset is the longitudinal nature of data collection. Because women were followed for a lengthy period of time, the NLS-MW was able to incorporate foci relevant to women's lives as they aged. Accordingly, later waves of the survey began collecting measures of health status more regularly. This includes the regular collection of data on distress. In addition, the NLS-MW gathered data on fertility histories and regularly collected socioeconomic and family status correlates of health.

Measures

The dependent variable, *psychological distress*, is measured using a short version of the commonly used Center for Epidemiological Studies' Depression Scale (CES-D; Radloff, 1977). Measures of the CES-D are available in six waves of data from 1989 through 2003 when the women in our sample span the ages of 52-81 years old (Table 1). To ensure comparability across measurement points, we employ a 7-item version of the CES-D scale. Respondents were asked the frequency in the past week with which: 1) they were unable to shake the blues, 2) they had trouble keeping their mind on tasks, 3) everything took extra effort, 4) they had restless sleep, 5) they were lonely, 6) they were sad, 7) they could not get going. Responses indicate the frequency with which respondents experienced a given feeling and range from 0 to 3, where 0 is rarely or none of the time and 3 is most or all of the time. Responses are summed, producing a possible range of 0-21. The reliability of the scale across years ranges from alpha= .82 - .84.

<Table 1 about here>

The primary predictor variable, *parental status*, comes from fertility histories collected by 1982 when the sample was aged 45-59 years old. By these ages, almost all childbearing is complete. Therefore, estimates are not biased by the inclusion of mothers whose fertility may not be complete. Women were asked about up to 16 children born to them.

Analyses control for educational attainment, employment status, and physical health. *Educational attainment* is modeled using a series of dummy variables representing: less than high school education, some high school but did not graduate, high school graduate (ref), and more than high school. *Employment status* and *home ownership* are dichotomous, time-varying measures. *Income* is time-varying and measured in logged thousands of dollars. *Physical health* is measured using a continuous, time-varying index of the amount of difficulty that an individual has in doing seven activities. These activities include 1) walking one block, 2) using stairs or inclines, 3) reaching, 4) sitting for long periods, 5) stooping, kneeling, crouching, 6) lifting/carrying heavy weights, and 7) fingering or grasping.

Potential mediators and moderators examined include marital status, the timing of first and last birth, parity, and parent-child coresidence. *Marital status* is measured using a series of time-varying dummy variables representing never married, widowed, and divorced or separated, with married as the reference category. Data on marital status are drawn from the same six waves of data as the dependent variable. The *timing of first birth* is a dichotomous indicator of whether the respondent had their first child as a teenager, in reference to those who began childbearing at age 20 or older. The *timing of last birth* is a dichotomous indicator of whether the respondent gave birth at "advanced maternal age"—35 years or older. We measure *high parity* using a dichotomous indicator of whether the respondent had five or more children.

Parent-child coresidence is measured with a time-varying indicator of whether the respondent and at least one biological child were living in the same household.

<Table 2 about here>

ANALYTIC STRATEGY

Linear mixed models (i.e., hierarchical linear models [HLM]) are used to analyze the longitudinal depressive symptoms data (Goldstein 1995; Bryk and Raudenbusch 1992). Mixed models are specifically designed for the analysis of clustered data, such as the longitudinal data analyzed here, and estimate two types of parameters—fixed and random effects (Bryk and Raudenbusch 1992). Fixed effects are analogous to regression coefficients, while random effects describe the degree to which a subject's coefficient value deviates from the fixed effect, or mean coefficient value. The mixed model framework offers a number of advantages in the analysis of longitudinal data. First, the method allows investigation of substantive questions—for instance, whether some individuals' depressive symptoms increase faster with age than others (Willett, Singer and Martin 1998). Second, the method accounts for the dependency of observations due to clustering, which is necessary for accurate coefficient estimation and significance testing (Goldstein 1995). Finally, any number of waves of data can be accommodated, the occasions of measurement need not be equally spaced, and data-collection schedules can differ among individuals (Willett, Singer and Martin 1998).

Our investigation of the influence childlessness on women's later life trajectories of depression begins by modeling the unconditional growth curve for the full sample. Comparisons of various functional forms (i.e. linear, quadratic, and cubic), indicated that the shape of the average trajectory followed a curvilinear pattern, with depressive symptoms first decreasing,

then increasing in old age.[1] Thus, the unconditional trajectory is best modeled as a quadratic function of age characterized by random intercept, linear and quadratic age slope components written as:

Level 1 model: $$y_{ti} = \pi_{0i} + \pi_{1i}Age_{ti} + \pi_{2i}Age^2_{ti} + e_{ti}$$

Level 2 model: $$\pi_{0i} = \beta_{00} + r_{0i}$$
$$\pi_{1i} = \beta_{10} + r_{1i}$$
$$\pi_{2i} = \beta_{20} + r_{2i}$$

Combined model: $$y_{ti} = (\beta_{00} + \beta_{10}Age_{ti} + \beta_{20}Age^2_{ti}) + (r_{0i} + r_{1i}Age_{ti} + r_{2i}Age^2_{ti} + e_{ti})$$

In the level 1 model, y_{ti} is the CES-D score for person i at time t; π_{0i} is the intercept of the growth trajectory for person i; π_{1i} is the linear component of the slope of the trajectory for person i; π_{2i} is the quadratic component of the slope of the trajectory for person i; Age_{ti} is the age of individual i at time t; Age^2_{ti} is the squared age of individual i at time t, and e_{ti} is the within-individual residual for person i at time t. In the level two model, β_{00} is the mean (or fixed) intercept of the age trajectory; β_{10} is the mean linear component of the slope of the age trajectory; β_{20} is the mean quadratic component of the slope of the age trajectory; r_{0i} is the residual (or random effect) of the intercept term for person i; r_{1i} is the random effect of the linear component of the slope for person i; and r_{2i} is the random effect of the linear component of the slope for person i. The combined model clarifies that the observed repeated measures of y can be expressed as an additive combination of a fixed component of growth ($\beta_{00} + \beta_{10}Age_{ti} + \beta_{20}Age^2_{ti}$) and a random component of growth ($r_{0i} + r_{1i}Age_{ti} + r_{2i}Age^2_{ti} + e_{ti}$).

---

[1] Likelihood ratio tests were used to determine the significance of the fixed and random effects that were added to the model in each of the analysis steps. This test yields the deviance of the model which is defined as - 2xloglikelihood. The deviance difference (between 2 models) is asymptotically χ^2 distributed, with the number of degrees of freedom equal to the difference in number of estimated parameters between the 2 models. To judge the significance of parameters in the full model, each parameter was removed from the model, and a likelihood ratio test with 1 degree of freedom was used to examine whether its effect was significant in this full model.

Next, we investigated racial differences in the trajectories, with preliminary analyses indicating significant racial differences in both the unconditional trajectories and in the correlations of the key covariates to the outcome. Based on these findings and our review of literature discussed above, we chose to stratify models by race/ethnicity (i.e., black and white) to investigate these racial differences.

After determining the general modeling strategy of quadratic age-based growth curves stratified by race/ethnicity, we then sequentially introduced groups of covariates in a nested fashion to examine the influence of childlessness, as well as SES, parental characteristics, and marital status. Thus, the first presented model examines the effects of attrition (see attrition discussion below). We then examine the influence of childlessness on later life depression trajectories. In our third and fourth presented model we examine the robustness of the childlessness findings controlling for the effects of SES/employment and physical limitations, respectively. The last three nested models examine potential mediation of the childlessness findings by other childbearing characteristics, marital status, and marital status × childlessness interactions, respectively. All analyses were conducted in Stata 9.2; scripts are available upon request.

Attrition

Significant attrition was present in the data with 654 cases (20.89 percent of the analysis sample) attriting due to death, and 812 (25.93 percent) attriting due to other causes. We handle attrition by explicitly modeling differences between the three groups. This was achieved by introducing indicators of attrition status (non-attriters, attrition due to death, and attrition due to other causes) as predictors of all trajectory parameters (i.e. the random coefficients for the

intercept, age, and age squared)[2]. This allowed us to estimate a different mean trajectory for each attrition status. Given that the effects of attrition status were significant for some models, we include these attrition status parameters in all subsequent analyses. Graphic representations of predicted trajectories refer to non-attriters.

While the method described above effectively allows modeling of the differences in growth curves by attrition status, it assumes that covariate effects on the trajectories are constant across attrition status groups. In order to test this assumption, after arriving at our final model we conduct sensitivity analyses in which we stratify the final model by attrition status to examine differences in covariate effects by attrition status.

RESULTS

Model 1 examines black-white differences in later life depression trajectories, controlling only for attrition status (Table 3). The results of Model 1 show that older white and black women have very different average depression trajectories. White women's trajectories are characterized by a relatively low intercept (i.e., the trajectory starting point for the sample—at age 52), a relatively steep decline in depression levels and a bit of an upturn toward the end of the trajectory. This contrasts with mean trajectories for older black women, which are characterized by relatively high intercepts, and a relatively flat slope. Overall, this model shows evidence for persistent white advantage in unadjusted later life female depression trajectories— white women begin the trajectory at lower levels and this advantage grows over most of the trajectory.

<Table 3 about here>

---

[2] Sensitivity analyses indicate that this method generates equivalent coefficients to stratifying the sample by attrition status, but maximizes power resulting in smaller standard error estimates.

The influence of childlessness is examined in Model 2. We model childlessness as potentially influencing both the trajectory intercept, as well as the two slope components. Among white women, all effects are significant. Childless white women are shown to have much lower levels of depression at baseline but increasing levels of depression as they age, while white mothers experience diminishing levels of depression as they age. Thus, in sum, relative to white mothers, childless white women are better off in early middle age, but experience increasing levels of depression as they age. Among black women there is no evidence of childlessness influencing depression levels at any age.

Model 3 examines the potential mediating influence of socioeconomic status. The inclusion of education, income, home ownership and employment status in the model change the effects of childlessness very little, though many of these factors are independently significant. Model 4 adds a control for physical health status, which is a strong independent predictor for both races, but does not alter our conclusions regarding the effects of childlessness for white women. However, it is noteworthy that controlling for SES and physical health explains virtually all of the racial disparity observed in the earlier models. Thus, racial differences in women's later life depression trajectories are shown to be largely due to racial differences in the closely related factors of SES and physical health.

<Table 4 about here>

Model 5 of Table 4 examines the influence of various childbearing characteristics. The results of this model show little to no significant effects for either race. The only exception is a significant association between having a child in the home and higher depression levels. All former findings were found robust here. Next, Model 6 presents the influence of marital status. Marital status appears to be more salient to the mental health of white than black women, as

divorced and widowed white women were shown to suffer higher levels of depression across later life while black women were not. Finally, in Model 7 we find little evidence of marital status moderating the effects of childlessness, with the exception of childlessness being especially protective among white never married women.

Racial differences in the effects of childlessness are visualized in Figure 1 for both unadjusted models (Model 2) and the final adjusted models (Model 6). These results indicate that childless white women are relatively better off in mid-life though the psychological consequences of motherhood decline as women age. Since white women experience increasing levels of depression as they age, they converge with white mothers at late ages. This contrasts the scenario among black women where childbearing appears to be relatively unimportant.

<Figure 1 about here>

In a final sensitivity analysis, we investigated whether our childlessness findings for white women held across attrition statuses (see appendix 1).[3] The motivating logic here, restated from the methods section, is that the approach to handling attrition taken thus far explicitly models attrition status differences in the age-based growth curves but assumes that covariate effects on these growth curves are equal across attrition statuses. Here we test this assumption by stratifying the sample by attrition status and rerunning the final model (Model 7 of Table 4). The results of this analysis indicate that our conclusions regarding the effects of childlessness among white women are consistent across attrition groups in terms of direction, but vary in magnitude.[4] Specifically, while on average all groups of childless white women had relatively low baseline depression levels followed by an increase in mid life and a plateau in late life, this

---

[3] While there are other notable differences in the final model estimates across attrition groups, in the interest of concision and topical relevance we focus on variation in the effects of childlessness and leave further exploration to future research.

[4] We do not discuss significance testing in the sensitivity analysis, as stratifying the sample resulted in diminished power, making the comparison of p-values less meaningful than the comparison of coefficient values.

pattern was more dramatic among attriters—particularly women who died during the course of the study. Thus, white childless women who died during the course of the study tended to have rather low levels of depression at baseline, but as they aged, and approached death, the absence of children became increasingly detrimental, as evidenced by their very high rate of increasing depression. The implications of this are discussed below.

DISCUSSION

Prior research on the relationship between parental status and depression has largely focused on younger adults and/or examined this relationship cross-sectionally. Our results suggest that this work has overlooked important details in trajectories of depression. In particular, we find white mothers to be more depressed than their childless counterparts until near retirement ages when levels of depression essentially converge. That is, parental status differences are nominal in the later years of life, though women are psychologically better off through midlife if they did not have children. The observed convergence is due to a notable decline in depression experienced by mothers during later life when depression levels for childless women are essentially flat.

These results differ from cross sectional studies controlling for race that find no significant net differences by parental status (Koropeckyj-Cox et al. 2007; Zhang and Hayward 2001). As Figure 1 demonstrates, examining one point in the life course of middle-aged and older women or the average over a relatively small span of years could mask important differences that occur as women age. In general, the results are consistent with the notion that mothers become less depressed as their children age and the direction of the flow of emotional and financial resources reverses to the benefit of mothers. Moreover, the childless appear more depressed at ages when social support from children may matter most. Thus, these findings

suggest that social support from children is an important mental health buffer for white women in later life. However, while we examined the role of having a co-resident child, there the data unfortunately contain no direct measures of social support from children over time. Therefore, further research will be needed to determine the extent to which social support accounts for the observed patterns among white women.

We hypothesized that black mothers' unmet, high expectations for their children's support in later life would lead them to find this period more difficult than expected. Moreover, we suggested that a greater emphasis on the parental role among black women could result in a larger effect of parental status for this group. Instead, we found no significant differences by childlessness among black women. This finding also differs from recent analyses by Sudha and colleagues (2006) that find childless black women to be more depressed than mothers with fewer than six children. This incongruity could be attributed to regional specificities arising from their use of a non-nationally representative sample or from the cross-sectional nature of their data. In these analyses, we use data from a nationally representative sample of women to examine trajectories of depression across time. In doing so, we also find no evidence of a suppressed effect of childlessness for black women once controls are included for socioeconomic, health, and marital statuses.

Childlessness may not significantly differentiate black women for several reasons. First, a culture of mothering the children of relatives and neighbors could compensate for one's lack of childbearing (Sudha et al. 2006). These fictive kin could fill any emotional void felt by childless women, even into older ages. In this study, we had no information on shared childrearing or fictive kin. It is also possible that larger networks of social support (e.g., the prominence of the black church and a tendency toward living in larger households) generally offset any negative

consequences of lacking certain social roles, like motherhood. This may also explain why we found no significant effects of being unmarried among black women. In general, marital and parental roles have been shown to matter little for the well-being of middle-aged and older black women (Coleman, Antonucci, Adelmann, and Crohan 1987).

Limitations and Future Directions

One limitation of this study comes from a lack of information on quality of relationships with children for parents. We have suggested that unmeasured aspects of social support may be responsible for observed differences between mothers and childless white women; however, this may not be the case where mothers and daughters have poor quality relationships. Indeed, Koropeckyj-Cox (2002) and Milkie et al. (2008) show that poor relationships contribute to greater distress. Data with additional information on the quality of relationships is needed to investigate how this might matter for the link between parenthood and depression.

With the data employed in this paper, we were not able to distinguish between voluntary and involuntary childlessness. It is possible that the psychological consequences depend largely on whether a woman is childless by choice or circumstance. Still, the US is a strongly pronatalist society, particularly as the women of the NLS-MW were moving through the reproductive years (Koropeckyj-Cox et al. 2007; Rowland 2007). Thus voluntary childlessness was likely to be relatively uncommon among this cohort of women.

Finally, a life course perspective highlights the intersection of individual and historical time (Elder, Johnson, and Crosnoe 2004). The women studied here were either born or coming of age during the Great Depression; some were mothers of the Baby Boom. Significant historical events such as this make the cohort's experiences unique from other cohorts. This period encouraged the search for traditional homemaker roles (Elder 1974). Currently old cohorts have

among the lowest rates of childlessness (Rowland 2007), with more recent cohorts are

characterized by higher rates of childlessness. Future research is needed to investigate whether

the patterns found here apply across cohorts.

Table 1. CES-D summary statistics by race and age

Age	White				Black			
	Mean	SD	N	Range	Mean	SD	N	Range
52	3.89	5.03	27	0- 16	6.08	5.21	12	0- 16
53	3.58	4.12	163	0- 21	4.86	5.21	43	0- 19
54	3.16	3.96	156	0- 21	4.25	4.55	57	0- 15
55	3.56	4.63	144	0- 20	5.52	5.72	46	0- 21
56	3.09	3.61	130	0- 20	4.79	4.59	52	0- 18
57	2.87	3.55	127	0- 18	5.40	5.01	43	0- 18
58	3.33	4.11	149	0- 21	4.09	4.20	43	0- 16
59	3.10	3.69	250	0- 21	4.19	4.28	97	0- 21
60	3.40	4.16	302	0- 21	4.52	4.84	126	0- 19
61	3.18	3.96	393	0- 21	4.26	4.89	126	0- 21
62	3.27	4.08	423	0- 20	4.49	4.89	146	0- 21
63	2.87	3.80	498	0- 21	4.09	4.70	160	0- 19
64	3.50	4.20	524	0- 21	5.08	5.05	177	0- 19
65	3.23	4.02	602	0- 21	4.73	4.80	201	0- 21
66	3.25	3.88	647	0- 19	4.35	4.89	222	0- 21
67	2.94	3.77	673	0- 21	4.89	4.82	231	0- 20
68	2.90	3.83	582	0- 21	4.40	4.73	202	0- 21
69	3.14	4.26	564	0- 21	4.74	4.64	201	0- 21
70	3.12	3.92	569	0- 21	4.36	4.86	193	0- 20
71	3.50	4.09	558	0- 21	4.60	4.47	194	0- 19
72	3.37	3.95	559	0- 21	4.07	4.16	173	0- 19
73	3.39	4.01	533	0- 21	4.80	4.20	173	0- 19
74	3.53	4.08	436	0- 21	4.48	4.84	141	0- 21
75	3.35	3.87	418	0- 17	4.55	4.75	119	0- 21
76	3.72	3.99	314	0- 20	4.91	4.41	95	0- 20
77	3.58	3.76	266	0- 18	4.23	4.31	83	0- 18
78	3.88	4.52	197	0- 21	4.40	4.50	60	0- 18
79	3.54	4.07	177	0- 21	4.09	3.85	45	0- 15
80	4.37	4.68	84	0- 18	4.59	3.47	27	0- 11
Total	3.28	4.00	10465	0- 21	4.55	4.68	3488	0- 21

Table 2. Predictor summary statistics at first observation

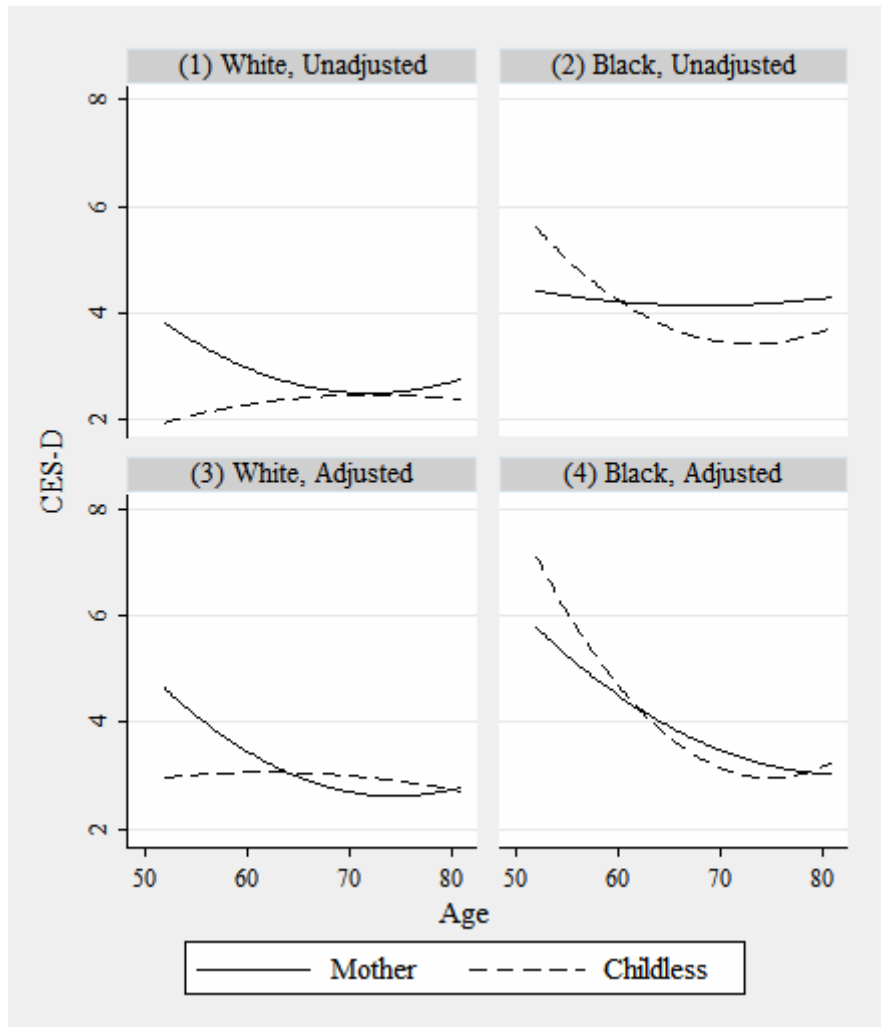| Predictors	White (N=2311)			Black (N=820)		
	Mean	SD	Range	Mean	SD	Range
Died	0.18	0.38	0- 1	0.29	0.45	0- 1
Other attrition	0.27	0.45	0- 1	0.22	0.41	0- 1
Childless	0.09	0.29	0- 1	0.08	0.27	0- 1
Less than HS	0.11	0.32	0- 1	0.36	0.48	0- 1
Some HS	0.19	0.39	0- 1	0.34	0.47	0- 1
HS graduate	0.49	0.50	0- 1	0.22	0.42	0- 1
More than HS	0.21	0.41	0- 1	0.08	0.28	0- 1
Income	9.88	1.22	0- 12.01	9.81	1.40	0.73- 12.20
Home ownership	0.85	0.36	0- 1	0.62	0.48	0- 1
Employed	0.44	0.50	0- 1	0.40	0.49	0- 1
Physical limits	2.09	3.16	0- 17	2.96	3.51	0- 19
High parity (>5)	0.10	0.30	0- 1	0.37	0.48	0- 1
Teen first birth	0.21	0.41	0- 1	0.50	0.50	0- 1
Last birth > age 35	0.21	0.41	0- 1	0.30	0.46	0- 1
Child in household	0.27	0.44	0- 1	0.44	0.50	0- 1
Never married	0.03	0.18	0- 1	0.07	0.25	0- 1
Divorced	0.11	0.31	0- 1	0.24	0.43	0- 1
Widowed	0.16	0.37	0- 1	0.30	0.46	0- 1

Table 3. Racial differences in trajectories of CES-D predicted by attrition status, SES, physical limits and childlessness

	Model 1		Model 2		Model 3		Model 4	
	white	black	white	black	white	black	white	black
Fixed Effects								
Intercept	3.654***	4.457***	3.803***	4.409***	4.504***	4.751***	3.780***	4.014***
Age	-0.117***	-0.041	-0.132***	-0.033	-0.155***	-0.101	-0.180***	-0.176**
Age^2	0.004***	0.001	0.005***	0.001	0.005***	0.002	0.004***	0.003
Died	1.044	-0.053	1.146*	-0.021	0.817	-0.491	0.501	-0.464
Died*age	0.094	0.151	0.082	0.145	0.074	0.142	0.080	0.084
$Died*age^2$	0.001	-0.003	0.001	-0.003	0.001	-0.002	-0.002	-0.001
Other attrition	-0.398	1.41	-0.397	1.425	-0.553	1.072	-0.661	0.638
Other attrition*age	0.111*	-0.071	0.110*	-0.073	0.101	-0.029	0.113*	-0.01
Other attrition*age^2	-0.004*	0.001	-0.004*	0.001	-0.003	0.000	-0.004*	-0.001
Childless			-1.869**	1.183	-1.823**	2.172	-1.913***	1.746
Childless*age			0.184*	-0.176	0.182*	-0.261	0.199*	-0.216
Childless*age^2			-0.006*	0.004	-0.005*	0.006	-0.006*	0.006
Less than HS					2.127***	1.807***	1.396***	1.163***
Some HS					0.771***	1.257***	0.547***	0.890**
More than HS					-0.589*	-0.549	-0.403**	-0.218
Income					-0.061***	-0.044	-0.042	-0.066
Home ownership					-0.468***	-0.424*	-0.272*	-0.112
Employed					-0.501***	-1.209***	-0.231*	-0.492*
Physical limits							0.394***	0.419***
Random Effects								
Level 1 Residual	2.758***	3.384***	2.758***	3.384***	2.765***	3.392***	2.711***	3.298***
Level 2 Intercept	3.375***	4.070***	3.340***	4.070***	3.209***	3.859***	3.100***	3.970***
Level 2 Age	0.381***	0.514***	0.379***	0.514***	0.382***	0.519***	0.350***	0.541***
Level 2 Age^2	0.013***	0.016***	0.013***	0.016***	0.013***	0.016***	0.011***	0.017***
Log Likelihood	-27793.6	-9906	-27795.9	-9910.5	-27690.9	-9871.1	-27210.6	-9689.2

Table 4. Racial differences in trajectories of CES-D predicted by attrition status, childlessness, SES, functional limitations, childbearing characteristics and marital status

	Model 5		Model 6		Model 7	
	white	black	white	black	white	black
Fixed Effects						
Intercept	3.642***	4.072***	3.442***	3.898***	4.640***	5.779***
Age	-0.173***	-0.175**	-0.179***	-0.181**	-0.180***	-0.182**
Age^2	0.004***	0.003	0.004***	0.003	0.004***	0.003
Died	0.502	-0.42	0.526	-0.428	0.516	-0.443
Died*age	0.077	0.073	0.062	0.076	0.064	0.079
Died*age^2	-0.001	-0.001	-0.001	-0.001	-0.001	-0.001
Other attrition	-0.643	0.666	-0.589	0.643	-0.606	0.638
Other attrition*age	0.111*	-0.015	0.106*	-0.01	0.107*	-0.010
Other attrition*age^2	-0.004*	-0.001	-0.004*	-0.001	-0.004*	-0.001
Childless	-1.793**	1.662	-1.741**	1.466	-1.677**	1.340
Childless*age	0.194*	-0.216	0.200*	-0.215	0.200*	-0.183
Childless*age^2	-0.006*	0.006	-0.005*	0.006	-0.005*	0.006
Less than HS	1.358***	1.221***	1.328***	1.201***	1.296***	1.223***
Some HS	0.529***	0.948***	0.527***	0.958***	0.516***	0.971***
More than HS	-0.410**	-0.252	-0.364**	-0.209	-0.356*	-0.237
Income	-0.048	-0.067	-0.007	-0.055	-0.008	-0.054
Home ownership	-0.263*	-0.111	-0.126	-0.04	-0.121	-0.045
Employed	-0.236*	-0.483*	-0.301**	-0.499*	-0.301**	-0.505*
Physical limits	0.394***	0.419***	0.392***	0.417***	0.392***	0.417***
High parity (>5)	-0.174	0.042	-0.164	0.077	-0.167	0.057
Teen first birth	0.062	-0.264	0.023	-0.274	0.031	-0.289
Last birth > age 35	0.199	0.206	0.213	0.217	0.220	0.214
Child in household	0.228*	-0.032	0.149	-0.069	0.145	-0.069
Never married			-0.213	0.845	2.360	0.535
Divorced			0.589***	0.148	0.551***	0.188
Widowed			0.991***	0.339	1.014***	0.398
Never married*childless					-2.807*	0.839
Divorced*childless					0.580	-0.759
Widowed*childless					-0.333	-0.756
Random Effects						
Level 1 Residual	2.711***	3.298***	2.701***	3.297***	2.701***	3.297***
Level 2 Intercept	3.104***	3.986***	3.084***	4.009***	3.084***	4.006***
Level 2 Age	0.352***	0.542***	0.344***	0.544***	0.344***	0.541***
Level 2 Age^2	0.011***	0.017***	0.011***	0.017***	0.011***	0.017***
Log Likelihood	-27211.1	-9690.3	-27170	-9689.1	-27165.4	-9685.0

Figure 1. Predicted CES-D Trajectories by Race and Childlessness

REFERENCES

Alexander, Baine B., Robert L. Rubinstein, Marcene Goodman, and Mark Luborsky. 1992. "A
    Path Not Taken: A Cultural Analysis of Regrets and Childlessness in the Lives of Older
    Women." *The Gerontologist 32*: 618-626.

Aquilino, William S. and Khalil R. Supple. 1991. "Parent-Child Relations and Parent's
    Satisfaction with Living Arrangements when Adult Children Live at Home." *Journal of
    Marriage and the Family* 53: 13-27.

Bachrach, Christine A. 1980. "Childlessness and Social Isolation among the Elderly." *Journal of
    Marriage and the Family* 42: 627-637.

Beckman, Linda J. and Betsy Bosak Houser. 1982. "The Consequences of Childlessness on the
    Social Psychological Well-Being of Older Women. *Journal of Gerontology* 37: 243-250.

Bird, Chloe E. 1997. "Gender Differences in the Social and Economic Burdens of Parenting and
    Psychological Distress." *Journal of Marriage and the Family* 59(4): 809-823.

Blake, Judith. 1979. "Is Zero Preferred? American Attitudes toward Childlessness in the 1970s."
    Journal of Marriage and the Family 41: 245-257.

Bryk, Anthony S. and Stephen W. Raudenbusch. 1992. *Hierarchical Linear Models:
        Applications and Data Analysis Methods*. Newbury Park, Sage Publications, London.

Choi, Namkee G. 1994. "Patterns and Determinants of Social Service Utilization: Comparison of
        the Childless Elderly and Elderly Parents Living with or Apart from Their Children." *The
        Gerontologist* 34: 353-362.

Coleman, Lerita, M., Toni C. Antonucci, Pamela K. Adelmann, and Susan E. Crohan. 1987. "Social Roles in the Lives of Middle-Aged and Older Black Women. *Journal of Marriage and the Family* 49: 761-771.

Dohrenwend, Bruce P., Levav, I., Shrout, P. E., Schwartz, S., Navch, G., Link, Bruce G., A. Skodol, and A. Stueve. 1992. "Socioeconomic Status and Psychiatric Disorders: The Causation-Selection Issue." *Science* 255: 946–952.

Evenson, Ranae J. and Robin W. Simon. 2005. "Clarifying the Relationship between Parenthood and Depression." *Journal of Health and Social Behavior* 46: 341-358.

Glenn, Norval D. and Sara McLanahan. 1981. "The Effects of Offspring on the Psychological Well-Being of Older Adults." *Journal of Marriage and the Family* 43: 409-420.

Goldstein H. 1995. *Multilevel Statistical Models*. Wiley: New York.

Grundy, Emily and Gemma Holt. 2000. "Adult Life Experiences and Health in Early Old Age in Great Britain." *Social Science and Medicine* 51(7):1061-1074.

Hoffman, Lois Wladis and Jean Denby Manis. 1979. "The Value of Children in the United States: A New Approach to the Study of Fertility." *Journal of Marriage and the Family* 41: 583-596.

Ishii-Kuntz, Masako and Karen Seccombe. 1989. "The Impact of Children on Social Support Networks throughout the Life Course." *Journal of Marriage and the Family* 51: 777-790.

Koropeckyj-Cox, Tanya. 1998. "Loneliness and Depression in Middle and Old Age: Are the Childless More Vulnerable?" *Journals of Gerontology: Social Sciences* 53B: S303-S312.

Koropeckyj-Cox, Tanya, Amy M. Pienta, and Tyson H. Brown. (2007) "Women of the 1950s and the 'normative' life course: The implications of childlessness, fertility timing, and marital status for psychological well-being in late midlife." *International Journal of Aging and Human Development,* 64 (4): 299-330.

Lorant, V., D. Deliege, William Eaton, A. Robert, P. Philippot, and M. Ansseau. 2003. "Socioeconomic Inequalities in Depression: A Meta-Analysis. *American Journal of Epidemiology* 157: 98-112.

McLanahan, Sara and Julia Adams. 1987. "Parenthood and Psychological Well-Being." *Annual Review of Sociology* 5: 237-257.

Meeks, Suzanne, Stanley A. Murrell, and Rochelle C. Mehl. 2000. "Longitudinal Relationships between Depressive Symptoms and Health in Normal Older and Middle-Aged Adults." *Psychology and Aging* 15(1):100-109.

Milkie, Melissa A., Alex Bierman, and Scott Schieman. 2008. "How Adult Children Influence Older Parents' Mental Health: Integrating Stress-Process and Life-Course Perspectives." *Social Psychology Quarterly* 71: 86-105.

Mirowsky, John and Catherine E. Ross. 2002. "Depression, Parenthood, and Age at First Birth." *Social Science and Medicine* 54:1281-1298.

-------. 2003. *Social Causes of Psychological Distress.* 2nd Edition. New York: Aldine de Gruyter.

Ormel, Johan, Fruhling V. Rijsdijk, Mark Sullivan, Eric van Sonderen, and Gertrudis I.J.M.

    Kempen. 2002. "Temporal and Reciprocal Relationship Between IADL/ADL Disability and

    Depressive Symptoms in Late Life." *Journal of Gerontology: Psychological Sciences* 57B

    (4): P338-P347.

Radloff, Lenore S. 1977. "The CES-D Scale: A Self-Report Depression Scale for Research in the

    General Population." *Applied Psychological Measurement,* 1:385-401.

Rempel, Judith. 1985. "Childless Elderly: What are They Missing?" Journal of Marriage and the

    Family 47: 343-348.

Ritsher, J. E. B., Warner, V., Johnson, J. G., & Dohrenwend, Bruce P. 2001. "Inter-generational

    Longitudinal Study of Social Class and Depression: A Test of Social Causation and

    Social Selection models." *British Journal of Psychiatry* 178: s84-s90.

Rowland, Donald T. 2007. "Historical Trends in Childlessness." *Journal of Family Issues* 28:

    1311-1337.

Roxburgh, Susan, Richard C. Stephens, Philip Toltzis, and Ina Adkins. 2001. "The Value of

    Children, Parenting Strains, and Depression among Urban African American Mothers."

    Sociological Forum 16: 55-72.

Schoen, Robert, Young J. Kim, Constance A. Nathanson, Jason Fields and Nan M. Astone. 1997.

    "Why Do Americans Want Children?" *Population and Development Review* 23(2):333-

    358.

Speare, Alder and Roger Avery. 1993. "Who Helps Whom in Older Parent-Child Families?"

    Journal of Gerontology 48:S64-S73.

Spence, Naomi J. 2008. "The Long-Term Consequences of Childbearing: Physical and

Psychological Well-Being of Mothers in Later Life." *Research on Aging*

Stack, Carol. 1974. *All Our Kin: Strategies for Survival in a Black Community*. New York:

Harper and Row.

Sudha, Shreeniwas, Elizabeth J. Mutran, Ishan C. Williams, and Chirayath Suchindran. 2006.

"Childbearing History and Self-Reported Well-Being in Later Life: Contrasting Older

African American and white Women." *Research on Aging* 28(5): 599-621.

Taylor, Miles G. and Scott M. Lynch. 2004. "Trajectories of Impairment, Social Support, and

Depression in Later Life." *Journal of Gerontology: Social Sciences* 59B(4): S238-S246.

Turner, R. Jay and Samuel Noh. 1998. "Physical Disability and Depression: A Longitudinal

Analysis." *Journal of Health and Social Behavior* 29: 23-37.

Umberson, Debra. 1992. "Relationships between Adult Children and Their Parents:

Psychological Consequences for Both Generations." *Journal of Marriage and the Family*

54: 664-674.

Umberson, Debra and Walter R. Gove. 1989. "Parenthood and Psychological Well-Being:

Theory, Measurement, and Stage in the Family Life Course." *Journal of Family Issues*

10(4): 440-462.

Umberson, Debra and Kristi Williams. 1999. "Family Status and Mental Health." Pp. 225-253 in

Handbook of the Sociology of Mental Health, edited by C.S. Aneshensel and J.C. Phelan.

New York: Kluwer Academic/Plenum Publishers.

Willet John B, Judith D. Singer, and N.C. Martin. 1998. The Design and Analysis of

Longitudinal Studies of Development and Psychopathology in Context:

Statistical Models and Methodological Recommendations. *Development and*

Psychopathology 10: 395-426.

Yang, Yang. 2007. "Is Old Age Depressing? Growth Trajectories and Cohort Variations in Late Life Depression." Journal of Health and Social Behavior 48(1): 16-32.

Yang, Yang and Linda K. George. 2005. "Functional Disability, Disability Transitions, and Depressive Symptoms in Late Life." *Journal of Aging and Health* 17(3):263-292.

Ward, Russel, John Logan, and Glenna Spitze. 1992. "The Influence of Parent and Child Needs on Coresidence in Middle and Later Life." *Journal of Marriage and the Family* 54:209-221.

Zhang, Zhenmei and Mark D. Hayward. 2001. "Childlessness and the Psychological Well-Being of Older Persons." *Journals of Gerontology: Social Sciences* 56B:S311-S320.

Appendix 1. White women, final model stratified by attrition status

	No attrition	Died	Other attrition
Fixed Effects			
Intercept	4.554***	5.600***	3.894***
Age	-0.165***	-0.204*	-0.059
Age^2	0.003***	0.004	0.000
Childless	-0.598	-5.800**	-2.272
Childless*age	0.060	0.642*	0.335
Childless*age^2	-0.001	-0.019*	-0.010
Less than HS	1.420***	2.243***	0.652
Some HS	0.418*	0.741	0.526
More than HS	-0.400*	-0.167	-0.417
Income	-0.008	-0.117	0.048
Home ownership	-0.165	0.164	-0.092
Employed	-0.253*	-1.101**	-0.104
Physical limits	0.367***	0.474***	0.407***
High parity (>5)	-0.135	0.042	-0.471
Teen first birth	0.015	-0.134	0.055
Last birth > age 35	0.227	-0.137	0.399
Child in household	0.092	0.224	0.226
Never married	-2.782	13.234***	1.545
Divorced	0.515**	0.834	0.452
Widowed	1.093***	1.234*	0.718**
Never married*childless	2.077	-12.585***	-1.629
Divorced*childless	-1.230	5.260**	0.754
Widowed*childless	-1.331*	0.801	1.145
Random Effects			
Level 1 Residual	2.595***	3.178***	2.804***
Level 2 Intercept	2.624***	3.848***	3.620***
Level 2 Age	0.253***	0.440***	0.565***
Level 2 Age^2	0.007***	0.015***	0.020***
Log Likelihood	-18503.2	-2935.2	-5612.5