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## Effects of Poverty and Family Stress Over Three Decades on Functional Status of Older African American Women

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### Abstract

**Objectives**—The purpose of this study was to investigate the cumulative effects of poverty and family stressors to the later life functional status of African American women.

**Methods**—We used longitudinal data covering a 30-year period for a cohort of 553 African American women with common life experiences. Interviews were conducted with these women as young mothers, as mothers of adolescents, and in early old age (two thirds aged 60+). We classified women as high, usual, or low functioning by using physical and mental health indicators. We examined both timing and duration of poverty and family stressors.

**Results**—Initially these women were largely healthy, but health declines were steeper and occurred earlier for those who were low functioning in later life. Persistent poverty was detrimental to functioning at older ages, as was persistent family stress. Women who left poverty early did not differ in later life functioning from women who were never poor.

**Discussion**—Despite similar earlier life circumstances and health, there was substantial heterogeneity in functioning in early old age. Long-term poverty and family stress were strongly associated with being low functioning. Early poverty and transient family problems did not have lasting health effects, underscoring the plasticity of human development and the importance of interventions that can alter life course trajectories.

### Keywords

Poverty; Functional status; Family stress; African American women

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The relationship of race and socio-economic status (SES) to health disparities and cumulative health disadvantages over the life course has been the focus of a large body of research and several comprehensive reviews (House, 2001; Zarit, Pearlin & Hendricks, 2005). Among older people, being black and being poor are both associated with numerous indicators of poor health, including chronic disease onset (Kington & Smith, 1997) and disability (Schoeni, Martin, Andreski & Freedman, 2005). Disentangling the effects of race and SES on the health of older individuals has proven difficult, however. Some studies suggest that socioeconomic factors

largely account for the health disadvantages of blacks (Hayward, Miles, Crimmins & Yang, 2000). Others find SES explains race differences in some health indicators, but that strong race differences persist for others even when SES is taken into consideration (Kahn & Fazio, 2005).

One avenue of increasing interest for understanding racial health inequalities at older ages is earlier life experience. A life course perspective offers the opportunity to assess the impact in later life of long-term or cumulative negative (or positive) experiences, as well as the timing of key experiences earlier in life (George, 2002). Recent studies (Kahn & Fazio, 2005; O'Rand, 1996) have provided support for the hypothesis that cumulative disadvantages over the life course are important determinants of health at older ages, and contribute to the heterogeneity of health and functioning in older populations. Evidence is growing concerning the biological pathways by which social environment affects health, and in particular the impact of cumulative stress through repeated exposures (Seeman & McEwen, 1996; Seeman, Singer, Ryff, Love & Levy-Storms, 2002; Uchino, Cacioppo & Kiecolt-Glaser, 1996).

Socioeconomic disadvantages are of particular import for health over the life course, though the mechanisms involved are complex. Poverty increases exposure to negative physical, psychological, behavioral and social environments that influence health (Halfon & Hochstein, 2002; Link & Phelan, 2000), limits opportunities for education and achievement (Williams, Jackson & Anderson, 1997), restricts access to adequate health care (Felland, Felt-Lisk & McHugh, 2004; House, 2001; Kasper, 2000), and exposes individuals to numerous stressors that create poor health trajectories over time (Pearlin, Schieman, Fazio & Meersman, 2005). A robust literature suggesting that stressful social and interpersonal relationships affect health at older ages (Cohen & Syme, 1985; Ensminger & Juon, 2001; House 2001; House & Williams, 2000; Turner, Wheaton & Lloyd, 1995) points to the need to examine other sources of stress as well.

Both the persistence and timing of disadvantages over the life course have been hypothesized to influence health in later life. Kahn and Pearlin (2006) found continuous financial hardship across earlier years was more detrimental to health of older individuals than episodic difficulties. Knowledge concerning how the timing of experiences, such as financial stress, over the life course affects late-life health outcomes is limited (Hayward, Miles, Crimmins & Yang, 2000). A recent study of a British birth cohort found early childhood socioeconomic status was associated with functional status in mid-life (Guralnik, Butterworth, Wadsworth & Kuh, 2006). The timing of events may not have uniform effects across population subgroups, however. Another recent study found adverse childhood economic conditions were predictive of heart attack risk as an adult for women, but not for men (Hamil-Lukar & O'Rand, 2007).

There are significant challenges to understanding the causal pathways from earlier socioeconomic experiences to later life health disparities. Some relate to data limitations, including short time frames for observation in many studies (e.g. Hayward, Miles, Crimmins & Yang, 2000, who examined a 2-year interval), and reliance on retrospective reports of earlier life experiences such as financial stress (e.g. Kahn & Pearlin, 2006). Sorting out the effects of socioeconomic status and race on health at older ages is also complicated by findings that suggest possible differences in the impact of SES on health within racial subgroups. Kahn and Fazio (2005) suggest subjective assessments of financial and other hardships may differ by race. Kahn and Pearlin (2006) find the cumulative effects of financial stress were more detrimental to the health of older whites than of older African Americans. McDonough et al. (2005) indicate African Americans who left early poverty were able to close the health gap with African Americans who were never poor, but the same was not true for whites. Even at younger ages the effects of SES on later health may vary by race. Geronimus (1992) proposed that the survival advantage of infants born to African American teen, compared to older,

mothers reflected the more rapid deterioration of health among socioeconomically disadvantaged black women (the “weathering hypothesis”) – a pattern not observed for white mothers.

This study contributes to our understanding of the effects on health in later life of the pattern and timing of earlier economic and family stressors, using a unique longitudinal study of a cohort of African American women. Studies of the effects of SES and other stressors over the life course among black individuals are rare. Examining the dynamics of stressors earlier in life and their effects on later life health among minority women, offers the opportunity to observe these relationships without the confounding influence of race. The women in this study cohort have many life experiences in common – at the study’s start all were mothers of a child in 1<sup>st</sup> grade in the same low income urban neighborhood in a major metropolitan area. Over a 30-year period, they were interviewed at three points, providing current rather than retrospective views of socio-economic and other stressors.

Several related questions are addressed in this analysis: a) how variable is health among these older African American women, who at an earlier stage had a shared neighborhood environment and life experiences in common? b) are patterns of poverty over time associated with late life health? c) what is the impact of poverty and family stressors, cumulatively and at specific points in the life course, on health differences at older ages? d) what is the relative importance of the timing and persistence of poverty and family stressors on later health?

## METHODS

### Study Sample

The women in this study participated as the mothers of a study cohort comprised of all first graders in Woodlawn, a poor African American community on the south side of Chicago (Kellam, Branch, Agrawal & Ensminger, 1979). Only 13 families in the Woodlawn neighborhood chose not to participate. At the study’s initiation, Woodlawn ranked among the five most impoverished neighborhoods in Chicago, with three times as many residents on public assistance per 1,000 population as Chicago as a whole (de Vise, 1967). However, there was socioeconomic diversity in the community with some census tracts having a high percentage of home ownership and a low percentage of poverty.

Participants (all African American) were interviewed three times over 30 years: in 1967, when their children were in first grade (Time 1); in 1976, when their children were adolescents (Time 2); and in 1997, when their children were adults (Time 3). There were 1,140 mothers of 1<sup>st</sup> graders in the original cohort ranging in age from 19 to 51. Eighty-eight percent of the original participants were located in 1997; 25.4% were deceased but 77% of all survivors were interviewed (n=680). Women interviewed at all three times are the focus of this study (n = 553). At the time of the 3<sup>rd</sup> interview, the women ranged in age from 51 to 80 (mean age = 62.2 years). Nearly two-thirds were age 60 or older (63%) and 29% were ages 55 to 60. (See Ensminger & Juon, 2001, for details regarding longitudinal attrition and characteristics of responders and nonresponders).

### Measures of Functional Status at Time 3

There are numerous ways to characterize health and functioning in older people. For this analysis, we followed the approach of Berkman et al. (1993), classifying women as high, usual and low functioning using both mental and physical health indicators. Three measurement constructs were used from the Time 3 interview to assess functioning in later life: one for physical functioning, one for bodily pain, and one for depressed mood.

Physical functioning and bodily pain were taken from the SF-36 (Ware & Sherbourne, 1992), a widely used and well-validated general health status instrument, which was administered in the 3<sup>rd</sup> interview. The physical functioning measure consists of 10 items that ask about activities persons might do during a typical day and whether “your health now limits you in these activities?” (limited a lot; limited a little; not limited at all). The bodily pain measure is based on 2 items: How much bodily pain have you had during the past 4 weeks? (very severe; severe; moderate; mild; very mild; none); During the past 4 weeks, how much did pain interrupt your normal work including both work outside the home and housework? (extremely; quite a bit; moderately; slightly; not at all). Each SF-36 scale ranged from 0 to 100 with higher scores indicating better functioning (for physical functioning, mean=66.8, SD=29.8; for bodily pain, mean=69.7, SD=28.1).

The depressed mood construct was based on the sum of scores from 10 items (coded never; almost never; sometimes; fairly often; often) from the CES-D (Radloff, 1977). Scores ranged from 10 to 46 with higher scores indicating a greater degree of depressed mood (mean=18.3, SD=6.8).

The distribution of scores for women in our study across these three measures was examined in order to partition the sample into women who were high and low functioning across all three. Women with scores in the top 40% on all three measures comprised 20.1% of the sample; women with scores in the bottom 40% on all three comprised 19.8% of the sample. These cut-points provide equivalent size groups of high and low functioning older African American women (n = 104 and n = 109, respectively; the remaining 340 women were classified as usual functioning).

## Independent Variables

**Demographics**—*Education* and *mother’s age at birth of first child (<18 or older)* were obtained at the first interview. Marital status and employment status are characterized at each interview. *Number of children* is lifetime.

**Health conditions and self-rated health**—Measures were obtained at each interview. At Time 3, women were asked about a series of *health conditions* (e.g. has a doctor told you that you have arthritis?). Six conditions are used here: arthritis, diabetes, cancer, hypertension, cardiovascular (heart trouble or heart attack; a blood circulation problem, or “hardening of the arteries”), and asthma or lung disease. *Self-rated health* (excellent, very good, good, fair, poor) was asked at Time 3. At Time 2, women were asked whether in the past 10 years (since the Time 1 interview) they had been “very healthy, moderately healthy, not too healthy or not at all healthy.” A question about feeling sad was asked at both Time 1 and Time 2: “How often do you have days when you are sad and blue – very often, fairly often, occasionally, or hardly ever?” At Time 1, women were asked whether they had an illness or condition that “has lasted a long time or that needs medicine regularly, or that limits activity in any way.” They also were asked about health in pregnancy: “Thinking back to your pregnancy with (child in 1<sup>st</sup> grade), how was your general physical health then – excellent, good, fair or poor?”

**Timing and Duration of Poverty**—Income was obtained at each interview and used to classify women as in *poverty* (100% or below of the federal poverty level based on income and household size at the year of the interview). *Timing of poverty* is indicated by status at the time of each interview. *Duration of poverty* uses information from all interviews to reflect status over time: not poor (not in poverty at any of the 3 interviews), early only (poor at Time 1 and/or Time 2 but not Time 3), late only (poor at Time 3 only), late/episodic (poor at Time 3 and also at Time 1 or Time 2), and persistent (poor at all 3 interviews).

**Family Stress**—Three sources of stress stemming from family problems are examined – drug use, trouble with the law, and high level of household conflict. Questions about these problems were introduced in the Time 2 interview and were asked again at Time 3.

*Drug use* in the past year by household members was asked at Time 2 (any use of several drugs including marijuana, uppers, cocaine, heroin or methadone); the question at Time 3 was “whether there was a problem caused” by using these types of drugs. *Family member in trouble with law/incarcerated* was determined at Time 2 by questions that asked about trouble with the law or incarceration “that happened to you or a member of your household” since the first interview, and at Time 3, that “happened to your family” since the Time 2 interview.

*Family conflict* was based on several items. Scores on items were summed and women with scores in the highest quartile were considered to experience high family conflict. Time 2 items were: have arguments with one another, yell or shout to let off steam, let out hurt and angry feelings, throw things when angry, slam doors when angry. Responses were on a 6-point scale from several times a week to less than every few months (mean=13.3, SD=5.9, range=5–30). At Time 3, two additional items were added (threaten to hit or throw something; kick, hit, or try to hit each other) and item responses were on a 4-point scale from never to often (mean=10.2, SD=3.4, range=7–28).

## Analysis

Analyses of the relationship of characteristics over the life course to functional status of older African American women (high, usual, and low functioning at Time 3) were conducted using multinomial logistic regression (STATA mlogit). A test of the proportional odds assumption (no difference in the coefficients between each pair of outcome groups) indicated ordinal logistic regression was not appropriate. Maximum likelihood estimation was used to calculate logit coefficients (unstandardized logistic regression coefficients) which were then converted to relative risk ratios (the ratios of exponentiated coefficients, commonly interpreted as odds ratios). Ordinal logistic regression was used where the outcome of interest was dichotomous (Table 3). All analyses include age as a control variable.

## RESULTS

### How variable is health in later life among African American women who 30 years earlier had in common residence in the same urban neighborhood and a child in 1<sup>st</sup> grade?

Considerable heterogeneity in health and functional status existed among the African American women in this neighborhood cohort 30 years after their initial study interview. Those who were high functioning at the Time 3 interview were significantly less likely than women in the usual and low functioning groups to report having major chronic conditions, with the exception of cancer (Table 1). Among women classified as low functioning, four out of five reported arthritis and hypertension, half reported cardiovascular disease, and almost a third reported asthma or lung disease. A high percentage – 83.5% – also rated their own health as fair or poor, in contrast to 36.0% of women in the usual functioning group, and 11.7% of women in the high functioning group.

The women in this cohort were largely healthy at Time 1 and Time 2, nevertheless there are connections between their health at earlier points and later life functional status. One-third (33.9%) of women who were low functioning at Time 3 indicated at Time 2 (about twenty years earlier) that they had been “not too” or “not at all” healthy over the previous 10 years. By contrast only 5.8% of women who were high functioning at Time 3 indicated poor health at Time 2. Women who were low functioning at Time 3 also were more likely to indicate earlier in life that they “very often” or “fairly often” had days when they felt sad. Even at Time 1,



differences in reporting a chronic condition were significant across functional status groups at Time 3 (5.8% for high functioning; 10.7% for usual functioning; 11.9% for low functioning), although comparisons between pairs of groups did not reach significance. Comparisons between functional status groups for feeling sad were significant (women who were high functioning later on were significantly less likely to feel sad often, in contrast to both usual and low functioning women). Self-rated fair or poor health in pregnancy (with 1<sup>st</sup> grade child) was not related to functional status 30 years later, although women who were high functioning were less likely than low functioning women to indicate poor health in pregnancy.

### **Are patterns of poverty associated with functional status in later life?**

Overall, this cohort of urban African American women was substantially less well off than other women their age. At Time 3, 80.7% of women who were low functioning had incomes below 100% of the poverty level. Even among high functioning women, over one third were poor. By comparison, only about 13% of all women in the U.S. age 60 and older were poor in 1997 (Dalaker & Naifeh, 1998).

Poverty and poor health at older ages were related as others have found (Table 2). At each point, women who were high functioning at older ages were less likely to be poor than women who were low functioning. High functioning women also were less likely to be poor both initially (Time 1) and in later life (Time 3) than women in the usual functioning group. The proportion of high functioning women who were poor remained at about one-third at each interview, while among usual and low functioning women the proportion in poverty increased over time (from 51.5% at Time 1 to 61.8% at Time 3 for women who were usual functioning; from 57.8% at Time 1 to 80.7% at Time 3 for women who were low functioning).

Patterns of duration of poverty were quite different by functional status at older ages as well. High functioning women in later life were much more likely than others to have never been poor or poor only initially – together accounting for two-thirds of these women; only about 5% were persistently poor over 30 years. By contrast, 39.4% of women who were low functioning at later ages were persistently poor and 26.6% experienced late/episodic (poor at Time 3 and at one other earlier point). Among women who were low functioning, only 9.2% were not poor at any interview over 30 years.

The impact of socioeconomic disadvantage, poverty specifically, on health is a major focus of this analysis, but clearly there are many significant life circumstances closely connected to SES (Pearlin et al., 2005, describe these as the “education-occupation-economic chain”). Table 3 shows marital and employment status, education, number of children, and age at birth of first child, as they relate to poverty at each interview over 30 years. Women who were married at any of the three interviews were at substantially reduced risk of being in poverty at that time (OR = .14 at Time 1; OR=.12 at Time 2; OR = .34 at Time 3). Marriage at earlier points was not related to poverty at Time 3, however. Being employed also reduced the risk of poverty at each interview, and employment at earlier points also was protective against poverty in later life. Marriage appears somewhat more protective against poverty than employment early on, when these women were in their child-bearing years, while the reverse was true in later life.

Education (high school graduate) reduced the risk of being poor at each point over 30 years of follow-up; the odds of being poor was about 70% less for high school graduates, relative to nongraduates. A greater number of children was associated with elevated odds of being poor at every point, but only for women with 5 or more children relative to 1 or 2 (all women had at least 1 child). While becoming a mother before the age of 18 increased the risk of poverty early on, this effect did not last into later life.

Continuous measures of marital status, employment, and schooling over 30 years also were associated with duration of poverty. Each year of school reduced the likelihood of early poverty by 18% (OR=.82), of late poverty by 22% (OR=.78), of late/episodic poverty by 33% (OR=.67), and of persistent poverty by 42% (OR=.58). Each year of marriage and employment also was protective against persistent and late/episodic poverty, although not as dramatically as were added years of schooling. For example, each additional year of marriage reduced the likelihood of persistent poverty (relative to not being poor at any time) by 10% (OR=.90); each added year of employment reduced the odds by 13% (OR=.87); while each added year of schooling reduced the odds by 42%.

### **What is the impact cumulatively, and at specific points in the life course, of poverty and family stressors on functional differences at older ages?**

A life course perspective suggests that both the timing of events and how long certain conditions last can affect later outcomes. Table 4 examines the impact on health at older ages of poverty, and of family stress related to drug problems, trouble with the law, and high household conflict, at specific points in time and over an extended period.

Poverty was highly prevalent in this cohort of women at each interview (49.4% at Time 1; 60.4% at Time 3). Overall, about a quarter of these women experienced persistent poverty; about one-fifth were never poor. Poverty at any of the three time points – when these women were mothers of a first grade child (Time 1), an adolescent (Time 2), and in later life (Time 3) – significantly reduced the odds of being in the high functioning as opposed to the low functioning group at Time 3. The effect was strongest at Time 3 (OR = .17).

With regard to duration, persistent poverty over 30 years was highly detrimental to functional status at older ages. Women experiencing persistent poverty were 93% less likely to be high versus low functioning in later life relative to women who were never poor (OR = .07), 80% less likely to be high versus usual functioning (OR = .20), and 66% less likely to be usual versus low functioning (OR = .34). Women who were poor at Time 3 and had been poor at one earlier point (late/episodic) also were less likely to be high or usual functioning as opposed to low. Interestingly, women who were only poor early on – at the initial interview or 10 years later – were not at increased risk of low functioning in later life relative to women who were not poor at any time. Women who were poor in late life only were at marginally greater risk of low vs. high functioning.

Both family drug problems and trouble with the law, were more prevalent at Time 3 than Time 2. Since these items reflect experiences of all household members, the higher prevalence of these problems at Time 3 may be because the “children” were young adults at this time. Household conflict was at similar levels at the two time points. Almost a quarter of these women reported one or more types of family stress at both Time 2 and Time 3; 34.8% reported none at both interviews. Despite relatively high prevalence, point-in-time family stress was not related to functional status with one exception – drug problems at Time 3 decreased the likelihood of high or usual as opposed to low functioning. Women who experienced persistent family stress (any of these difficulties at both Time 2 and Time 3), however, were 68% less likely to be high as opposed to low functioning (OR = .32) compared to women with none of these sources of stress at either time.

### **What is the relative importance of the timing and persistence of poverty and family stressors on later functional status?**

Table 5 shows the results of the multivariate analyses that took into account age, earlier health, earlier poverty, and family stressors. The relationship of poverty at Time 3 to functional status at Time 3 remained relatively unchanged when taking into account these variables. Women

who were poor were 83% less likely to be high as opposed to low functioning (OR = .17), and 53% less likely to be high as opposed to usual functioning (OR = .47). While poverty at Time 1 was associated with usual as opposed to high functioning at Time 3, for the most part poverty at earlier time points was not related to differences in functional status at Time 3, taking into account poverty at Time 3 and other variables. Both drug problems and high household conflict at Time 3 were marginally associated with reduced odds of being high as opposed to low functioning, controlling for other factors. Drug problems reduced likelihood of usual versus low functioning; women reporting high household conflict were less likely to be in the high as opposed to usual functioning groups.

Both persistent poverty and persistent family stress were significant predictors of functional status at Time 3 in a model controlling for age and earlier health. Women who were persistently poor, or experienced late/episodic poverty, were much less likely to be high as opposed to low functioning than women who were not poor at any time (OR = .08 and .24, respectively). Persistent poverty increased the odds of worse health status for every comparison (high vs. usual, high vs. low, usual vs. low). Women who experienced persistent family stress (at both Times 2 and 3) were 60% less likely to be high as opposed to low functioning, taking into account age, earlier health, and duration of poverty, than women who did not experience problems in their household with drugs or the law, or high household conflict.

## DISCUSSION

Earlier life events including poor health, financial disadvantage, and harmful health behaviors intertwine in complex ways to influence health at older ages. This study represents a unique opportunity to investigate the impact of economic and family stress on later life health disparities in a cohort of African American women with shared early life circumstances. Furthermore, because interview data were obtained at three points over a 30-year time span, it is possible to examine both the timing and duration of economic and family stress, adding to our understanding of the importance of persistent versus transient stress.

Although the women in this cohort were largely healthy at the outset of this study, 30 years later as they entered older ages (two-thirds were 60 or older at the Time 3 interview), there was substantial heterogeneity. Some were in very good health -- 27% of the cohort had scores of 90 to 100 on the SF-36 Physical Functioning subscale for example; others were in poor health. The trajectories for high and low functioning women are instructive. For women who were low functioning in later life, the proportion indicating poor health climbed steadily over the 30 year study period -- from 11.9% with a chronic health condition at Time 1, to 33.9% who were unhealthy at Time 2, to 83.5% in fair or poor health at Time 3. By contrast, the proportion of high functioning women indicating poor health on these measures remained unchanged (at 5.8%) from Time 1 to Time 2, increasing to only 11.7% in fair or poor health at Time 3. This pattern suggests that for women who were low functioning in later life, health declines began much earlier, and accumulated over time. Despite commonalities with regard to race and residence, there were distinct health trajectories in this cohort of women over the 30-year period spanning young adulthood to early old age.

Poverty was highly prevalent in this study cohort. Education, marriage and employment were key links to the economic advantages/disadvantages experienced by these women during their adult years. Education, employment and marriage all were protective against poverty at given points. However, each additional year of education had a stronger protective effect against poverty, than did each year of marriage or employment. Most dramatically, each added year of schooling conveyed a 42% reduction in the odds of being persistently poor (relative to never poor). Whether these women avoided poverty, left it early, or experienced persistent poverty was closely tied to contingencies in their wider social environment.



Poverty at each time point was related to functional status at later ages, but there appear to be important underlying patterns that point-in-time measures do not reveal. Poverty at Time 3 overrides the effects of poverty at earlier time points on later life health, when they are considered together. Other studies also typically find that more recent economic difficulties have a greater health impact than more distant ones (House & Williams, 2000; Kahn & Pearlin, 2006). However, in this subgroup of African American women, at least one-third of whom were poor at any of three points over 30 years, those who were always poor and those who were poor in later life and had experienced poverty earlier, were in decidedly worse health in later life, than their counterparts. These findings are consistent with findings from studies of very different population subgroups findings (Kahn & Fazio, 2005; McDonough, Sacker & Wiggins, 2005) and support the hypothesis that chronic stress associated with cumulative economic disadvantage is a major contributor to poor health at older ages.

Also of interest is that women who were poor only in early to mid-adulthood were no worse off in terms of later life functional status than those who were never poor. A finding that early poverty – if it does not recur or persist – may not have lasting effects on health, underlines the plasticity of human development and reinforces the value of interventions that can alter life course trajectories. Intriguingly, McDonough et al. (2005) found in their study of patterns of poverty that among African Americans who left poverty (as well as younger and better educated people) were able to close the health gap with their counterparts who were never poor.

The concept of stress proliferation (Kahn & Pearlin, 2006; Pearlin, Schieman, Fazio & Meersman, 2005) posits that stress in certain domains, such as economic well-being, leads to other strains that escalate the health-damaging impact of stress. Experiencing chronic stress of one kind (economic) was associated with another form of chronic stress (family) in this cohort of African American women. Persistent poverty and persistent family stress were significantly correlated ( $r = .16, p < .001$ ) in this study cohort. In addition, at Time 3, poverty was associated with family drug problems ( $r = .08, p < .05$ ) and trouble with the law ( $r = .15, p < .001$ ) (but not high household conflict). Unlike poverty, most types of family stress at given points were not related to later life functional status. Persistent family stress, however, reduced the odds of high functional status (vs. low) even when duration of poverty was considered. The pernicious effects of multiple types of chronic long-term stress on health at older ages seem supported by these findings.

A major strength of this study is that information on poverty, health, and family stressors such as household conflict, comes from three interviews conducted over a 30 year period, as opposed to retrospective recollection of events. Nonetheless, there are several important limitations. One has to do with changes over time in the information obtained. Questions about family stressors for example were modified between the Time 2 and Time 3 interviews, so that although the variables are comparable, they are not identical. In addition, while the 30-year time span covers a major segment of adult life for these women, only three time points are sampled across this period. Measures of duration of poverty and family stress based on these may miss important changes in the intervals between interviews. Poverty at all three points is considered “persistent,” for example, but it is possible that additional income fluctuations occurred that are not captured. Nonetheless, women who were poor at all 3 points are likely to have been in poverty for substantial periods over this time frame. Finally, the study sample consists only of African American women from a single urban area, limiting the generalizability of the findings to other population subgroups.

The strong effects of long-term poverty and family stress on health at older ages in a cohort of African American women residing in a low income urban neighborhood is further evidence of the strength of the connection between social determinants and health. Health gradients have been tied to socioeconomic status in the population at large (Minkler, Fuller-Thomson &

Guralnik, 2006) and among white collar workers (Marmot et al., 1991). This study provides evidence of a similar gradient in a minority cohort of women in an economically disadvantaged environment. Of key importance to health in later life, however, was the persistence over the life course of the economic disadvantage and family stressors these women encountered. Those who escaped early poverty or experienced difficult family events that did not last, appear to have eluded the negative health trajectories observed in women experiencing persistent stress. Reducing health disparities at older ages must take into account earlier life experiences. Even among individuals who face many disadvantages earlier in life, however, intervening to break patterns of persistent disadvantage and stress may yield health benefits many years later.

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**Table 1**

Relationship of Individual Health Indicators Over a 30-year Period to Functional Status of Older African American Women<sup>a,b</sup>

Health Indicators (Time 3)	Functional status at Time 3:			Chi square	Functional status comparisons <sup>c</sup>	
	High (H) N=104 (18.8%)	Usual (U) N=340 (61.5%)	Low (L) N=109 (19.7%)		Unadjusted	Age adjusted
Arthritis	30.1%	57.2%	84.4%	***	H<U <sup>***</sup> U<L <sup>***</sup> H<L <sup>***</sup>	H<U <sup>***</sup> U<L <sup>***</sup> H<L <sup>***</sup>
Diabetes	14.6%	21.8%	37.6%	***	H<U U<L <sup>***</sup> H<L <sup>***</sup>	H<U U<L <sup>***</sup> H<L <sup>***</sup>
Cancer	6.9%	5.9%	9.3%	ns	H<U U<L H<L	H<U U<L H<L
Hypertension	46.6%	63.4%	81.7%	***	H<U <sup>***</sup> U<L <sup>***</sup> H<L <sup>***</sup>	H<U <sup>**</sup> U<L <sup>***</sup> H<L <sup>***</sup>
Cardiovascular disease <sup>c</sup>	8.7%	26.0%	51.4%	***	H<U <sup>***</sup> U<L <sup>***</sup> H<L <sup>***</sup>	H<U <sup>***</sup> U<L <sup>***</sup> H<L <sup>***</sup>
Asthma or Lung Disease <sup>d</sup>	6.8%	15.9%	28.4%	***	H<U <sup>*</sup> U<L <sup>**</sup> H<L <sup>***</sup>	H<U <sup>*</sup> U<L <sup>**</sup> H<L <sup>***</sup>

	Functional status at Time 3:			Functional status comparisons <sup>c</sup>		
	High (H) N=104 (18.8%)	Usual (U) N=340 (61.5%)	Low (L) N=109 (19.7%)	Chi square	Unadjusted	Age adjusted
Poor/fair health self-rated	11.7%	36.0%	83.5%	***	H<U <sup>***</sup> U<L <sup>***</sup> H<L <sup>***</sup>	H<U <sup>***</sup> U<L <sup>***</sup> H<L <sup>***</sup>
<u>Health Indicators (Time 2)</u>						
Not healthy <sup>e</sup>	5.8%	19.2%	33.9%	***	H<U <sup>**</sup> U<L <sup>***</sup> H<L <sup>***</sup>	H<U <sup>**</sup> U<L <sup>***</sup> H<L <sup>***</sup>
Sad (very often, fairly often)	5.8%	17.1%	25.7%	***	H<U <sup>*</sup> U<L <sup>***</sup> H<L <sup>***</sup>	H<U <sup>*</sup> U<L <sup>***</sup> H<L <sup>**</sup>
<u>Health Indicators (Time 1)</u>						
Has chronic health condition <sup>f</sup>	5.8%	10.7%	11.9%	*	H<U U<L H<L	H<U U<L H<L
Sad (very often, fairly often)	1.9%	10.9%	12.8%	*	H<U <sup>**</sup> U<L <sup>*</sup> H<L <sup>***</sup>	H<U <sup>**</sup> U<L <sup>*</sup> H<L <sup>***</sup>
Health in pregnancy (poor or fair)	16.7%	22.0%	29.5%	ns	H<U U<L H<L <sup>*</sup>	H<U U<L H<L <sup>*</sup>

<sup>a</sup>For all tables: High functioning = in the highest 40% on 3 scales for bodily pain, physical functioning, and depressed mood; Low functioning = in the lowest 40% on 3 scales for bodily pain, physical functioning, and depressed mood; Usual functioning = all other score combinations



- <sup>b</sup>Data were collected at 3 time periods: Time 1=1966–67; Time 2=1976–77; Time 3=1997–98
- <sup>c</sup>Based on multinomial logistic regression
- <sup>d</sup>Cardiovascular disease comprises stroke, circulation problem ('hardening of the arteries'), heart 'trouble' or heart attack
- <sup>e</sup>Asthma or lung disease comprises asthma, other respiratory diseases, tuberculosis, or lung diseases (emphysema, chronic bronchitis)
- <sup>f</sup>How healthy would you say you've been since Time 1 (1=very, 2=moderately, 3=not too, 4=not at all); not healthy = not too or not at all
- <sup>g</sup>Illness or condition that has lasted a long time or that needs medicine regularly, or that limits activity in any way (yes/no)
- \*  $p \leq 0.05$ ;
- \*\*  $p \leq 0.01$ ;
- \*\*\*  $p \leq 0.001$  in chi square analysis or oneway analysis of variance (Tukey's HSD); ns=not significant

**Table 2**

Functional Status of Older African American Women by Timing and Duration of Poverty over a 30-year Period

	Functional status at Time 3:			Chi square
	High (H)	Usual (U)	Low (L)	
Poverty <sup>a</sup> at:				
Time 1 (1966–67)	35.6%	61.8%	80.7%	***
Time 2 (1976–77)	34.6%	45.3%	58.7%	**
Time 3 (1997–98)	33.7%	51.5%	57.8%	***
Duration of Poverty <sup>b</sup> :				
Not poor	30.8%	19.5%	9.2%	
Early only	33.7	18.6	10.1	
Late only	16.3	18.9	14.7	***
Late/episodic	14.4	17.2	26.6	
Persistent	4.8	25.7	39.4	

<sup>a</sup> <100% of the federal poverty level (income adjusted for household size)

<sup>b</sup> For all tables: Not poor at T1, T2, or T3; Early poverty only = Poor at T1 and/or T2 but not T3; Late poverty only = Poor at T3 only; Late/episodic poverty = Poor at T3 and also at T1 or T2; Persistent poverty = Poor at T1, T2, and T3

\*  $p \leq 0.05$ ;

\*\*  $p \leq 0.01$ ;

\*\*\*  $p \leq 0.001$  in chi square analysis or one way analysis of variance (Tukey's HSD); ns=not significant

**Table 3**

## Demographic Correlates of Timing and Duration of Poverty Over a 30-year Period

	Odds of Being in Poverty at: <sup>a</sup>		
	Time 1 (1966–67)	Time 2 (1976–77)	Time 3 (1997–98)
Married Time 1	0.14***	0.32***	0.93
Married Time 2	--	0.12***	0.81
Married Time 3	--	--	0.34***
Employed Time 1	0.47***	0.39***	0.49***
Employed Time 2	--	0.29***	0.24***
Employed Time 3	--	--	0.08***
High school graduate	0.33***	0.32***	0.30***
Number of children <sup>b</sup>			
3–4 children	1.02	1.27	0.98
5–6 children	1.75	3.32***	2.41**
7+ children	5.03***	6.26***	2.91***
1 <sup>st</sup> child delivered < age 18	1.66*	1.73**	0.95

  

	Odds of Poverty (Relative to Not Poor at any time) <sup>c</sup>			
	Early poverty only	Late poverty only	Late/episodic poverty	Persistent poverty
Married (in years)	0.96***	1.00	0.94***	0.90***
Employed (in years)	0.97	0.92***	0.91***	0.87***
Schooling (in years)	0.82**	0.78***	0.67***	0.58***

<sup>a</sup> odds ratio from logistic regression (0=not poor, 1=poor)

<sup>b</sup> reference category = 1–2 children

<sup>c</sup> maximum-likelihood multinomial logistic regression; Not poor at Time 1, 2 or 3 = ref. category

\* p<0.05;

\*\* p<0.01;

\*\*\* p<0.001

Table 4

Timing and Duration of Poverty and Family Stress Over a 30-year Period as Predictors of Functional Status in Older African American Women: Odds Ratios from Maximum Likelihood Multinomial Logistic Regression

	% (N=553)	Odds of Functional Status at Time 3:		
		High vs Usual	High vs Low	Usual vs Low
Poverty at Time 1 <sup>a</sup>	49.4 (273)	0.53**	0.42**	0.80
Poverty at Time 2 <sup>b</sup>	45.9 (254)	0.77	0.52*	0.67 <sup>^</sup>
Poverty at Time 3 <sup>c</sup>	60.4 (334)	0.45**	0.17***	0.37***
Duration of Poverty <sup>c</sup>				
Not poor	19.6 (108)	ref	ref	ref
Early only	19.8 (109)	1.37	1.32	0.96
Late only	17.6 (97)	0.69	0.37 <sup>^</sup>	0.54
Late/episodic	18.5 (102)	0.72	0.21**	0.30**
Persistent	24.5 (135)	0.20**	0.07***	0.34**
Family stress at Time 2 <sup>c</sup>				
Drug problems	8.7 (48)	0.60	0.41	0.68
Trouble w/law	13.7 (76)	1.32	1.06	0.80
Household conflict (High)	26.4 (146)	0.91	0.77	0.84
Family stress at Time 3 <sup>c</sup>				
Drug problems	21.5 (119)	1.02	0.42*	0.41**
Trouble w/law	32.4 (179)	0.74	0.79	1.05
Household conflict (High)	21.5 (119)	0.54 <sup>^</sup>	0.54	1.00
Duration of family stress <sup>c,d</sup>				
Not at Time 2 or Time 3	34.8 (192)	ref	ref	ref
Time 2 only	14.5 (80)	.54 <sup>^</sup>	.50	.92
Time 3 only	26.5 (146)	.56 <sup>^</sup>	.47 <sup>^</sup>	.84

Time 2 & Time 3	% (N=553)	Odds of Functional Status at Time 3:		
		High vs Usual	High vs Low	Usual vs Low
	24.1 (133)	.58 <sup>^</sup>	.32 <sup>**</sup>	.56 <sup>^</sup>

<sup>a</sup> Adjusted for age and health at Time 1: Chronic condition (yes/no); feeling sad fairly or very often (yes/no)

<sup>b</sup> Adjusted for age and health at Time 2: Feeling not very or not at all healthy (yes/no); feeling sad fairly or very often (yes/no)

<sup>c</sup> Adjusted for age and health at Time 1 and Time 2

<sup>d</sup> Drug problems, trouble with the law, or high household conflict.

Note: 2 women missing on Time 3 poverty also were missing for Duration of Poverty; 2 women missing on all Family Stress measures were missing on Duration of Family Stress.

<sup>^</sup>  $p < 0.10$ ;

\*  $p < 0.05$ ;

\*\*  $p < 0.01$ ;

\*\*\*  $p < 0.001$



**Table 5**

Combined Effects of Poverty and Other Family Stressors by Timing and Duration on Functional Status of Older African American Women: Odds Ratios From Maximum Likelihood Multinomial Logistic Regression

	Odds of Functional Status at Time 3:		
	High vs Usual	High vs Low	Usual vs Low
<u>Timing of Poverty and Family Stress<sup>a</sup></u>			
Poverty at: T1	.54*	.56	1.05
Poverty at T2	1.33	1.11	.84
Poverty at T3	.47**	.17***	.36***
Family stress at T2			
Drug problems	.57	.42	.74
Trouble w/law	1.72	1.20	.70
Household conflict (high)	.88	.81	.92
Family stress at T3			
Drug problems	1.16	.44 <sup>^</sup>	.38**
Trouble w/law	.79	1.01	1.28
Household conflict (high)	.46*	.49 <sup>^</sup>	1.07
<u>Duration of Poverty and Family Stress<sup>a</sup></u>			
Duration of Poverty:			
Not Poor	ref	ref	ref
Early only	1.43	1.40	.98
Late only	.73	.41 <sup>^</sup>	.56
Late/episodic	.75	.24**	.32**
Persistent	.21**	.08***	.36*
Duration of Family Stress			
No family stressors	ref	ref	ref
Time 2 only	.54	.47	.86
Time 3 only	.60 <sup>^</sup>	.55	.92
Persistent family stressors	.64	.40*	.63

<sup>a</sup>Model included age, health at Time 1 (chronic condition (yes/no); feeling sad fairly or very often (yes/no) in 1966), and health at Time 2 (feeling not very or not at all healthy (yes/no); feeling sad fairly or very often (yes/no) in 1976)

<sup>^</sup>  
 $p < 0.10$ ;

\*  
 $p < 0.05$ ;

\*\*  
 $p < 0.01$ ;

\*\*\*  
 $p < 0.001$