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The Relationships between Mothers' Work Pathways and Physical and Mental Health*

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Abstract

We contribute to research on the relationships between gender, work and health by using longitudinal, theoretically driven models of mothers' diverse work pathways and adjusting for unequal selection into these pathways. Using the NLSY79 (N=2,540), we find full-time, continuous employment following a first birth is associated with significantly better health at age forty than part-time work, paid work interrupted by unemployment, and unpaid work in the home. Part-time workers with little unemployment report significantly better health at age forty than mothers experiencing persistent unemployment. These relationships remain after accounting for the unequal selection of more advantaged mothers into full-time, continuous employment, suggesting full-time workers benefit from cumulating advantages across the life course and reiterating the need to disentangle health benefits associated with work from those associated with pre-pregnancy characteristics.

Keywords

health; mental health; work; motherhood; gender

At the start of the twenty-first century, 78 percent of mothers with children under the age of 18 were employed (Bianchi et al 2006). Paid work benefits women's health by providing access to financial security, health insurance, social networks, and self-worth (Pavalko & Smith 1999; Schnittker 2007; Ross & Wu 1995). Yet mothers are more likely to have workforce gaps than their childless peers (Spain & Bianchi 1996), and variables that structure the health benefits of women's employment—such as marital status, socioeconomic status, occupation, and caregiving responsibilities (Kleiner & Pavalko 2010; Pavalko & Woodbury 2000)—also influence women's likelihood to remain employed after becoming a parent.

In this study, we draw from a gendered life course perspective (Moen 2001) to develop theoretical and empirical models of the interactions between women's work and health

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following the transition to motherhood. The life course perspective posits that neither health nor employment is static as individuals age; instead, these forces unfold interdependently over time as individuals exercise agency within the constraints of the social environment (Elder, Johnson, & Crosnoe 2003). Moreover, advantages or disadvantages early in life—such as economic adversity, educational attainment, single parenthood, or age at first birth—cumulate over the life course with a “systematic tendency” to generate intracohort disparities in health, work, and income (Dannefer 2003: 327; O’Rand 2006; Wilson et al. 2007). We evaluate the roles of these cumulating forces in shaping the relationships between work pathways and health by analyzing the processes that shape women’s work pathways prior to motherhood, as well as the resulting relationships between work and health during middle age. In doing so, we investigate the mutually reinforcing relationships between early advantages/disadvantages, workforce participation, resources associated with paid work, and health at age 40.

Despite the wealth of research supporting the positive relationships between women’s work and health, there remains a limited understanding of how work pathways develop over the life course and how these pathways influence health. First, previous studies have relied on repeated cross-sections of data, or on longitudinal data that spans only a brief period of women’s working lives, even though work and caregiving roles vary over time (Moen & Chermack 2005; Pavalko and Woodbury 2000). Second, relatively little research has focused specifically on the relationships between work and health among mothers, although motherhood often disrupts women’s workforce participation (Spain & Bianchi 1996). Third, prior studies generally have not accounted for unequal selection into work pathways, yet mothers’ pre- and at-birth characteristics select them into pathways of work, and these variables are also associated with health. Addressing these gaps will provide a better understanding of the relationships between women’s work and health at middle-age, as well as a more robust theoretical frame that takes into consideration how gender and cumulative disadvantages shape work across the life-course and how work, in turn, shapes women’s health.

We draw on recent qualitative research to develop theoretically and empirically informed categories of mothers’ longitudinal work pathways that better reflect mothers’ employment patterns at the turn of the 21st century. Using The National Longitudinal Study of Youth – 1979 (NLSY79), we investigate the following research questions: what social processes at or prior to a first birth select women into work pathways following the transition to motherhood? Net of characteristics that select women into work, what are the relationships between mothers’ work pathways following a first birth and mental and physical health during middle age? Finally, through which mechanisms do work pathways influence health at middle age?

A LIFE COURSE PERSPECTIVE: MOTHERS’ EMPLOYMENT AND HEALTH

Understanding the relationships between mothers’ work pathways and health as mothers enter middle age is essential because it is at this life course stage that long-term, chronic health problems begin to emerge (Read & Gorman 2009). Relative to male peers, women’s health risks include a greater incidence of chronic illness, higher levels of depression, and

earlier onset of disability (Denton et al. 2004; Read and Gorman 2009). Gendered patterns of workforce participation and family formation structure the pacing of mother's lives— influencing transitions around education, parenthood, and work (Moen 2001; Moen & Chermack 2005). Yet differences between women in their rates and timing of these transitions suggests that cumulative advantages/disadvantages may play a role in these relationships, and may restrict some women's access to stable, full-time work.

For women, the positive relationship between paid work and health persists across race, marital status, and life course stage, and is strongest among full-time working women, who report a lower increase in physical limitations relative to their unemployed or intermittently employed peers (Pavalko & Smith 1999; Ross & Mirowsky 1995). Full-time work, especially skilled work, is associated with higher levels of self-esteem, self-efficacy, and personal control, and provides individuals with greater economic security – and better health – relative to the non-employed or underemployed (Link, Lennon, & Dohrenwend 1993; Ross & Mirowsky 1995). But the transition to parenthood often restricts mothers' agency to engage in full-time work, as mothers' dual responsibilities to work and the home lead them to accumulate fewer years of experience, lower wages, and less prestigious work than men and non-mothers (Stone 2007; Budig & England 2001).

Yet few studies have considered the health benefits of mothers' workforce pathways over time, particularly part-time work or work that is interrupted by unemployment—defined here as involuntary time spent out of work while searching for work. Part-time work is unlikely to provide the same benefits as full-time work. Mothers engaged in part-time work may experience distinct health risks, with non-standard work hours, greater job strain, and less access to health insurance, which may lead to lower self-rated health (Kim et al. 2008; Broom et al 2006). But it is unclear whether it is part-time work or individuals' characteristics that contribute most to this relationship. Although women employed in part-time work report poorer health than full-time workers, much of this difference may be attributable to individual, family and job characteristics, including spousal employment, occupational sector, job satisfaction and job tenure (Kleiner & Pavalko 2010).

The association between unemployment and poor health has been under-explored for women. Few studies use longitudinal or nationally representative data to investigate long-term relationships between unemployment and women's well-being. Moreover, it is not clear whether women who face repeated bouts of unemployment are disadvantaged compared to part-time working women. It may be that repeated bouts of unemployment, much like part-time work, may place workers in a precarious work environment and place a strain on health (e.g. Dooley, Prause & Ham-Rowbottom 2000).

Women who do not participate in paid labor report lower levels of physical and mental health (Ross & Mirowsky 1995), and stay-at-home mothers face the double burden of caregiving and household labor, each of which are negatively associated with health (Bird & Ross 1993; Pavalko and Woodbury 2000). For these mothers, it is unclear whether their lack of participation in paid employment, or characteristics of the mothers themselves, or both, that are the strongest predictors of the relationships between work pathways and health at middle age.

Longitudinal Work Pathways

In recent years, there has been an increasing realization that gendered work differences produce patterns of dissimilarities across adult lives (Moen & Chermack 2005: 99), which may not be captured in existing studies. Cross-sectional studies give us a snapshot of women's employment, which could be misleading. If a woman reports that she is currently "out of the labor force," she could simply be taking a year's leave before returning to full-time employment, out of the labor force for only a few years, or out of the labor force for the foreseeable future. Each of these pathways could have different implications for her health. Moreover, looking longitudinally allows us to distinguish between mothers experiencing a single bout of unemployment from those experiencing chronic unemployment.

Variation in mothers' work pathways necessitates a careful look at the relationships between the ways that mothers participate in the paid workforce and mental and physical health. Previously, women's work pathways have been conceived as "working," "intermittently working," or "not working" (see Pavalko & Smith 1999). Tracing women's work pathways longitudinally through analysis of qualitative interview data from 80 randomly sampled women, Damaske (2011) argues that the commonly used "intermittently working" category includes two distinct types of workers: part-time workers and full-time workers who experience multiple bouts of unemployment. Since there has been very limited research on the effects of unemployment on women's health and since prior research suggests that part-time work might be beneficial to women's health under some circumstances (Kleiner & Pavalko 2010), differentiating between these two patterns may provide a better understanding of when work may benefit women's health and under what circumstances.

Using qualitative categories and frameworks in quantitative analysis has a long sociological tradition (Powell et al. 2010; Pescosolido et al. 1998), as qualitative research increases confidence in the validity of theoretical categories (Sieber 1973). Qualitative research allows for a consideration of the "predominant themes" that people use to describe their own lives, and may be better suited to develop "process-oriented models" that can capture the dynamism of life course trajectories (Powell et al. 2010: 46; Pescosolido et al. 1998: 275). Since limited research exists on the relationships between women's work pathways and women's health, using empirical findings from a qualitative study to define work pathways allows us to build upon an existing framework for our study. Therefore, we draw from qualitative longitudinal work pathways to compare mothers' health during middle age.

Following Damaske's (2011) terminology, the first category, *the steady workers*, includes mothers who work full-time steadily across their adult lives, with few, if any, breaks of employment, save for maternity leaves. The second category, *the pulled back workers*, includes mothers who "pull back" from the opportunity to engage in full-time work after the birth of a child and are employed part-time. The third category, *the stay-at-home mothers*, includes all mothers who do not work after the birth of a child. The final category, *the interrupted workers*, experience a higher prevalence of unemployment, as they search for good work but cannot find it, leaving the workforce repeatedly when they find themselves in bad jobs and returning multiple times in the hope of better work.

We use these categories and draw from the life course concept of cumulative advantages/disadvantages to test the hypothesis that more advantaged women – women with higher socioeconomic status pre-birth, more pre-pregnancy education and work experience, and greater cognitive abilities –will be most likely to participate in steady work after the birth of their first child (Hypothesis 1a), and that less advantaged women will be more likely to follow stay-at-home or interrupted work pathways (Hypothesis 1b), as women of color and working-class women are more likely to report workforce gaps than their peers (Alon and Haberfeld 2007). After accounting for selection into work pathways, we anticipate that the cumulative advantages associated with steady work will positively influence health at age 40 net of the factors selecting women into work pathways (Hypothesis 2a), and that the cumulative benefits of steady work by age forty will be attributable to mechanisms associated with steady work, including greater net worth, a greater likelihood to be married, and a greater likelihood to report salaried work (Hypothesis 2b).

Finally, we compare mothers' health at age forty across steady, pulled-back, interrupted, and stay-at-home work pathways. The sizable body of research documenting positive relationships between women's work and health (e.g. Schnittker 2007; Ross & Mirowsky 1995) suggests that long-term, full-time steady employment brings the greatest health benefits to women. Prior research suggests that part-time employment may also be protective of women's health despite its greater instability (Kleiner and Pavalko 2010), therefore we expect mothers who have pulled back from work will report worse health than steady workers, but better health than other mothers (Hypothesis 3a). We anticipate that repeated bouts of unemployment will strain health (see Dooley, Prause & Ham-Rowbottom 2000), and although the paucity of research on women's unemployment makes this variation harder to predict, we hypothesize that interrupted workers will have worse health than their steady and pulled-back peers, but better health than stay-at-home mothers (Hypothesis 3b). Finally, not working for pay is stressful for physical and mental health (Pavalko and Woodbury 2000), suggesting that stay-at-home mothers will report the worst health (Hypothesis 3c).

DATA, SAMPLE, AND MEASURES

Data and Sample Characteristics

The NLSY79 is a longitudinal, nationally representative study of 12,686 men and women aged 14-22 in 1979. These data include extensive measures of employment, marital history, and childbearing for surveyed women at each wave beginning in 1979, and we draw from all available waves of data from 1979 to 2006 for our analyses (survey is ongoing). We first limit our sample to the 2,999 female respondents who were not a part of oversamples and who became mothers between 1978 (the first year for which we have work histories) and 1995, so that we can observe women's workforce participation for a minimum of twelve years between the first birth and the age forty health modules conducted between 1998-2006. This sample restriction excludes only 10% of all first births, but does prevent us from evaluating the relationships between employment and health among the oldest mothers in the sample. Women who delay motherhood for career or education opportunities (Mirowsky 2002) are more likely to be steady workers and may be more economically

advantaged and healthier than other women in our sample. As a result our models may underestimate any health advantages of steady work. Second, we exclude 70 women who report a first birth, but do not live with the child. Third, we exclude 371 women who attrited after reporting a first birth, but prior to age 40, as they were not administered the age-40 health module. Fourth, we exclude 18 women with item nonresponse on one or both of our dependent variables. We impute other missing data using *ice* in Stata 10. Respondents lost to attrition did not vary in average age at first birth, percent single mothers, race-ethnic composition, and percent with health conditions that limit work prior to pregnancy. Our final analytical sample consists of 2,540 mothers.

Selection

We use multinomial treatment models (Deb & Trivedi 2006) to account for the selection of women into workforce pathways. Multinomial treatment models employ a two-stage modeling strategy in order to more accurately isolate the causal relationships between work pathways and mothers' health at middle age. These models first adjust for the nonrandom selection of women into pathways of work based on observed characteristics measured at and prior to the first birth (see Measures for greater detail). Following this, a second stage equation evaluates the relationships between work pathways and health, adjusting for the unequal selection into work pathways (Deb & Trivedi 2006). Accounting for women's selection into workforce pathways will establish the pre-birth factors that are the strongest predictors of women's subsequent pathways of work, and will allow us to consider how work-related advantages/disadvantages accumulate over time by structuring access to steady work.

We use multinomial treatment models to predict mothers' likelihood of entering an "interrupted," "pulled back," or "stay-at-home" pathway relative to entering directly into steady work following the birth of the first child. Deb & Trivedi (2006: 247) provide the basic model:

$$Pr(d_i | z_i, l_i) = \frac{\exp(z' \alpha_j + \delta_j l_{ij})}{1 + \sum_{k=1}^J \exp(z' \alpha_k + \delta_k l_{ik})}$$

Variables z_i , listed in Table 1, are pre- or at-birth predictors of women's workforce pathways and are entered into this first-stage selection equation. This equation produces variables λ_j , which are added to the second-stage regression to adjust for mother's likelihood to enter into pulled back (λ_1), interrupted (λ_2), or stay-at-home work pathways (λ_3) based on observed pre or at-birth characteristics. Table 1 provides greater detail regarding these variables, including means and standard deviations for dependent variables Y_i , independent variables x_i and selection variables z_i .

Measures

Dependent Variables

SF-12, Physical health and Mental health components: Surveyed women were asked a series of questions assessing mental and physical health as they turned 40 between

1998-2006. We derive our outcome variables assessing overall mental and physical health from the SF-12 (Short-Form twelve question), a widely used and clinically validated self-report survey instrument based on the longer SF-36 (Brazier et al. 1992). The SF-12 provides two outcome variables: a continuously measured mental health percentile and a continuously measured physical health percentile for each respondent. Scores range from 0.00-100.00, with scores higher than 50 indicating that a respondent's mental or physical health is above average relative to a typical US adult. We also run supplemental models (not shown) using frequency of depressive symptoms (CES-D score) and self-rated health as outcomes and results were similar.

Independent Variables – Women's work pathways: Our four mutually exclusive and exhaustive work pathways distinguish steadily working women, women who pulled back from full-time work following the first birth, women with repeated bouts of unemployment while attempting to work full-time—interrupted work careers—and stay-at-home mothers who did not work for pay and did not seek work. Each mother is assigned to a single work pathway based on her total bouts of unemployment, average hours worked during employed weeks, and timing of labor re-entry between the first child's 1st and 12th birthdays. We begin tracking mothers' work about 18-24 months following the first birth to ensure that our results are not biased by maternity leave or health problems following the first birth. We code these categories using annual (and after 1994, biennial) reports of women's labor market activities in the NLSY79, which document the number of weeks worked per year in the last year, the number of hours worked in the last year, and the number of weeks spent in unemployment (actively seeking work) in the last year at each interview. Each woman reports her labor market activity for the prior twelve months two to five times between the child's first birthday and the child's 12th birthday. We consider a number of thresholds for calculating women's work trajectories – we examined the first ten, twelve, and fourteen years following the first birth -- and found consistent results. Our choice of the first twelve years allows us to maximize sample size while still capturing relevant differences between groups. We use these reports to create our categories of women's work trajectories described below in greater detail:

Steady work (reference) N=782, 30.8% of all workers. We define steady workers as mothers who averaged thirty-five or more hours of work per week during employed weeks between the first child's 1st and 12th birthdays, with an average of 41.2 hours per week. We further limit these women to two, one, or zero bouts of unemployment (defined as one or more weeks unemployed in a given year); these mothers averaged .61 total bouts by the child's 12th birthday (see Table 1).

Pulled back, or part-time work N=1,122, 44.2%. We define pulled back workers as mothers who averaged fewer than 35 hours of work per week during employed weeks between the first child's 1st and 12th birthdays. These mothers also experienced zero, one, or two bouts of unemployment and averaged 21.4 hours of work per employed week, with an average of .85 bouts of unemployment.

Interrupted, or repeatedly unemployed worker N=359, 14.1%. We define interrupted workers as those who experienced at least three distinct bouts of unemployment

between the first child's 1st and 12th birthdays. Interrupted mothers averaged 3.37 bouts of unemployment, and averaged 24.6 hours of work per week while employed.

Stay-at-home mother N=277, 10.9%. We define stay-at-home mothers as those who reported they did not formally re-enter the paid workforce for twelve years (624 weeks) following the first child's birth. Limiting the category to mothers who stayed at home until the eldest child was 12 suggests a long-term commitment to stay-at-home mothering and allows for more theoretically meaningful work categories. These mothers reported very little labor market activity or unemployment on a year-to-year basis, with less than one hour of work per week during weeks worked and .51 average bouts of unemployment.

Selection variables: Our selection equations include variables thought to select women into workforce pathways, and variables associated with both work and health. *Demographic and socioeconomic characteristics.* We account for race-ethnicity and educational attainment prior to birth, as working-class women and women of color are less likely to find good work opportunities and more likely to have time out of the workforce (Alon & Haberfeld 2007). Single mothers ($I = \text{mother is married at birth}$) are more likely to experience poverty and poor health at middle age (Williams et al. 2011). A teenage birth ($I = \text{first birth prior to age eighteen}$) truncates educational attainment, decreases lifetime wages, and is associated with poverty (Hoffman & Maynard 2008). We also include family of origin characteristics (see controls) and cognitive ability (centered) using the Armed Forces Qualification Test (revised), given to all NLSY respondents in 1980.

Barriers to a good job: Women are more likely to leave work when facing barriers to continued employment (Stone 2007). Most mothers in our sample report barriers to good work during young adulthood (around ages 17-21) related to transportation, age, language, and nationality. *Health problems that limit ability to work.* Health limitations likely shape mothers' subsequent workforce pathways. *Pre-pregnancy employment.* Nelson and Smith (1999) define "good work" as year-round and salaried, therefore, we control for whether mothers were employed in salaried, hourly [reference] or no paid work prior to the first birth. *Spousal work hours at birth.* Having a husband who works long hours increases the likelihood that a woman will quit work (Cha 2010: 325). We measure spousal work hours using an internal moderator (spousal work hours prior to birth (standardized) X mother married at birth) (Mirowsky 1999), allowing us to retain single mothers in the model. *Workforce aspirations.* Women's workforce participation may be influenced by their aspirations as young adults (Damaske 2011). NLSY women were asked around ages 17-21 whether they wished to engage in paid work [reference], unpaid family work, or both home and work responsibilities at age 35. *Traditional gender ideologies.* Beliefs about whether working is appropriate for mothers may also shape women's labor market participation (Corrigan & Konrad 2007). We measure gender ideologies (centered) during young adulthood (ages 17-21). *Age at birth.* Age at birth is associated with pre-pregnancy job experience and health following a first birth (Mirowsky 2002).

Control variables: At or before the child's birth, we control for race-ethnicity, nativity, family of origin SES ($I = \text{respondent's mother did not complete high school}$; $I = \text{did not live}$

with two married parents), educational attainment in years (centered), employment status prior to pregnancy, work-limiting health conditions, marital status at first birth, teenage birth, and age at first birth (centered). Our final model includes variables associated with cumulative advantage that may influence health at age 40, including number of biological children, whether the mother completed additional education following her pregnancy (*1=completed additional year or more of education*), net worth (logged and centered), employment status at age forty (*1=no paid work, 1=salaried work, hourly work at age forty [reference]*), lack of health insurance (*1=uninsured*), and marital status (married as reference). We control for mental health scores at age 40 in models predicting physical health, and physical health scores in models predicting mental health (Read & Gorman 2009). Our control variables for models predicting health do not include variables from the selection equation that are not correlated with health, including early work barriers, spousal work hours, work aspirations, and gender ideologies.

RESULTS

Work Pathway Characteristics

Descriptive statistics in Table 1 indicate that steadily working mothers were fairly advantaged relative to other mothers both prior to and following a first birth. Steadily working mothers were more likely to grow up with two married parents, to have mothers who completed high school, to have been married when their first child was born, and to delay a first birth, and were less likely to be black or Hispanic. By age forty, steadily working mothers were more likely to be married, to have completed additional schooling, reported higher net worth, and were more likely to possess health insurance than mothers on other work pathways. Moreover, steadily working mothers reported significantly better mental and physical health than mothers on other work pathways. In sum, steadily working mothers not only reported better mental and physical health, these mothers also enjoyed other advantages related to socioeconomic standing, family of origin, and at-birth characteristics, suggesting they benefited from cumulating advantages across the life course, and reiterating the need to disentangle health benefits associated with work pathway from health benefits associated with pre-birth or demographic characteristics as well as contextual variables at age forty.

Hypotheses 1a-b: Women's selection into work pathways

We first evaluate Hypotheses 1a and 1b, testing the role of selection in shaping mothers' workforce pathways. Semi-standardized variables listed in the top portion of Table 2 are entered into a first-stage selection equation predicting mothers' likelihood to enter into a pulled back, interrupted, or stay-at-home workforce pathway relative to steady work. We standardize all independent variables prior to entering them into the model so that statistically significant coefficients of greater magnitude more strongly predict selection into work. The second stage equation regresses physical health at age forty on work pathways, adjusting for selection. In Appendix I we do the same for mental health, and results are nearly identical.

In support of Hypothesis 1a, women with hourly or salaried work prior to pregnancy, later first births, greater cognitive abilities, less traditional gender ideologies, and aspirations for paid work were most likely to participate in steady work. Relative to steady workers, mothers who “pulled back” were less likely to engage in paid work prior to pregnancy, reported earlier first births, experienced more job barriers, were more likely to aspire to both work and raise a family, and reported lower cognitive ability, supporting Hypothesis 1a. Pulled-back workers were less likely to be Black or Hispanic relative to steady workers, consistent with earlier research that suggests women of color may have fewer opportunities to pull back from full-time employment (Higginbotham 2001). The magnitudes of the coefficients indicate that race-ethnicity and lacking paid employment most strongly distinguished steadily working and pulled back mothers.

We also find support for Hypothesis 1b, finding that the least advantaged mothers prior to pregnancy were more likely to follow interrupted or stay-at-home pathways. Mothers with interrupted work pathways were less likely to have had salaried work prior to pregnancy, more likely to have not engaged in paid work, had earlier first births, and had lower cognitive ability than steadily working mothers, supporting Hypotheses 1a-1b. Age at first birth, lacking paid work, and cognitive ability most strongly predicted an interrupted pathway relative to a steady work pathway. For stay-at-home mothers, age at first birth, lacking paid employment prior to pregnancy, and gender ideologies most distinguished stay-at-home mothers from steadily working mothers, also supporting Hypotheses 1a-1b. The bottom portion of Table 2 shows that after adjusting for selection, steady work is associated with better physical health than pulled back, interrupted, or stay-at-home work. Appendix I shows a similar finding for mental health. Thus, we see initial evidence that early advantages related to cognitive skills, age at first birth, and work history predict subsequent work pathways, and that net of these relationships, steady work is associated with better health than other work pathways.

Hypotheses 2a-b: The relationships between work pathways and health

Table 3 includes fully standardized coefficients evaluating the relationships between work pathways and health. Fully standardized coefficients, which are interpreted as a one standard-unit increase in independent variable *X* leading to a one standard-unit increase in dependent variable *Y*, allow us to evaluate which variables are most strongly predictive of health at age forty. Model 1 of Table 3 replicates baseline relationships [see Table 2 and Appendix I] between work pathways and health, adjusting for selection. Model 2 adds controls measured at or prior to first birth, testing Hypothesis 2a, and Model 3 adds mechanisms that may drive or confound the relationships between work pathways and mothers' health at age forty, testing Hypothesis 2b. This model progression distinguishes associations between work pathways and health that are attributable to pre-pregnancy or at-birth characteristics from those related to contextual variables at age forty.

We see in Model 1 of Table 3 that mothers with steady work experienced significantly better physical health at age forty than mothers on other pathways of work. Model 2 shows that mothers on pulled back pathways reported worse physical health even after adjusting for characteristics related to cumulative advantages/disadvantages. For mental health, the

coefficient among pulled back workers is no longer significant, suggesting that any disparity between pulled-back mothers and steadily working mothers may be attributable to pre-birth characteristics such as race-ethnicity, single parenthood, and work history prior to pregnancy. In Model 2, the negative associations between an interrupted work pathway and mental and physical health persist net of controls, supporting our assertion that work pathways matter net of advantage and disadvantages experienced early in life. For stay-at-home mothers, we are not able to reduce the negative relationships between stay-at-home work and physical health, but do explain the mental health disadvantages of stay-at-home work.

In sum, we see broad but not universal support for Hypothesis 2a: mothers who pulled back from work, followed interrupted pathways, or stayed-at-home reported significantly worse physical health than steadily working mothers, and interrupted mothers also reported worse mental health. These associations persist after adjusting for unequal selection into work pathways and controlling for pre- and at-birth characteristics. Along with work pathways, strong predictors of health in Model 2 include work-limiting health conditions, educational attainment, and age at first birth for physical health, and race-ethnicity, work history, and single parenthood for mental health.

Model 3 adds mechanisms at age forty that may help to explain variation in the relationships between mothers' work pathways and health, testing Hypothesis 2b. These mechanisms capture some of the resources that may benefit steady workers' health, including greater net worth, access to health insurance, a greater likelihood to remain stably married, and greater access to salaried work. Although these mechanisms do not reduce the health deficits associated with interrupted work, we are able to reduce the associations between pulled back work and stay-at-home work and health to non-significance, suggesting that these contextual variables drive part of this relationship as mothers enter into middle age. In particular, lacking paid work at age forty, experiencing a divorce, and number of biological children strongly predicted physical health at age forty, and experiencing divorce and lacking paid work were associated with mental health. Supplemental analyses also show that the coefficients for variables associated with work at age forty – such as wealth and access to insurance – do not change in size or significance when unpaid and salaried work at age forty is excluded from Model 3.

Hypotheses 3a-c: Health Differences Across Work Pathways

How do pulled back workers – women on the modal pathway of work – compare to mothers on interrupted or stay-at-home pathways? How do interrupted or stay-at-home mothers compare to their peers? We evaluate Hypotheses 3a-3c in Table 4 by calculating the SF-12 mental and physical health scores from Table 3, and use postestimation tests to compare health at age forty across all four work pathways. Superscripts indicate statistically significant differences between groups. Across Models 1-3, pulled back mothers experienced significantly better physical and mental health than interrupted mothers after adjusting for selection and our control variables, providing partial support for Hypotheses 3a and 3b. These persistent health differences suggest that although early resources play a role in shaping mothers' work pathways and their subsequent health outcomes, the resulting

work pathways contribute independently to mothers' diverging health outcomes as they enter middle age. For stay-at-home mothers, contextual variables in Model 3 aid in explaining how cumulative disadvantages shape their physical health deficits relative to pulled back mothers. It may be that pulled-back mothers' greater likelihood to achieve additional education following a first birth, to remain married by age forty, or to remain in the workforce [see Table 1] contribute to their better physical health relative to stay at home peers. Stay-at-home mothers are not consistently better or worse off than interrupted mothers, and as such we do not find strong evidence for Hypothesis 4c, suggesting that those following interrupted and stay-at-home pathways may face different challenges across the life course.

DISCUSSION AND CONCLUSIONS

Life course scholars have long argued that the disadvantages that individuals face early in life compound over time, often with deleterious effects on health and well-being (Elder et al. 2003; Wilson et al. 2007). Some of these disadvantages appear to be gendered phenomena that link women's work trajectories after childbirth to mental and physical well-being in middle age (Moen 2001). This paper adds several unique contributions to research on the relationships between gender, work and health by using longitudinal, theoretically driven models that focus on mothers' diverse work pathways and adjusting for unequal selection into these pathways. Our examination of prospective data spanning the years between a mother's first birth and age forty finds that the greatest physical and mental health benefits of work are associated with working steadily full-time during the years following a first birth. Mothers who "pull back" from full-time employment by cutting hours or delaying entry into the full-time workforce report worse physical health (but not mental health) at age forty relative to steadily working mothers after adjusting for pre-pregnancy and at-birth characteristics and accounting for selection, but better physical health than their interrupted and stay-at-home peers. This suggests that part-time work may provide important benefits to women. However, even after adding mechanisms at age forty associated with the resources that steady work provides, mothers who follow interrupted pathways continued to report significantly worse physical and mental health relative to steadily working mothers.

We find that work pathways are not randomly distributed in a population. Rather, pre-pregnancy employment, race-ethnicity, cognitive ability, and age at first birth structure mothers' likelihood to experience a steady work trajectory. Adjusting for the unequal likelihood to engage in steady work is particularly important given that we find that the mothers most in need of the health and economic benefits of full time work – specifically, mothers from disadvantaged backgrounds, younger mothers or Black and Hispanic mothers – are the least likely to have access to steady work. These selection results are added evidence that early life course disadvantages accumulate over time, as the most disadvantaged women are less likely to experience the work pathways associated with the greatest health benefits at age forty.

Yet variables such as pre-pregnancy work experience, cognitive skill, and single parenthood do not simply select women into work. Instead, these early disadvantages set in motion later life events that have serious repercussions for health. Moreover, some of these variables –

notably, single parenthood and race-ethnicity -- not only influence work pathways, they also retain an independent association with mothers' health at middle age, demonstrating the ongoing nature of these relationships.

Why is pulled back work associated with worse physical health than steady work, even after adding controls and adjusting for selection? Supplemental analyses indicate that pulled back workers averaged significantly more weeks per year voluntarily out of the workforce than their steadily working peers. Part-time workers "generally have lower pay, less skilled jobs, poor chances of promotion, less job security, inferior benefits ... and lower status" (Mishel, Bernstein & Boushey 2007: 259), each of which is associated with poorer health (Kim et al. 2008, Ferrie et al. 1998). Yet part-time work does provide important protections, as pulled back workers reported mental health scores similar to those of their steadily working peers after accounting for compositional differences in these groups (see Model 2 of Table 3). These mental health resources may narrow the physical health gaps between steady and pulled back work, as mental health and physical health are strongly related (Read & Gorman 2009).

The health strains associated with interrupted work are consistent across models, and are not explained by our adjustments for selection or control variables. Unstable work is associated with significantly worse self-rated health, poorer health behaviors, psychological distress, and interrupted sleep (Kim et al. 2008; Ferrie et al. 1998). Job instability comes with a high economic and social price, as displaced workers experience difficulty finding new work, lower average wages when work is found, and often a loss of health benefits (Mishel, Bernstein & Boushey 2007). Moreover, the women who followed interrupted work pathways were the most disadvantaged group prior to becoming pregnant and might be particularly vulnerable to social stressors such as unemployment (Thoits 1995: 4).

Like interrupted work, stay-at-home mothering was significantly associated with worse physical and mental health, and this relationship is partially driven by the financial and social resources associated with employment at age forty. Women who stay-at-home may face reduced social networks, financial dependence, and greater social isolation (Stone 2007), all of which may place a strain on health. Additionally, the differential rewards for paid work outside the home and unpaid work done in the home (Moen 2001) may reduce the self-esteem of mothers who stay-at-home, placing them at increased financial risk and creating uncertainty, which may strain health.

The relationships between work pathways and health were generally consistent across physical health and mental health, but operated less strongly for mental health. Both mental and physical health are reliant upon strong social networks, financial security, and access to health care, variables included in our models and associated with work pathways and (albeit to a lesser degree) health at age forty. However, variables associated with the timing and conditions of first birth -- marital status at birth, age at first birth, and educational attainment at birth -- appeared to matter more consistently for physical health than mental health, which may indicate that physical health is more vulnerable to cumulative disadvantage than is mental health. Moreover, our study also supports the widely-held finding that black women report better mental health than white women (Bratter & Eschbach 2005), which may

explain a portion of the inconsistency across outcomes, as race is one of our strongest predictors of selection into work. Our findings suggest that mental and physical aspects of health are interrelated, but not equally reliant upon work pathways and context for women over time.

Limitations and Conclusions

There are several limitations to our analyses. First, because the NLSY79 focuses primarily on employment over time, we have very few health measures from which to draw prior to age forty. Ideally, a life course examination of the relationships between work and health would include longitudinal indicators of both work and health, and future research should use repeated measures of health to analyze these relationships. We are also limited in our ability to dynamically model women's decisions to work as they begin to have children. A work pathway unfolds gradually as life events and economic opportunity influence a woman's desire to work and her opportunities to work after becoming a parent. However, data and methodological limitations lead us to model selection processes in two discrete segments; first using variables measured prior to or at birth, followed by variables that are endogenous to work pathways between the first birth and age forty. Moreover, mothers' decisions to work are shaped by contextual variables we are able to include in our models (such as single parenthood and work experience) as well as broader economic forces such as a changing economy and the types of jobs that are available in women's localities. Although the NLSY Geocode data may allow for a study of the influences of macro- and micro-level employment variables on mothers' decisions to move in and out of work, the scope of such an investigation is large enough to warrant a separate study. We also test the robustness of our findings by replicating all analyses after excluding the 225 women who report work-limiting health conditions prior to pregnancy. Results were identical across models.

Life-course researchers have long contended that gender and cumulative advantages/disadvantages shape the life-course, and much research has focused on the gendered pathways through which family formation, employment, and health shape women's lives between early adulthood and middle age. By examining work histories over women's prime childbearing and childrearing years and using novel indicators of mothers' work pathways to predict midlife health, we advance previous research and document the work pathways that are associated with health benefits for mothers. For the mothers in our study, steady, full-time work was associated with better physical health than other work pathways, and better mental health than interrupted or stay at home pathways. Additionally, part-time work provided key mental health benefits, as well as physical health benefits relative to stay-at-home or interrupted work. Health care and coverage remain a key policy issue in this country and our research suggests that policies promoting better access to full-time work for women through programs such as universal day-care, paid maternity leave, and wage increases would benefit women's long-term health and should be given closer consideration. These findings are important for understanding the social processes shaping health inequality across the life course.

Supplementary Material

Refer to Web version on PubMed Central for supplementary material.

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Table 1

Means and Standard Deviations for Analytical Models

	Steady (N=782)	Pulled Back (N=1,122)	Interrupted (N=359)	Stay at home (N=277)	All (N=2,540)	Range
Work pathways						
Average hours worked per week	41.19 (4.55)	21.37 (8.59)***	24.63 (12.90)***	.26(1.06)***	25.48 (14.50)	0-66
Total unemployment spells	.61(.74)	.85 (.80)***	3.37 (.55)***	.51 (.72)*	1.10 (1.20)	0-5
At or prior to 1 st birth						
Non-Hispanic, non-Black [ref]	46.2%	55.9%***	23.3%***	47.7%	47.4%	0-1
•Black, non-Hispanic ^{ab}	31.1%	22.6%***	57.9%***	27.4%	30.7%	0-1
•Hispanic ^{ab}	22.6%	21.4%*	18.7%	24.9%	21.8%	0-1
Nativity (1=non-US born) ^{ab}	7.5%	8.1%	6.1%	9.5%***	7.6%	0-1
Family of origin SES ^{ab}						
•Mother had less than HS educ.	41.9%	40.1%	56.3%***	55.4%***	47.6%	0-1
•Did not live with married parents	30.3%	33.5%***	43.5%***	41.3%***	33.5%	0-1
Educational attainment in years ^{ab}	12.27 (3.23)	11.91 (3.19)***	11.00 (3.10)***	10.64 (2.49)***	11.46 (3.07)	0-19
Employed in hourly work ^{ab} [reference]	55.1%	51.8%***	37.9%***	35.7%***	49.0%	0-1
•Salaried work	29.7%	19.0%***	6.4%***	11.9%***	19.7%	0-1
•No paid work	15.2%	29.2%***	55.7%***	52.3%***	31.2%	0-1
Health limits work ^{ab}	4.4%	8.2%***	14.7%***	16.2%***	8.9%	0-1
Married at birth ^{ab}	68.8%	69.3%	36.8%***	60.6%*	64.3%	0-1
Spouse work hoursX Married at birth ^b	43.50 (9.54)	43.08 (11.47)	42.36 (10.82)***	44.04 (7.57) [†]	42.96 (11.31)	0-100
Age at first birth ^{ab}	24.3 (3.19)	23.6 (3.46)***	21.2 (3.02)***	22.7 (3.66)***	23.6 (3.47)	14-30
Teenage birth (under age 18) ^{ab}	4.1%	9.1%***	19.5%***	13.3%***	9.5%	0-1
Attitudes toward family and work (at ages 17-21)						
Perceives transportation barrier to a good job (1=yes) ^b	22.5%	28.6%**	46.0%***	37.5%***	30.2%	0-1
Perceives language as barrier ^b	2.6%	5.6%**	4.4% [†]	7.9%***	4.7%	0-1

	Steady (N=782)	Pulled Back (N=1,122)	Interrupted (N=359)	Stay at home (N=277)	All (N=2,540)	Range
Perceives nationality as barrier ^b	4.0%	2.7%	7.0% *	3.2%	3.7%	0-1
Perceives age as barrier ^b	10.9%	9.4%	14.4% [†]	8.7%	10.4%	0-1
Traditional gender ideologies ^b	8.13 (3.43)	9.00 (3.31) ***	8.73 (3.46) ***	9.70 (3.23) ***	8.50 (3.47)	0-22
Aspires to work at age 35 ^b [reference]	57.3%	47.8% ***	60.1% *	47.8% ***	54.3%	0-1
•Work and raise family at age 35	36.5%	44.3% ***	34.1% [†]	44.6% ***	39.2%	0-1
•Raise a family at age 35	5.8%	7.9% ***	5.1%	7.6% ***	6.5%	0-1
Mechanisms at age 40						
Number of biological children ^a	2.16 (.95)	2.58 (1.13) ***	2.59 (1.25) ***	3.38 (1.66) ***	2.54 (1.20)	1-9
Completes additional education ^a	23.3%	19.4% ***	20.0% **	15.9% ***	20.4%	0-1
Net worth, logged ^a	13.97 (.17)	13.97 (.22)	13.88 (.50) ***	13.96 (.18)	14.00 (.15)	.22-15
Hourly work ^a [reference]	57.1%	56.8% ***	60.1% ***	34.4% ***	53.6%	0-1
•Salaried work	49.2%	24.8% ***	19.6% ***	6.4% ***	28.5%	0-1
•No paid work	5.7%	18.3% ***	19.4% ***	59.2% ***	17.8%	0-1
No health insurance ^a	9.5%	17.4% ***	28.9% ***	24.8% ***	19.3%	0-1
Married ^a [reference]	64.6%	68.1% ***	46.4% ***	54.8% ***	59.6%	0-1
•Widowed	1.3%	1.3%	2.0%	2.5%	1.6%	0-1
•Divorced or separated	26.8%	22.8% ***	35.6% ***	24.2% [†]	27.9%	0-1
•Never married	7.3%	7.8%	16.0% ***	18.5% ***	10.9%	0-1
SF-12, physical health percentile	52.86 (7.20)	51.58 (8.60) ***	49.42 (10.21) ***	50.59 (9.93) ***	51.13 (8.96)	11-67
SF-12, mental health percentile	53.13 (7.59)	52.33 (8.53) ***	50.62 (9.83) ***	49.43 (9.62) ***	51.88 (8.85)	7-71

Notes:

[†] p<.10,

* p<.05,

** p<.01,

*** p<.001, two-tailed hypothesis tests.

T-tests and chi-square tests denote differences between steady workers and all other work.

β denotes variables in equations predicting health

β denotes variables in selection equations

Table 2

Multinomial treatment model: Joint estimation of work pathway and physical health at age 40 (semi-standardized logistic coefficients, robust standard errors), N=2,540

Selection Variables	Physical Health		
	PB vs. S	INT vs. S	SAH vs. S
Non-Black, non-Hispanic (reference)	---	---	---
•Black, non-Hispanic	-.43***	.11	-.34**
•Hispanic	-.25***	-.12	-.17†
Mother had less than HS education	-.11†	-.03	-.08
Did not live with two married parents	-.08	.09	-.03
Educational attainment prior to pregnancy	-.03	-.00	-.15†
•Salaried pay prior to pregnancy [reference]	-.13*	-.27*	-.18*
•No paid work	.28***	.37***	.93***
Health limits work	.08	.10	.24**
Married at birth	.05	-.19*	-.09
Spouse work hours X Married at birth	-.09	-.16†	.04
Age at first birth	-.07*	-.85***	-.38**
Teenage birth	.05	-.12	.12
Perceives age as barrier to a good job	-.05	.04	-.08
Perceives transportation as barrier	.13*	.30***	.27**
Perceives language as barrier	.16*	-.02	.13
Perceives nationality as barrier	-.07	.09	-.04
Traditional gender ideologies	.15*	.11	.39***
Aspires to work at age 35 [reference]	---	---	---
•Aspires to raise a family	.01	-.13	.02
•Aspires to work and raise family	.16**	.02	.30**
Cognitive ability	-.16*	-.44***	-.19†
Constant	.45**	-1.48***	-.15***
Physical health at age forty	-.04**	-.14***	-.26***
Constant		.82 ***	
ln(α)		3.14 ***	
$\Lambda_{\text{(Pulled back)}}$		.001	
$\Lambda_{\text{(Interrupted)}}$		.005**	
$\Lambda_{\text{(Stay at home)}}$		.001	
$X^2_{(66)}$		620.10 ***	
Log-pseudolikelihood		-12384.43	

Notes: PB = pulled back work pathway, S = steady pathway, INT = interrupted pathway, SAH = stay at home pathway

Fully standardized logistic coefficients (hand calculations) for multinomial treatment models predicting mothers' work pathways and health at age 40 (N=2,540)

Table 3

	Model 1		Model 2		Model 3	
	Physical	Mental	Physical	Mental	Physical	Mental
<u>Work Pathway</u>						
Steady [reference]	---	---	---	---	---	---
Pulled back	-.04**	-.17*	-.36*	-.18	-.10 [†]	.05
Interrupted	-.14***	-.06***	-.65***	-.51**	-.19**	-.25*
Stay at home	-.26***	-.09**	-.50**	-.23	-.01	.05
<u>At or prior to 1st birth</u>						
Non-Hispanic, non-Black [reference]	---	---	---	---	---	---
•Black, non-Hispanic	---	---	-.07	.49**	.00	.42***
•Hispanic	---	---	.06	.23	-.04	.20*
Nativity (1=not born in US)	---	---	.24*	.10	.10*	.07
Mother has less than HS educ.	---	---	-.09	-.16	-.06	-.12
Did not live with married parents	---	---	-.02	-.12	.01	-.04
Educational attainment (years)	---	---	.57***	.18	.14*	-.03
Hourly work prior to first birth [ref]	---	---	---	---	---	---
•Salaried work	---	---	.22 [†]	.27*	.04	.16 [†]
•No paid work	---	---	.23	-.04	.12 [†]	-.02
Health limits work	---	---	-.58***	-.31 [†]	-.21**	-.17 [†]
Married at first birth	---	---	.34*	.34*	.10	.15
Age at first birth	---	---	.48**	.13	.27***	.05
Teen birth	---	---	.54***	.02	.22***	-.01
<u>Mechanisms at age 40</u>						
Number of biological children	---	---	---	---	.25***	-.11
Completes additional education	---	---	---	---	-.01	-.11
Net worth, logged	---	---	---	---	.07	.17 [†]

	Model 1		Model 2		Model 3	
	Physical	Mental	Physical	Mental	Physical	Mental
Hourly work at age 40 [reference]	---	---	---	---	---	---
•Salaried work	---	---	---	---	.03	-.02
•No paid work	---	---	---	---	-.78***	-.57***
No health insurance	---	---	---	---	-.06	-.04
Married [reference]	---	---	---	---	---	---
•Widowed	---	---	---	---	-.02	-.14†
•Divorced or separated	---	---	---	---	-.23***	-.40***
•Never married	---	---	---	---	-.03	-.16
Mental or Physical health at age 40	---	---	---	---	.00	.01†
ln(α)	3.14***	3.27***	3.16***	3.28***	3.23***	3.23***
Λ _i (Pulled back)	.00	.00	.00	.00	.00	.00
Λ _i (Interrupted)	.00	.00†	.00†	.00	.00†	.00
Λ _i (Stay at home)	.00	.00*	.00	.00	.00	.00
X ²	620.10***	598.1***	703.4***	646.4***	809.9***	695.6***
Log-pseudolikelihood	-12384.4	-12259.5	-12357.3	-12245.4	-12266.6	-12212.1

Notes:

† p<.10,

* p<.05,

** p<.01,

*** p<.001, two-tailed hypothesis tests.

Table 4

Predicted values of physical and mental health at age 40 calculated from Table 3 (N=2,540)

	Model 1		Model 2		Model 3	
	Physical	Mental	Physical	Mental	Physical	Mental
Steady	52.53 ^{bcd}	52.88 ^{bcd}	52.52 ^c	52.82 ^c	52.53 ^c	52.83 ^c
Pulled back	51.31 ^{acd}	51.97 ^{ac}	51.26 ^{acd}	52.00 ^c	51.26 ^c	51.98 ^c
Interrupted	48.63 ^{ab}	50.07 ^{ab}	48.80 ^{ab}	50.12 ^{ab}	48.74 ^{abd}	50.11 ^{abd}
Stay at home	49.72 ^{ab}	51.05 ^a	49.69 ^{ab}	51.06	49.78 ^c	51.08 ^c

^a Health at age 40 is better or worse than steady workers, $p < .05$

^b Health at age 40 is better or worse than pulled back workers, $p < .05$

^c Health at age 40 is better or worse than interrupted workers, $p < .05$

^d Health at age 40 is better or worse than stay at home mothers, $p < .05$