Tethered lives: A couple-based perspective on the consequences of parenthood for time use, occupation, and wages

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ABSTRACT

Prior research on parenthood effects has typically used single-sex models and estimated average effects. By contrast, we estimate population-level variability in partners' changes in housework hours, paid work hours, occupation traits, and wages after becoming parents, and we explore whether one partner's adjustment offsets or supplements the other's. We find tradeoffs between spouses on paid work adjustments to parenthood, but complementarity in adjustments to housework hours, occupation traits, and wages. The effect of parenthood on wives' behaviors is larger and more variable than on husbands' behaviors in every domain. The modest variation between husbands in work responses to parenthood explains little of the variation in the motherhood penalty, while variation in wives' own behaviors plays a larger role. We refer to this pattern as *tethered autonomy*: variation across American couples in work responses to parenthood is shaped primarily by variation in wives' adjustments, while husbands' work acts largely as a fixed point.

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1. Introduction

Concluding a 1983 *Social Forces* article, Ronald D'Amico wrote: "As the dual career family increasingly becomes the normative pattern, researchers can no longer neglect the relationships between spouses' employment decisions and achievements" (p. 1203). Despite the intervening thirty years since this exhortation, analyses of the work-family association remain focused at the individual level. Single-sex models are appropriate for understanding the experiences of unpartnered individuals and estimating gender inequality in the costs of family responsibilities, but they are ill-suited to examining the interplay between partners' behaviors.

In this paper, we examine how partners' time in paid and unpaid labor, occupation traits, and wages jointly respond to parenthood. We extend the literature in several ways. First, we explore to what extent the consequences of parenthood for partners' work are characterized by *tradeoffs* (e.g., wives who experience large increases in housework time following parenthood will tend to have husbands with the smallest increases in housework time), *complementarity* (e.g., wives who experience large increases in housework time following parenthood will tend to have husbands who increase their housework time more than most husbands), or *independence* (e.g., knowing that a wife experienced substantial increases in

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housework time following parenthood gives no information about the husband's housework adjustments). Second, prior research has estimated average changes at parenthood (or subgroup variation), but has not documented the extent of couple-to-couple variation in how husbands and wives respond to parenthood in terms of their time use, occupation traits, and wages. We more fully describe the range of variation in work-parenthood accommodations among American couples. Third, we examine how much of the between-couple variation in the motherhood wage penalty and fatherhood wage premium can be explained by variation in spouses' time use and occupation traits. Previous studies have tested whether wives' employment status moderates the fatherhood wage premium (Hodges and Budig, 2010; Killewald, 2013; Lundberg and Rose, 2000), with the logic that, when wives specialize in home production, their husbands' wages benefit because they are relieved of domestic labor responsibilities. However, it is unclear how variation in spousal behavior compares in importance to other sources of variation shaping the wage consequences of parenthood.

Drawing on the autonomy perspective, which suggests that women's household labor time is determined by their own earnings, not their earnings relative to their husbands' (Gupta, 2006, 2007), we expect that variation in the motherhood penalty is primarily a function of how women combine paid and unpaid work during motherhood, with variation in husbands' behaviors playing only a modest role. At the same time, we argue that, if wives' unpaid work were reallocated in part to husbands and husbands' paid work reallocated in part to wives, the motherhood penalty could be reduced. We refer to this dual logic as *tethered autonomy*; husbands' behaviors act as a largely fixed point, with the result that wives' wage outcomes depend largely on their own traits and behaviors.

2. Theoretical framework

Women experience a wage penalty when they transition from childlessness to motherhood (Budig and England, 2001; Gangl and Ziefle, 2009; Killewald and Gough, 2013; Waldfogel, 1997), while, at least for married men, fatherhood is associated with a wage premium (Glauber, 2008; Killewald, 2013; Lundberg and Rose, 2000). Employer discrimination may contribute to both the motherhood penalty and the fatherhood premium. Ridgeway and Correll (2004) argue that mothers are perceived by employers as less competent, regardless of actual behavior and ability, and Correll et al. (2007) find evidence of hiring discrimination against mothers. Conversely, Hodges and Budig (2010) argue that the fatherhood premium is shaped in part by the extent to which fathers' traits match workplace norms of masculinity.

In addition to employer discrimination, gender differences in the wage consequences of parenthood are partially due to gender differences in the effect of parenthood on unpaid work time, paid work time, and job traits. Partnered parenthood is associated with substantial increases in women's housework time, but not men's (Sanchez and Thomson, 1997), and housework time is in turn negatively associated with wages (Hersch and Stratton, 1997; Noonan, 2001). Parenthood is also associated with less time in paid labor for wives, but the same or slightly more time for husbands (Glauber, 2008; Kaufman and Uhlenberg, 2000; Lundberg and Rose, 2000; Sanchez and Thomson, 1997), and lost labor market experience and reduced work hours contribute to the motherhood wage penalty (Budig and England, 2001; Gangl and Ziefle, 2009; Killewald and Gough, 2013; Waldfogel, 1997). There is less evidence on the role of occupation characteristics. However, motherhood is associated with declines in occupational prestige and shifts toward more heavily female occupations, both of which imply wage losses for mothers, over and above the consequences of lost work experience and employment interruptions (Gangl and Ziefle, 2009). These findings highlight that the work consequences of parenthood are often in opposite directions for wives and husbands (e.g., a motherhood wage penalty but a fatherhood wage premium). Furthermore, the magnitudes of these consequences are typically larger for wives than for husbands.

Why do such gender differences in the work consequences of parenthood persist? The specialization perspective suggests that partners' allocation of effort to paid or unpaid labor depends on economic comparative advantage (Becker, 1991), with each spouse spending more time in the tasks at which s/he is more effective. Under this framework, couples may tend to allocate primary responsibility for child-rearing and household labor to the wife and primary responsibility for paid labor to the husband, due to men's higher average wages or women's greater (perceived) skills in home tasks. The intra-household bargaining perspective (Lundberg and Pollak, 1993; Manser and Brown, 1980; McElroy and Horney, 1981) suggests that the allocation of resources within couples is the outcome of bargaining between partners, with the partner who controls more resources better able to negotiate for his/her preferred outcomes. Because men tend to control more resources, gender differences in the work consequences of parenthood might reflect successful bargaining by husbands to allocate new unpaid labor responsibilities associated with parenthood primarily to wives.

Gender scholars also point to enduring gender norms that differently encourage and reward men and women, and particularly mothers and fathers, for work- and home-related activities. Traditionally, the "good father" and "good worker" roles are complementary, as fatherhood is normatively associated with wage-earning and providing for children financially (Forste et al., 2009; Townsend, 2002). By contrast, the traditional expectations of the "good mother" role are inconsistent with the "good worker" role. Mothers are expected to place the needs of their offspring above all else and to invest substantial time in "intensive mothering" (Blair-Loy, 2003; Hays, 1996).

In light of these gendered expectations, scholars have proposed that households are not merely engaged in the production of goods and services, but enact and produce gender through engaging in gender-typical activities (Berk, 1985; West and Zimmerman, 1987). The "doing gender" perspective provides one explanation for enduring gender inequality in work outcomes, regardless of improvements in wives' human capital and wage-earning potential relative to their husbands'. For example, even wives who out-earn their husbands report substantial household labor responsibility, in part in order to meet

expectations of femininity and the wife role (Tichenor, 2005). It is therefore not surprising that parenthood is associated with larger average changes in women's work lives than men's: taking on the motherhood role and its associated responsibilities requires, in general, a greater adjustment to women's performance of the employee role than taking on the fatherhood role requires of men.

We argue that the "doing gender" perspective can be leveraged to understand aspects of family life beyond gender differences in the average effects of parenthood. Specifically, we draw on this perspective to answer the following three research questions, each of which we discuss in more detail in the following sections. First, how are partners' adjustments to work behavior (unpaid work time, paid work time, and occupation traits) related following the birth of a child? This allows us to determine whether variability in spouses' responses to parenthood is best characterized by tradeoffs, complementarity, or independence. Second, how much variability is there in how partnered men and women respond to parenthood, and is the extent of variability different by gender? This analysis provides descriptive information on the extent of heterogeneity in how American husbands and wives "do parenthood." Third, how much of the variability in the motherhood penalty and fatherhood premium can be explained by variability in spousal behavior versus variability in own work behavior beyond any effects of spousal behavior? Prior research has found that the fatherhood premium is smaller for men whose wives spend more time in paid labor (Killewald, 2013),[1] but we know of no prior research that has assessed the relative importance of variation in spousal work behavior versus other factors for variation in the wage changes associated with parenthood.

2.1. How are partners' time use, occupation, and wage changes following parenthood related?

Moen and Sweet (2004) criticize much work-family research for its tendency to "assume the individual as decision maker, ignoring the fact that increasingly *couples* are making conjoint decisions" (p. 218). Responding to their call for couple-level analyses, we estimate the interrelationships between partners' responses to parenthood.

One possibility is that partners are engaged in *tradeoffs* on job traits and time use, with an individual's increased efforts in one domain allowing or requiring the other partner to reduce efforts (Becker, 1991). Consistent with this perspective, wives are more likely to exit the labor force when their husbands work extremely long hours (Cha, 2010), and fatherhood leads to a decline in a married man's paid work hours when his wife remains employed, but to an increase when she does not (Lundberg and Rose, 2000). In dual-earner couples, one partner may take a "job" so that the other may have a "career" that takes priority, or partners may alternate across the life course which partner invests heavily in paid labor and which makes greater accommodations for family considerations (Becker and Moen, 1999).

Yet we lack direct evidence on how partners' changes in work behaviors following the birth of a child are related. An alternative possibility is that spouses' behaviors are *complementary*. Just as the specialization perspective does not explain the entirety of the division of labor, it may not fully explain the interrelationships between partners' behaviors. Partners may match on traits such as preferences for time with children, which could lead to positive between-partner associations in paid and unpaid work responses to parenthood. Another possibility is that partners experience similar responses to parenthood because they share external circumstances, such as the number, ages, and needs of their children. Finally, fathers' unpaid work may supplement mothers' rather than relieving mothers of household labor. For example, Craig (2006) finds that Australian partnered fathers spend only 13 percent of their child care time as the sole parent present. As part of doing gender through intensive mothering, mothers may act as managers of child care and housework time, involving fathers as needed and as possible. In this case, women who increase their time in unpaid labor the most as mothers are likely to be partnered to men who increase their housework time more than most fathers.

Complementarity in partners' responses to parenthood does not negate gender differences in these responses but describes whether partners tend to be more similar to one another in their responses to parenthood than to a randomly-chosen member of the other sex. For example, if we say that spouses assortatively mate on height, this does not imply that there is no average gender difference in height. Instead, it implies that men who are taller than average tend to be married to taller-than-average women. In our context, complementarity suggests that women who increase their household labor more than the average woman after becoming a mother will be partnered to men who increase their average housework time more than the average man after becoming a father. Such a pattern does not imply the absence of gender differences in the responsibilities and effects of parenthood, but it suggests that post-parenthood adjustments are not zero-sum within couples.

Finally, spouses' post-parenthood changes in work behaviors and wages may be *independent*. For wages, this could occur if variation in the motherhood penalty and fatherhood premium across individuals is due mostly to variation in employer discrimination. In this case, we would expect that work behaviors explain little of the variation in the motherhood penalty and fatherhood premium, since the variation is due to employers, not workers.

Each of these logics of between-spouse associations in the consequences of parenthood—tradeoffs, complementarity, and independence—offers different insights about the role of the family in economic inequality. If spouses' responses to parenthood follow tradeoffs, fathers' gains may come only at the expense of mothers' losses, and vice versa. In this case, at least for partnered mothers, increasing fathers' participation in unpaid labor and reducing overwork may be crucial to realizing continued declines in gender inequality. On the other hand, if spouses' responses to parenthood are characterized by complementarity, this suggests that partnered parenthood has consequences for inequality *between* as well as within

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[1] Hodges and Budig (2010) find that this moderating effect holds for Latino fathers, but not white or African American fathers.

families, with both partners in some couples better able to defray the wage costs of parenthood than their peers. If the couples who experience the most favorable wage changes at parenthood are those who are otherwise economically advantaged, variation in the wage consequences of parenthood may contribute to increasing economic inequality among American families with children (Western et al., 2008). Finally, if spouses' responses to parenthood are independent, this suggests that efforts to reduce gender inequality in the consequences of parenthood may be most effective if they are focused on supports that help mothers combine employment and parenting, such as child care and parental leave, regardless of whether mothers are partnered or not. In other words, if partners' responses are independent, partnered mothers may face essentially the same constraints as single mothers, with little opportunity to transfer household labor to their male partners.

2.2. How much variability is there in the consequences of partnered parenthood for men's and women's time use, occupations, and wages?

In addition to criticizing work-family research for an individual-centric rather than couple-centric perspective, Moen and Sweet (2004) argue that prior research has tended to focus on central tendencies—averages and average effects—rather than variation. Understanding the average effects of motherhood and fatherhood on men's and women's work lives is important, and much research has been devoted to this effort. However, understanding variation is a useful complement that can provide new theoretical insights as well as a more complete description of how the effects of parenthood are experienced by American couples. Recent research on the motherhood penalty and fatherhood premium has begun to explore this heterogeneity, considering how the wage consequences of parenthood vary by characteristics such as race, marital status, wage level, education, occupation type, birth timing, and child age (Anderson et al., 2003; Budig and Hodges, 2010; Glauber, 2007, 2008; Hodges and Budig, 2010; Kahn et al., 2014; Killewald, 2013; Killewald and Bearak, 2014; Taniguchi, 1999). We extend this literature in several ways. First, we provide an estimate of the total population-level variation in the wage consequences of parenthood. While some variation in effects across individuals is almost assured, the magnitude of this variation is unknown. If the effects of parenthood on wages are highly variable, this suggests considerable heterogeneity in how American couples experience the work-family intersection. Furthermore, understanding the scale of total variation in these effects helps to put the magnitude of between-group differences in context. Second, we explore variation in the non-wage work consequences of parenthood: paid work hours, housework hours, and occupation. Third, we estimate to what extent variation in wage consequences can be explained by variation in adjustments to paid and unpaid labor time and occupation. Finally, we are specifically interested in how variability in the work consequences of parenthood differs by gender and what this variation reveals about gendered expectations of family life for American couples.

As described previously, the roles of mother and employee tend to conflict more than the roles of father and employee. We expect that, in addition to greater average changes in work behavior following the transition to parenthood for women than for men, women will also have more variability in these changes, as they are differentially able to reconcile the competing demands of employment and motherhood. For example, Budig and Hodges (2010) hypothesize that high-wage mothers may have greater resources to pay for child care, allowing them to maintain high rates of employment. More generally, Gerson (1985) argues that women face the "hard choices" of combining work and family, and we expect substantial variability in how mothers make these combinations.

For men, for whom the roles of father and employee are primarily compatible, we do not expect substantial variation in the effects of fatherhood on wages, job traits, or time use. Likewise, while husbands face fewer challenges to combining parenthood and employment, they also face strong norms of wage-earning and financial providership (Riggs, 1997; Townsend, 2002). Based on either of these perspectives, we expect that husbands will primarily persist in full-time labor after becoming fathers, with both little average change in behavior and little variation among men. We expect both larger average changes and greater variability among wives.

2.3. How much of the variation in the motherhood wage penalty and fatherhood wage premium can be explained by variation in spousal work behavior versus variation in own work behavior?

In general, individuals' wages are higher when they accumulate more labor market experience (Mincer, 1974) and lower when they spend more time in household labor (Hersch and Stratton, 1997; Noonan, 2001). Furthermore, occupations shape wages net of individual traits (Mouw and Kalleberg, 2010; Weeden, 2002). We expect that individuals' adaptations in these domains—paid work hours, unpaid work hours, and occupation traits—following parenthood explain a portion of the motherhood penalty and fatherhood premium. Prior research consistently shows that lost labor market experience and part-time labor are important mediators of the motherhood penalty (Budig and England, 2001; Gangl and Ziefle, 2009; Killewald and Gough, 2013; Waldfogel, 1997). Unpaid labor time and work traits, including occupation, may also partially mediate the motherhood penalty, net of work experience (Gangl and Ziefle, 2009; Kühhirt and Ludwig, 2012), although there is less research on the mediating role of these factors.

Why should one spouse's work behaviors affect the other spouse's wages? Social scientists have often assumed tradeoffs between spouses on work, with the implied consequence that spousal work behaviors have indirect effects on wages via own work behaviors. For example, husbands' wages tend to be higher when their wives are employed less than full time (Chun and Lee, 2001; Glauber, 2008; Gray, 1997). By the logic of household specialization, wives' reduced investments in paid labor allow them to perform more unpaid labor, which in turn allows their husbands to devote less effort to unpaid labor and more to paid

labor, increasing wages. Therefore, individuals' wages are expected to be higher when their spouses spend more time in unpaid labor, spend less time in paid labor, and work in less-intensive occupations. Of course, it is also possible that one spouse's work behaviors will have direct effects on the wages of the other spouse, such as a wife's housework supporting her husband's career through the hosting of work functions, or an absence of paid work giving her time to directly help perform her husband's paid job, such as by typing research notes or strategizing career advancement.

Despite the widespread notion that individuals' wages can be shaped by their partners' work behaviors, we hypothesize that variation in husbands' time use and occupations will explain little of the variation in the motherhood wage penalty. Women's choices about combining employment and parenthood are "hard" in part because husbands' work behaviors vary little with their wives' work characteristics. The responsibility of husbands is largely defined as support for whatever labor supply choices their wives make, rather than considering changes in their own employment (Blair-Loy, 2003; Hochschild, 1989; Stone, 2007). There is no clear association between wives' wages and husbands' labor supply (Blau and Kahn, 2007), husbands are no more likely to quit their jobs when their wives work extremely long hours (Cha, 2010), and their housework hours do not increase with increases in their wives' earnings (Gupta, 2006; Killewald, 2011). Thus, variation among partnered women in the motherhood penalty is expected to depend primarily on the "hard choices" made by each woman, while the behavior of husbands may largely act as a fixed point.

We draw on but adapt the autonomy perspective from the household labor literature to describe how the sizes of wives' motherhood penalties are likely to vary with the behaviors of their husbands. Gupta's (2007) autonomy perspective on household labor argues that variation in wives' housework time is mostly a function of wives' own earnings, not their earnings relative to their husbands'. Rather than depicting spouses as engaged in a negotiation about how to divide housework, autonomy describes wives' decisions as largely independent of their husbands' behaviors or characteristics, consistent with evidence that the association between earnings and housework time is similar for partnered and single women (Gupta, 2006).

To reflect gender differences in both the average effects of parenthood and the extent of within-sex variability in these effects, we refer to our perspective as *tethered autonomy*. We expect that, if the division of labor in the household were altered to reduce wives' household labor and increase paid labor, while making the opposite changes for their husbands, the motherhood penalty would be reduced. In this way, wives are *tethered*—their motherhood penalty depends in part on the division of labor in the household and the interrelationships between partners' adjustments to parenthood. However, because of the small variation among husbands in work responses to parenthood, and potentially a lack of between-partner tradeoffs in work effort, we expect that variation in husbands' work behaviors explains little of the variation in the motherhood penalty. Instead, we expect that most of the variability in the motherhood penalty is due to variation in wives' own work behaviors — their own "hard choices"—over and above variation in their husbands' behaviors, making wives in this way *autonomous*.

3. Data

To answer our research questions, we measure couples' work and wage outcomes in the 1984–2013 waves of the Panel Study of Income Dynamics (PSID) (Panel Study of Income Dynamics, 2015). We chose this time period so that we have paid work hours, housework hours, occupation, and earnings measured in each wave. The PSID is a household-level panel, with symmetric information collected about both partners in a different-sex marriage or long-term cohabiting union,[2] making it ideal for our couple-level analyses.

The PSID began in 1968 with a national sample of American households. Members of the original sample and their descendants have been followed annually or biennially since then. In 1997, the panel was refreshed with an immigrant sample, which we include. We restrict our sample to couples whose members are the head of the household—defined by the PSID as the male partner in different-sex couples—and his wife or long-term cohabiting partner, because these are the only household members for whom detailed employment and income data are collected. When unmarried partners have lived together for more than one year at the time of the survey, partners are treated equivalently to spouses in terms of data collection. For simplicity, we refer to "spouses" and "partners" interchangeably throughout. There are too few cohabiting couples to analyze this group separately. However, we estimated all our models on a sample restricted to married couples and found results very similar to those based on the full sample.

Couples are eligible for our analytic sample if the partners transition to first-time parenthood together during the 1984–2013 period and were surveyed by the PSID during this period at least once before and once after the birth of their first child. We conclude that partners made the transition to first-time parenthood together if the oldest child matched to each parent in the PSID's Family Identification Mapping System (FIMS) is the same. When we are unable to determine parental status based on FIMS, we supplement by considering partners to have become first-time parents together when their reports of the years of birth of their first children match. Since we require all couples in our sample to be observed at least once while childless and once as parents, this implies that the partners had a first birth in the same calendar year and were a couple both before and after the birth. Couples enter our sample in the first year in which both partners are at least 18 years of age and in a marriage or long-term cohabiting relationship, and they remain in the sample until union dissolution, 18 years after the birth

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[2] Same-sex couples are not included because detailed employment and income data are not collected on the same-sex partner or spouse of the household head.

of their first child, sample attrition, or either partner reaches age 60. To avoid including observations for which wages are a poor indicator of earnings potential, we exclude observations in which either member of the couple was a student (less than 3 percent of observations).

Paid work hours. The PSID constructs measures of annual work hours based on a variety of questions about time spent in paid work during the calendar year prior to the current survey year. For each calendar year t, we use information on paid work hours and annual income collected in survey year $t + 1$, so that it refers to the labor market outcomes of year t.[3] Although we include the 2013 PSID wave, the latest year in our sample is 2012–the year referred to by the 2013 paid work reports. We construct average weekly paid labor hours by dividing annual hours of paid work by 50 weeks–assuming two weeks of vacation per year–for comparability with the weekly housework time reports.

Wage. Consistent with prior research, our financial outcome is the log of hourly wages (Budig and England, 2001; Glauber, 2007; Killewald, 2013; Waldfogel, 1997). We measure an individual's hourly wage in the prior calendar year by dividing annual labor income by annual employment hours, again matching this measure to the prior calendar year of data. Annual labor income is constructed by the PSID based on responses to multiple questions about income sources. Our measure roughly captures an effective wage rate after accounting for overtime pay, bonuses, commissions, and so on. Values are adjusted to 2012 dollars using the Bureau of Labor Statistics Consumer Price Index. In the main wage analyses, we restrict the sample to individuals with non-zero employment hours in the previous year.

Housework hours. The PSID collects information on individuals' housework hours during an average week, with interviewers typically specifying "I mean time spent cooking, cleaning, and doing other work around the house."[4]

Occupation traits. We considered three occupation traits as proxies for demanding job schedules or lack of accommodations for the demands of parenthood: the percent of occupation incumbents who work part-time (usual hours last year fewer than 35 per week), the percent of occupation incumbents who engage in overwork (usual hours last year 50 or more per week), and the percent of incumbents who are female. We limited occupation incumbents to those ages 18–60 who reported non-zero usual hours of work in the prior year. Preliminary analyses revealed that, net of the percent employed part-time in an occupation, the percent engaged in overwork and the percent female in the occupation had very little explanatory power for variation in the motherhood penalty or fatherhood premium. Therefore, in our main results we consider only the percent employed part-time in the occupation. To generate occupation characteristics, we used data from the Integrated Public Use Microdata Series (IPUMS) (Ruggles et al., 2015), which provides 5 percent samples of the 1980, 1990, and 2000 censuses, and the 2005–2009, 2006–2010, and 2008–2012 American Community Survey (ACS) 5-year samples. We created a consistent set of occupation codes using crosswalks provided by IPUMS. To create year-specific measures of occupation traits, we linearly interpolate between available years and then match these measures to PSID sample members' three-digit occupations in each wave, for sample members currently working for pay.[5] For the 5-year ACS samples, we treat them as representative of the middle year (2007, 2008, and 2010).[6]

Parenthood. In each year, we construct an indicator of whether the partners are parents. Different outcomes require somewhat different measures. In each wave, housework hours and occupation are reported as of the time of the survey. For these outcomes, we consider partners to be parents if the month and year of the current interview is later than the month and year of birth reported for the first child born to the couple.[7] Earnings and employment hours, however, are reported for an entire calendar year. Therefore, we consider partners to be parents if the first child was born in a calendar year prior to the current year and childless if the first child was born in the current calendar year or later. The two measures agree in more than 97 percent of the observations. We drop observations for which parental status is unknown by either measure and those for which it was not possible to determine whether the parents shared a first child (about 4 percent of observations that could not be otherwise excluded from the sample of joint parents).

Share of full-time to date. When paid work hours are our outcome, we use the measure of weekly hours in the current calendar year, as previously described. However, when we examine how much of the variation in the motherhood wage penalty and fatherhood wage premium can be explained by work behaviors, we want to capture that prior work experience affects wages. In each year we measure an individual's paid work hours as a proportion of full-time labor (2000 h), top-coding at one. We then create a composite measure of what fraction of full-time the individual has worked since first being observed in the couple by averaging these measures across all prior years. A score of one on this variable indicates that the individual has worked full-time in every (observed) year since entering the union, while a score of zero indicates no employment over this history.

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[3] Since 1997 the PSID has collected data biennially. For these years, we use data on paid work hours and income from survey year $t + 1$ as information about the experiences of calendar year t. For other covariates, we impute the values from survey year $t − 1$ to calendar year t. For age and age of the youngest child (among parents), we increment by one.

[4] This may underestimate time in traditionally male household tasks, such as home repair or auto maintenance. We have no reason to believe it will bias the within-couple correlation in housework time changes.

[5] Beginning in the 2003 survey wave, occupation information is also included for individuals who have worked for pay at any point in the prior two calendar years.

[6] PSID year 2012 is assigned the 2010 ACS values, because it is the latest available wave of 5-year ACS data.

[7] We determine the child's birth month and year from the mother's report of the month and year of the birth of her first child, supplementing with the father's report when the mother's information is not available. If the timing of the child's birth cannot be determined from the parents' fertility files, we use the child's birth month and year as reported in the child's own individual-level demographic information.

Ideally, we would measure an individual's entire work history and compute work experience to date. However, this information is available for at most one partner in the couple. Additionally, after surveys become biennial in 1997 we lack paid work hours for intervening years. Because of these limitations, we create a share measure, based on available years, rather than attempting to impute an absolute work experience measure.

Control variables. In all models, we adjust for life-cycle effects by controlling for a quadratic in the individual's age. Because the age-earnings profile varies by education (Heckman et al., 2006), we allow age to interact with current educational attainment in all models. Education is categorized in years of completed schooling: less than 12, exactly 12 (high school degree), 13—15 (some college), and 16 or more (college degree). We control for the individual's race, measured as non-Hispanic white, non-Hispanic black, Hispanic, and other.[8] The couple's region of residence is measured in five categories (Northeast, North Central, South, West, and foreign). As a coarse proxy for family attitudes, we include a measure of religious affiliation (Catholic, non-Catholic Christian, other, and none). We measure health with a dummy variable set to one if the individual reports a health condition that limits the amount or kind of work s/he can perform and a dummy that indicates whether s/he reported poor or fair health (as opposed to excellent, very good, or good). We include a series of dummy variables for the calendar year.

4. Methods

We employ random-intercept random-slopes models, a subclass of hierarchical linear models (HLM), or random-effects models. Random-effects models are most appropriate for our analysis, since we are interested in estimating between-spouse correlations in the work consequences of parenthood, variability in these consequences, and how much of the variability in the motherhood penalty and fatherhood premium is explained by own and spousal work behaviors. Our models are three-level, with years nested within individuals nested within couples. We represent our Baseline model as follows:

$$outcome_{ist} = \alpha + \beta_i mom_{ist} + \gamma_i dad_{ist} + \zeta' x_{ist} male_{is} + u_i + v_{is} + \varepsilon_{ist} \tag{1}$$

$$\beta_i = \eta + r_i \tag{2}$$

$$\gamma_i = \varpi + \rho_i \tag{3}$$

Equation (1) indicates that, within a couple (i), a spouse's (s) outcome ($outcome_{ist}$)—either housework hours, paid work hours, percent employed part-time in the occupation, or log hourly wage—in a given period (t) is a function of a constant (α), whether s/he is a parent (mom_{ist} and dad_{ist}), a vector of time-varying and time-invariant covariates (x_{ist}), all of which are allowed to vary by sex ($male_{is}$) in their associations with the outcome, and error terms. u_i is the couple-specific random intercept, capturing any unobserved traits that partners share and that are associated with their outcomes both before and after becoming parents. v_{is} is an individual-specific effect, and ε_{ist} is a person-period effect.

Equations (2) and (3) show that the changes in outcomes associated with motherhood (β_i) and fatherhood (γ_i) are the only slopes that are allowed to vary randomly across couples. η and ϖ are the average outcome changes associated with motherhood and fatherhood, respectively. Consistent with prior research, we expect that parenthood will have a larger effect on women's work outcomes than men's ($|\eta| > |\varpi|$).

r_i and ρ_i indicate the random between-couple variation in the magnitudes of these changes. These components allow us to answer our research question about the extent of within-sex variation in the consequences of parenthood. By comparing the standard deviations of r and ρ, we test our hypothesis that wives have more variability than husbands in the changes in paid and unpaid work hours, occupation traits, and wages they experience following parenthood ($sd(r) > sd(\rho)$).

To test whether spouses are engaged in tradeoffs, complementarity, or independence in their changes in outcomes from childlessness to parenthood, we examine how partners' random effects are associated. If the association ($corr(r,\rho)$) is negative, we find evidence for tradeoffs, positive associations indicate complementarity, and an association close to zero suggests independence.[9]

For normalization, all error terms are mean zero. We assume that each error term is normally distributed and that error terms from different levels of the model are uncorrelated. In other words, ε and v are both assumed to be uncorrelated with all other error terms, but u, r, and ρ may be correlated. By allowing u to be correlated with r and ρ, we allow that cross-couple variation in changes at parenthood may be correlated with unexplained cross-couple variation in pre-parenthood outcomes. For example, couples who are already doing an unusually large amount of housework while childless may have less room to increase their housework time post-baby.

In these Baseline models, we describe the gross associations between partners and the amount of variability for both men and women in post-parenthood changes in housework hours, paid work hours, percent part-time in the occupation, and log wages. Because in these models we want to estimate the total variation in the responses to parenthood, we do not control for

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[8] An individual's reported race may vary across survey waves. Because the PSID's questions on race generally improved over time, we use the most recent report for each individual and apply this report backward, creating a time-invariant measure.
[9] The correlation in the random error terms is identical to the correlation of the individual-specific effects (β and γ), because η and ϖ are constants and therefore do not affect the correlation.

variables that are potentially endogenous to parenthood and also correlated with outcomes, such as prior labor market experience. For example, if there is a great deal of variability in the motherhood penalty because mothers differ greatly in how much they reduce their paid work hours after becoming mothers, we do not want to control out this association when answering the question of the extent of variability in the consequences of parenthood.

Of course, as with all analyses based on observational data, estimates may be biased due to unobserved characteristics correlated with parenthood and with the outcome variable; the models assume that the error terms are uncorrelated with the covariates. Prior research on the association between parenthood and work outcomes has often used fixed-effects models to address one form of selection bias (Budig and England, 2001; Gangl and Ziefle, 2009; Glauber, 2007, 2008; Killewald, 2013; Killewald and Gough, 2013; Lundberg and Rose, 2000; Taniguchi, 1999; Waldfogel, 1997). Unlike random-effects models, fixed-effects models account for bias introduced by time-invariant characteristics of individuals associated with both parenthood and the outcome. We estimated equivalent fixed-effects models and found results similar to the estimates from our random-effects models, although there is some evidence of selection into motherhood on the basis of unmeasured time-invariant traits negatively associated with wages: the estimated motherhood penalty is about 4 percentage points larger in the random-effects model than the fixed-effects model (see Table A1 of the appendix).

After estimating the Baseline models for all four outcomes, we turn to the question of how much of the variation across individuals in the wage changes associated with parenthood can be explained by variation in spousal work hours and occupation characteristics, and how much can be explained by variation in the individual's own time use and occupation that is over and above the explanatory power of variation in spousal activity. In these models we include the endogenous mediating variables that we excluded from the Baseline models, simply adding time-varying covariates to Equation (1).

Mediation analysis of this kind—adding endogenous variables to the model to explore how much of the original association is explained—is common in the literature on the motherhood wage penalty and fatherhood wage premium (Budig and England, 2001; Gangl and Ziefle, 2009; Killewald and Gough, 2013; Waldfogel, 1997). Our approach is analytically identical, although our primary interest is not, as in prior research, how much of the average association between parenthood and wages can be explained by the difference between parents and non-parents on these characteristics, but how much of the variation in the motherhood penalty and fatherhood premium can be explained by variation in the mediating factors.

The Spousal model allows spousal paid work, unpaid work, and occupation to mediate the motherhood penalty and fatherhood premium. Housework hours and occupation traits are measured in cross-section, and paid work is measured with the share of full-time worked to date, constructed as previously described. All three mediating variables are lagged to the prior year, to reduce the potential for reverse causality.[10] Conceptually, this approach treats wages as sticky, with wages in the current period affected by prior work behaviors, including accumulated experience, efforts in unpaid labor, and occupational placement. Next, we estimate the Tethered Autonomy model, which allows lagged own as well as lagged spousal time use and occupation to mediate the wage changes associated with parenthood. By comparing the results of the Spousal and Tethered Autonomy models, we estimate the role of individuals' own work behaviors *over and above* the work behaviors of their spouses in explaining variation in post-parenthood wage changes.

Just as omitted variables may threaten causal inference about associations, omitted mediators may threaten inference about the mediating role of a given variable. In the Spousal model, the mediating pathways that operate via own changes in work behavior are deliberately unmeasured, so that the coefficients on spousal work behaviors capture any effects on wages that operate via own work behaviors, as well as any direct effects. Likewise, by measuring only the amount of variation explained by individual work behavior over and above spousal behavior, we set a lower bound on the role of own behavior. Our research question does not depend on partitioning the amount of variation in the motherhood penalty or fatherhood premium due to specific mediating pathways—paid work hours versus unpaid work hours, or these specific work traits versus others—so our results are threatened only if we misattribute which spouse's behavior is responsible for explaining variation in the mother-hood penalty or fatherhood premium, not by whether these *particular* work traits have a specific mediating effect.

We top- and bottom-code the year-specific distributions of housework hours, paid work hours, and wages to the 95th and 1st percentiles, respectively. Descriptive statistics are weighted with annual household-level weights, normalized to average one in each year. A small number of observations with zero weight are omitted from all analyses. Regressions are unweighted. Rates of missing data are low in the PSID, in part due to the PSID's imputations, which we use when available. For education and religion, which change little through adulthood, we impute when necessary with the nearest valid observation, up to three years away. For missing values of age, we impute based on the reported month and year of the individual's birth and, when not available, use the nearest valid report and increment by the number of intervening years. Otherwise, we flag missing values with a dummy variable.[11] Our case counts vary somewhat across outcomes, due to missing data (housework and occupation), the linkage of income and employment data to the previous calendar year (paid work hours and wages), and nonemployment (occupation and wages).

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[10] In the biennial period, housework hours and occupation reported in survey year $t - 1$ are imputed to year t. Therefore, we do not additionally lag these reports. For paid work, during the biennial period we lag two calendar years, because the immediately prior year is not surveyed. We also lag two calendar years in any case that the immediately-prior year is not observed.

[11] Missing rates are higher for lagged variables, since these typically require that the couple was observed in the prior survey wave. Among observations eligible for the wage models, 11 percent are missing data on own share of full-time labor to date, 7 percent are missing on lagged housework hours, and 13 percent are missing on lagged occupation traits.

5. Results

5.1. Sample statistics

Descriptive statistics are shown in Table 1 for the analytic sample used in our wage models, which excludes observations from individuals who did not work for pay at all in the calendar year. The sample includes 11,724 observations from 1443 husbands and 9702 observations from 1413 wives, for an average of about 8.1 observations per husband and 6.9 per wife. The larger numbers of husbands and observations from husbands in the wage sample reflect husbands' lower rates of nonemployment. A total of 1445 unique couples are included in the wage sample. For husbands, 73 percent of their observations are while they are parents, compared to 68 percent for wives.

On all work measures, we see gender gaps both before and after partners' entrance into parenthood, even among those who are employed. Employed husbands earn an average wage of $25.06 per hour when childless, compared to $32.99 when fathers. Of course, some of this difference is because men are, by definition, older when parents than when childless. However, wives' average wages differ less between the childless and parenthood periods: $21.65 and $24.41, respectively.

While childless, employed husbands spend an average of 6.4 h per week in housework, compared to 11.3 h for employed wives. While employed parents, both spouses' average times in housework are higher: 7.6 h per week for fathers and 16.9 for mothers. Thus, on average, employed wives spend more time in housework than employed husbands both when childless and while parents, but the gap is larger following parenthood. In a supplementary analysis (not shown), we find that, if we relax the sample restriction to include those who are not employed, husbands' average housework hours remain stable, but wives' average housework hours are somewhat higher: 11.7 h per week when childless and 18.9 h when mothers.

The same pattern appears in reverse for paid work hours. Pre-parenthood, employed husbands already spend more time, on average, in paid work than their wives: 44.4 h per week, compared to 34.7 h for employed wives. Employed fathers and childless men differ little in their average paid work hours (45.2 h per week versus 44.4), but employed mothers' average weekly paid work hours are about 5 h less than employed childless women's (29.8 h versus 34.7 h). When nonemployed individuals are included, husbands' average hours are about 44 h per week both when fathers and when childless, while wives average 32.5 h per week when childless and 22.0 h per week when mothers.

Wives tend to work in occupations with more part-time work than husbands do, and differences by parental status are modest. While childless, husbands work in occupations with 12.6 percent of workers part-time, compared to 11.1 percent while fathers. For wives, the analogous numbers are 20.3 percent and 21.2 percent.

Spouses are in their low to mid-30s, on average. Only 3–4 percent of individuals in the weighted sample are non-Hispanic black and only 5 percent are Hispanic. This divergence from the national population is due to several factors. First, only married and long-term coresidential couples making the first transition to parenthood together are included in the sample. Since both nonmarital births and multiple partner fertility are most common among African Americans, followed by Hispanics, followed by whites (Guzzo and Furstenberg, 2007, Martin et al., 2015), this restriction disproportionately excludes non-white sample members. The low representation of Hispanics in the sample also reflects that the PSID sample is based largely on the original 1968 sample, their descendants, and the spouses of their descendants, so it does not capture much of the growth of the Hispanic population after 1968. The immigrant sample partially corrects this underrepresentation since 1997.

5.2. Models of housework time, paid labor time, and percent part-time in occupation

Table 2 shows the results of random-slopes models of spouses' housework hours, paid work hours, and percent part-time in the individual's occupation. The first column shows the results for housework time. On average, wives spend 6.4 h more in housework per week when mothers than while childless, all else equal. Husbands also spend more time in housework when they are fathers, but the difference is only 1.0 h per week. Parenthood thus compounds gender differences in housework time already present among childless couples. Unlike prior research, our approach allows us to describe not only average changes, but population variability in the changes following parenthood. The standard deviation of the change in wives' housework hours post-parenthood is 5.6 h, compared to 2.1 h for husbands. This confirms that there is greater variability in wives' housework responses to parenthood than husbands', as predicted by tethered autonomy. The between-spouse correlation in the random effects is 0.29 and is statistically distinguishable from zero. Thus, for housework, spouses' behaviors are characterized by complementarity: wives who increase their housework time more than other women when they become mothers tend to be partnered to men who do the same compared to other husbands.

The second column shows the results for paid work time. Holding other factors constant, parenthood is associated with an average decline in wives' paid work time of 10.0 h per week and no statistically significant change in husbands' paid work time. The husbands in our sample are already averaging 44 h per week of paid labor prior to becoming fathers, so it is perhaps not surprising that their time does not further increase following parenthood. Again, parenthood increases pre-existing gender gaps in time use. Similar to the results for housework hours, there is less variability among husbands than among wives in changes in paid work hours after becoming parents (standard deviations of 3.4 and 11.4, respectively). Again, these results are consistent with the predictions of tethered autonomy: husbands' paid work hours are high both before and after becoming fathers, change little on average between childlessness and parenthood, and the changes following parenthood are less variable for husbands than wives. For paid labor, spouses' time use changes are negatively correlated (−0.29) and

Table 1
Weighted sample means (standard deviations), by sex. Individuals ages 18–60 with valid hourly wages, neither partner enrolled in school. PSID.

	Husbands	Wives
Person-year		
Parent	0.73	0.68
Hourly wage (2012$)		
Childless	$25.06 ($13.20)	$21.65 ($12.36)
Parent	$32.99 ($17.97)	$24.41 ($16.56)
Weekly housework hours		
Childless	6.43 (5.57)	11.31 (6.82)
Parent	7.64 (6.35)	16.87 (9.30)
Weekly paid work hours		
Childless	44.41 (9.76)	34.68 (12.20)
Parent	45.20 (10.16)	29.77 (14.47)
Percent part-time in occupation		
Childless	12.55 (10.11)	20.25 (12.92)
Parent	11.05 (8.94)	21.20 (13.66)
Age	34.33 (7.10)	32.57 (7.12)
Health limitation	0.05	0.05
Fair/poor health	0.02	0.02
Region		
Northeast	0.25	0.25
North Central	0.26	0.27
South	0.29	0.28
West	0.19	0.19
Foreign	0.01	0.01
Religion		
Christian, not Catholic	0.53	0.56
Catholic	0.31	0.30
Other	0.06	0.06
None	0.10	0.08
Education		
Less than high school	0.05	0.02
High school graduate	0.27	0.25
Some college	0.24	0.28
Bachelor's degree	0.45	0.44
Observations	11,724	9702
Individual		
Race		
White	0.89	0.89
Black	0.04	0.03
Hispanic	0.05	0.05
Other	0.02	0.03
Individuals	1443	1413

statistically distinguishable from zero, suggesting a tendency for husbands with larger increases in paid labor time after becoming fathers to be partnered to wives with larger decreases in paid labor time at motherhood—a tradeoffs pattern. This is consistent with prior research suggesting between-spouse tradeoffs on paid work time (Cha, 2010; Lundberg and Rose, 2000).

Net of covariates, motherhood is associated with an average increase of 3.2 percentage points in the percent of part-time workers in wives' occupations, while fatherhood is associated with a decline of 0.7 percentage points; parenthood widens the between-partner gap in occupational sex composition, just as it widens the gap in time use. Just as for the time use outcomes, wives' occupation adjustments following motherhood are more variable than husbands' adjustments following fatherhood (standard deviations of 8.4 and 4.2, respectively), again consistent with the expectations of tethered autonomy. Changes in this aspect of spouses' occupations are complementary, correlated at 0.18 and statistically distinguishable from zero; wives who make the biggest moves toward part-time occupations following motherhood tend to be partnered to men who also make adjustments toward occupations with more part-time workers (or at least smaller moves away from such occupations). Similar analyses, shown in the Online Supplement, revealed that motherhood is associated with increases in the percent of women in wives' occupations and declines in the percent engaged in overwork in their occupations, while fatherhood is associated with increases in the percent engaged in overwork and no statistically significant change in percent female. Both outcomes are positively correlated between partners (0.14 for percent female and 0.15 for percent overwork).

In sum, our results confirm prior evidence that the average effects of parenthood are gendered and that average changes in wives' work behaviors are larger than husbands'. We extend prior research by documenting substantially greater variability among wives in changes at parenthood, while husbands' responses to fatherhood fall over a narrower range. We further find that spouses' changes in housework time and occupation traits are positively correlated, suggesting that spouses' accommodations to parenthood are complementary on these dimensions of work behavior. In other words, for these dimensions, spouses' responses to parenthood are more similar to one another than between a randomly chosen married man and

Table 2

Coefficients (standard errors) from random-slopes models predicting weekly hours of housework and paid work and percent employed part-time in the individual's occupation. Individuals ages 18–60, neither partner enrolled in school. PSID.

	Housework time	Paid work time	Percent part-time
Mother	6.36*** (0.23)	−9.99*** (0.44)	3.21*** (0.36)
Father	0.95*** (0.18)	0.08 (0.31)	−0.74** (0.27)
Sd (Mother)	5.62 (0.18)	11.43 (0.32)	8.42 (0.28)
Sd (Father)	2.06 (0.21)	3.35 (0.37)	4.20 (0.25)
Corr (Father, Mother)	0.29 (0.08)	−0.29 (0.09)	0.18 (0.06)
N (couples)	1451	1448	1450
N (observations)	25,103	24,500	21,770

*p < .05; **p < .01; ***p < .001.
Note: All models include time-varying controls for education, a quadratic in age, age-education interactions, religion, region, health limitations and general health, and the year. All models also include a time-invariant control for race. Sex of the individual is allowed to moderate all associations. Percent part-time is measured 0–100. See text for details of each model specification.

married woman. However, spouses' changes in paid work hours following parenthood are negatively correlated, suggesting tradeoffs between partnered parents: spouses' responses are more disparate than expected by random chance. The fact that the correlations are in different directions for different aspects of work behavior suggests that different aspects of work—paid and unpaid, hours and occupation—may follow different couple-level logics.

5.3. Baseline wage model

Table 3 presents the results of the wage models. The first column displays the results from the Baseline model, which follows the same specification as the housework, paid work, and occupation trait models. Married motherhood is associated with wage losses of about 12.7 ($1 − e^{-0.136} = 0.127$) percent, while married fatherhood is associated with a premium of 3.5 ($e^{0.034} − 1 = 0.035$) percent, resulting in a wider average gender gap in wages for partnered parents than for childless couples. Again, variability in changes is larger for mothers (0.336) than for fathers (0.225). Within couples, spouses' wage changes are positively correlated (0.09), suggesting complementarity in spouses' wage consequences of parenthood, although the association is not statistically distinguishable from zero. Thus, there is no evidence that husbands who experience the largest fatherhood premiums do so only because their wives experience larger than average motherhood penalties.[12]

5.4. Spousal model

Having established the extent of variability within each sex and the associations between partners in changes in work behaviors and wages after becoming parents, we turn to exploring how important variation in own and spousal work behaviors is for variation in the motherhood penalty and fatherhood premium. Recall that a tradeoffs perspective suggests that an individual's wages benefit when his/her spouse invests more in unpaid labor and less in paid labor, since it allows the individual to devote less effort to unpaid labor and more to paid labor, increasing wages. The results of the Spousal model are shown in the second column of Table 3. Consistent with prior research, husbands' wages are higher when their wives invest less in paid labor (Chun and Lee, 2001; Glauber, 2008; Gray, 1997). Compared to husbands whose wives have been consistently not employed, husbands whose wives have been consistently employed full-time are predicted to have about 6.7 percent lower wages. The negative association between husbands' share of full-time employment to date and wives' wages is identical in magnitude, although it is not statistically significant. For housework hours and percent part-time in the occupation, there is no statistically significant association with spouse's wages, for either partner.

The fact that individuals' wages do not benefit from greater spousal housework hours and greater percent part-time in spouses' occupations is not surprising in light of the between-spouse complementarity in these two domains we found in Table 2; there is no evidence that greater investments in unpaid labor and shifts to occupations with more part-time labor by one partner facilitate wage-enhancing shifts in the opposite direction by the other partner. On the other hand, given that Table 2 did show between-partner tradeoffs on paid labor time, it is reasonable that we find, at least for husbands, that individuals' wages benefit when their partners devote less effort to paid labor, presumably in part because it allows the other partner to devote more effort in this area.

Given that motherhood is associated with declines in wives' paid work hours and that husbands benefit from reductions in their wives' paid labor market effort, it is unsurprising that spousal work experience mediates a portion of the fatherhood wage premium, reducing it to 1.1 percent and rendering it not statistically significant; men have higher wages when fathers than when childless in part because their wives spend less time in paid labor when they are mothers. However, because

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[12] The between-spouse correlation in post-parenthood changes in log annual earnings is −0.23, falling between the between-spouse correlations in paid work hours changes and wage changes.

Table 3

Coefficients (standard errors) from random-slopes models predicting Ln(hourly wage). Individuals ages 18–60, neither partner enrolled in school. PSID.

	Baseline	Spousal	Tethered autonomy
Mother	−0.136*** (0.016)	−0.157*** (0.017)	−0.035* (0.016)
Father	0.034* (0.013)	0.011 (0.014)	0.017 (0.014)
Women			
Spouse (lagged traits)			
Share of FT to date		−0.069 (0.060)	−0.014 (0.058)
Housework hours		0.001 (0.001)	0.003** (0.001)
Share part-time in occupation		0.104 (0.059)	0.089 (0.058)
Self (lagged traits)			
Share of FT to date			0.520*** (0.033)
Housework hours			−0.005*** (0.001)
Share part-time in occupation			−0.451*** (0.043)
Men			
Spouse (lagged traits)			
Share of FT to date		−0.069* (0.028)	−0.032 (0.028)
Housework hours		0.001 (0.001)	0.001 (0.001)
Share part-time in occupation		−0.020 (0.040)	−0.025 (0.039)
Self (lagged traits)			
Share of FT to date			0.618*** (0.054)
Housework hours			−0.001 (0.001)
Share part-time in occupation			−0.269*** (0.053)
Sd (Mother)	0.336 (0.013)	0.334 (0.013)	0.268 (0.013)
% Baseline variance explained		1.2%	36.1%
Sd (Father)	0.225 (0.011)	0.221 (0.012)	0.222 (0.011)
% Baseline variance explained		3.3%	2.1%
Corr (Father, Mother)	0.09 (0.06)	0.15 (0.07)	0.24 (0.07)
N (couples)	1445	1445	1445
N (observations)	21,426	21,426	21,426

Note: All models include time-varying controls for education, a quadratic in age, age-education interactions, religion, region, health limitations and general health, and the year. All models also include a time-invariant control for race. Sex of the individual is allowed to moderate all associations. Share variables range from 0 to 1. See text for details of each model specification.

fatherhood is not associated with substantial changes in husbands' paid labor time, husbands' work experience does not mediate the motherhood penalty. In fact, the coefficient increases in magnitude somewhat rather than decreasing.

Our models provide insight not only about the average mediating role of spousal work behaviors, but about how variation in spousal behaviors contributes to within-sex variability in the motherhood penalty and fatherhood premium. For example, even if, on average, the motherhood penalty is not mediated by husbands' work behaviors, does variation in husbands' behaviors help to explain why the motherhood penalty is more severe for some partnered women than for others? To compute the share of the total variation in the motherhood penalty and fatherhood premium explained by variation in the time use and occupation of spouses, we compare the variance (the square of the standard deviation) of the parenthood random-slope terms in the Baseline model and the Spousal model. Spousal work behaviors explain an extremely modest share of the total cross-couple variation—just 1 percent of the variation in the motherhood penalty and 3 percent of the variation in the fatherhood premium. Thus, although wives' paid work effort is a statistically significant determinant of their husbands' wages and partially mediates the fatherhood premium, variation across wives in paid labor effort explains little of the variation in husbands' realized fatherhood premiums, and husbands' work behaviors explain even less of the variability in the motherhood penalty.

5.5. Tethered autonomy model

The results of the Tethered Autonomy model, which allows both own and spousal time use and occupation to mediate the motherhood penalty and fatherhood premium, are shown in the third column of Table 3. Consistent with expectations, both spouses have higher wages when they have been employed closer to full-time since partnering and when they work in occupations with a lower percentage of part-time workers. For both spouses, compared to consistent full-time employment, being employed 90 percent of full-time since partnering is associated with about 5–6 percent lower predicted wages, and working in an occupation that has 10 percentage points more part-time workers is associated with predicted wages about 3–4 percent lower.

For wives, more time in housework is statistically significantly associated with lower wages, with a ten hour increase in weekly housework time associated with a predicted decline in wages of 5 percent. For men, variation in housework time is not statistically significantly associated with wages, and the point estimate is close to zero. The lack of clear association between men's housework time and their wages is consistent with prior research, at least when all types of housework are grouped together (Hersch and Stratton, 1997; Noonan, 2001).

Controlling for own work behaviors reduces the magnitude of the association between wives' paid work and husbands' wages by more than 50 percent and renders it not statistically significant. This is consistent with wives' reduced paid work

efforts improving husbands' wages by allowing husbands to spend more time in paid labor. Notably, however, there is no evidence that this mediational chain operates via between-partner tradeoffs in *housework* time, because, as shown in Table 2, spouses' housework responses to parenthood are complementary. In the Spousal model, an increase in husbands' housework hours is offset by the fact that wives' housework hours also increase (complementarity), reducing her wages. However, if we hold constant wives' own housework hours, as in the Tethered Autonomy model, husbands' additional housework time is beneficial for wives' wages.

Own work behaviors substantially mediate the average motherhood penalty, which falls from 12.7% in the Baseline model to 3.4% in the Tethered Autonomy model. Three variables—share of full-time to date, weekly housework hours, and share part-time in the occupation—together explain about three-quarters of the average motherhood penalty. Far more of the variation in the motherhood penalty is also explained by variation in own time use and occupation changes post-parenthood than was explained by changes in husbands' time use and occupation, again consistent with the tethered autonomy perspective. Variation in husbands' paid and unpaid work behaviors explains only 1 percent of the variation in the motherhood penalty (Spousal model), compared to 36 percent in the model that adds variation in women's own work behaviors (Tethered Autonomy model). Thus, work behaviors explain not only wage differences between mothers and childless women, but also variation among women in the size of the motherhood penalty. For men, including both own and spousal work behaviors explains only 2 percent of the variation in the fatherhood premium and does not further mediate the average fatherhood premium, which rises slightly to 1.7 percent (not statistically significant).

In supplemental models, we allowed the percent of workers engaged in overwork (more than 50 h per week) and the percent of workers who are female in both spouses' occupations to enter the model as well. However, these additional occupation traits have very modest additional explanatory power—less than an additional 0.2 percent of the variation explained for either fathers or mothers in either the Spousal or Tethered Autonomy model. It is for this reason that we focus on the role of percent part-time within occupations in the main results.

Given the large share of the average motherhood penalty and its variation explained by women's own work behaviors, it is reasonable to ask which of the three types of behaviors—housework time, paid work time, or occupation traits—has the most explanatory power, if only descriptively. We repeated the Tethered Autonomy model but considered each of these mediating variables (for both self and spouse) one at a time. Percent of full-time work alone explains 56 percent of the average motherhood penalty and 27 percent of the variation in the motherhood penalty. In other words, differences between mothers and non-mothers in household paid work patterns explain over half of the motherhood penalty compared to childless women, and variation among mothers in how much they and their spouses adjust their paid work explains over one-quarter of the variation in the motherhood penalty among mothers. Housework time explains 24 percent of the average motherhood penalty and 13 percent of its variation. Percent part-time in the occupation explains 20 percent of the average motherhood penalty and 20 percent of its variation. These results are consistent with prior evidence of the importance of labor market experience in shaping mothers' wage outcomes (Budig and England, 2001; Gangl and Ziefle, 2009; Killewald and Gough, 2013). However, our results also reveal that adding housework and occupation to the paid work-only model increases the fraction of the average motherhood penalty explained from 56 percent to 74 percent and the fraction of the variation in the motherhood penalty explained from 27 percent to 36 percent, illustrating that work behaviors other than paid work hours also influence the motherhood penalty.

6. Robustness checks and limitations

We performed a wide variety of supplementary analyses to confirm the robustness of our results. We discuss these analyses briefly here, with additional discussion and documentation in the Online Supplement. To test whether our results are unique to the subsample of couples making the transition to first-time parenthood together, we repeated our analyses on all couples observed with minor children in the household. The results are consistent with our main sample across all three research questions, and the results for the Baseline models of all four outcomes are shown in Table A2.

Our measure of unpaid labor time does not explicitly include child care time. This may lead us to overstate the complementarity of spouses' changes in unpaid work hours after becoming parents, if time in child care is more strongly negatively correlated between partners than time in housework. As previously mentioned, the fact that, on average, partnered Australian fathers spend only 13 percent of their child care time as the sole parent (Craig, 2006) casts doubt on this interpretation. Using cross-sectional data from the time diary component of the Child Development Supplement (CDS) to the PSID, we found positive between-partner associations in child care time.

Another possible source of bias is our treatment of nonemployed spouses, who were excluded from the wage analyses because they have no wage. We may have understated between-spouse wage tradeoffs by disproportionately excluding couples with the most extreme division of labor. We replicated our wage models imputing a variety of wage values for spouses not employed in a given calendar year. When very different strategies are used for imputing the wages of non-employed wives versus nonemployed husbands, the estimated between-spouse correlation in the wage consequences of parenthood is slightly negative (no stronger than −0.06). When more similar imputation strategies are used for both spouses, the between-spouse correlations are positive.

We considered additional potential moderators of the motherhood wage penalty and fatherhood wage premium, including region, religion, health, age at first birth, education, race, child's sex, child's low birthweight status, and child's birth cohort. We also allowed our mediating work variables, including all three occupation traits, to moderate as well as mediate

the association between parenthood and wages. These characteristics jointly explained very little additional variation in the motherhood penalty and fatherhood premium, net of work characteristics; we are able to explain 5 percent of the variation in the fatherhood premium and 37 percent of the variation in the motherhood penalty.

Finally, we performed two supplementary analyses to adjust for potential effects of subsequent children on parents' work behaviors. First, we included controls for the total number of children in the household and whether the youngest child is under the age of five. Second, we modeled parenthood with number of children in the household rather than a dummy variable. Again, our results were consistent with those presented in the main analyses: there is more variability in mothers' responses than fathers', and the between-partner correlation in changes is positive for housework hours, percent part-time in the occupation, and wages and negative for paid work hours.

A limitation of our analysis is that we have insufficient statistical power to estimate subgroup-specific models, such as by race or education. More research, both qualitative and quantitative, is needed to understand variation across subgroups in logics of trading off, complementarity, and independence. We are likewise not able to estimate separate models for cohabitors versus those who are married. As cohabitation becomes increasingly common, future research will be able to explore in more detail how partners' joint strategies for combining work and parenthood vary by marital status.

Our analyses, like all evaluations of the effect of parenthood on work hours, job traits, or wages based on observational data, are subject to limitations of causal inference. With respect to the average associations between parenthood and outcomes, we confirm the robustness of our random-effects results with fixed-effects models. Our key parameters of interest, however, are not average associations, but the extent of variability in the responses to parenthood among husbands versus wives, how partners' responses to parenthood are associated, and the relative importance of spousal versus own work behaviors in explaining variation in the motherhood penalty and fatherhood premium. So, specification error that threatens our results must affect these parameters.

The relative importance of variation in spousal behaviors may be understated if there are unmeasured spousal actions that mediate the relationship between parenthood and own wages and these mediators are not highly correlated with the mediators that we have already considered. We guarded against this possibility by considering a range of behaviors, including both time use and job traits and measures of activity at home and work. Furthermore, by including the spouse's behaviors first in the models, we deliberately attribute to variation in the spouse's behaviors correlated mediating channels that operate through own characteristics.

7. Conclusion

The study of the association between parenthood and wages is a mature field: many scholars have sought to estimate the magnitude of the motherhood penalty or fatherhood premium and to determine its causes. Yet this rich literature has been almost exclusively focused at the individual level. This is appropriate when the key outcome of interest is within-sex differences in outcomes based on parenthood status. If the between-sex difference in the effect of family on individuals' outcomes is of interest, individual-level models with interactions by sex can provide insight. Both styles of individual-level analysis are especially appropriate when the focus is on workplace factors that affect the labor market costs of parenthood, including discrimination. In terms of individual-level, average effects, our results are consistent with prior research showing that the work consequences of parenthood are deeply gendered. Transitions to partnered motherhood are associated with declines in paid work time, increases in housework time, moves to more heavily part-time occupations, and wage penalties, while transitions to partnered fatherhood are associated with only slight increases in housework, no significant change in paid work, moves to less heavily part-time jobs, and wage premiums. Even if partners consult one another in deciding how they will each adjust their work behaviors after the birth of a child, it is mothers who bear the costs of these adjustments in the marketplace.

But individual-level models are less appropriate for developing and testing theories about how partners' experiences are interrelated. We showed that, while partners' changes in paid labor time following the transition to parenthood are characterized by tradeoffs, changes in their housework time, occupation traits, and wages are all characterized by complementarity: they are positively rather than negatively associated. These patterns do not negate average gender differences in the consequences of parenthood, but they reveal that partners are not always engaged in zero-sum adjustments and that the interrelationship between partners' post-parenthood work adjustments may be different for different work domains. Average effects characterize typical between-gender variation, whereas our analysis of within-couple associations describes whether partners' responses to parenthood are more similar to or different from one another than from a randomly-chosen partner of the other sex. More research is needed to understand the circumstances and types of work behavior for which spouses employ trading off versus complementarity.

A limitation of our analyses is that we cannot identify how between-spouse decision-making looks "on the ground." We do not know whether husbands' near-universal full-time employment is a signal of their privileged position within the couple, as they secure more desirable labor and benefit from the relative compatibility of the father and employee roles, or whether it is an undesired result of strict gender norms that stigmatize less than full-time employment for married men. Likewise, the greater variability in wives' work adjustments following motherhood may reflect greater work-family conflict for mothers that leads to heterogeneity in mothers' strategies and success in managing this conflict, or it may reveal that mothers have somewhat greater flexibility than fathers in how to combine work and family. In other words, the results may be interpreted to emphasize either the "hard" or the "choices" aspect of married mothers' position. It is likely that both processes are at work

and to different degrees for different couples. Future work, particularly using qualitative methods, is needed to better understand how couples arrive at their work adjustments to parenthood and how satisfied each partner is with the outcomes.

After documenting between-partner associations in work changes following parenthood, we draw on and extend the autonomy perspective from the household labor literature to propose that variability in partners' work responses to parenthood can be characterized by *tethered autonomy.* We hypothesized that husbands are near-universally employed full-time, both when childless and as fathers, while wives have greater variability in how they combine employment and parenthood. As expected, we find that husbands' paid work hours are high both before and after the transition to fatherhood, do not change statistically significantly following the transition to fatherhood, and have little between-man variability in the extent of these changes. In fact, for each outcome examined—housework time, paid work time, percent part-time in the occupation, and wages—wives' changes are both larger on average than husbands' and have greater variability in the population. Consistent with tethered autonomy, we find that, in terms of work behaviors, men act largely as a fixed point, with changes at parenthood and variation among parents concentrated among women.

These two findings—the small variation in husbands' work responses to fatherhood and the complementarity of spouses' responses in housework hours and occupation traits—foreshadow our subsequent findings: variability in spousal behavior explains very little of the variation in the motherhood penalty and fatherhood premium—at most 3 percent. While our results are consistent with prior research that has found higher wages for men when their wives spend less time in paid labor (Chun and Lee, 2001; Glauber, 2008; Gray, 1997), we show that variation in wives' paid work efforts explain little of the variation in the fatherhood premium. Furthermore, there is no evidence that a wife's withdrawal from paid labor benefits her husband's wages by increasing her household labor and reducing his—the traditional causal chain used to link wives' paid labor efforts to husbands' wages; spouses' housework changes are positively correlated, and men's housework hours are not a significant predictor of their wages.

The largest predictors of variation in the motherhood wage penalty are variations across wives in their own paid work time, unpaid work time, and occupation traits, net of variation in their husbands' behaviors. These same factors that explain variation among mothers in the magnitude of the motherhood penalty are also, unsurprisingly, major mediators of the average motherhood penalty; together, differences between mothers and childless women on these three traits explain three-quarters of the average motherhood wage penalty. Thus, wives' wage outcomes are *tethered* to their husbands—a reallocation of labor between partners would reduce the motherhood penalty, if it reduced mothers' housework time, increased their paid work hours, and shifted mothers to different occupations—but most of the variability across women in the motherhood penalty is due to *autonomy*—variation in own behavior above and beyond any effect of the behaviors of their husbands.

Given these results, does a couple-level perspective add anything to the study of the work-family intersection? In some ways, single-sex models of the motherhood penalty and fatherhood premium do not miss much, since individual work behaviors are far more important than spousal behaviors in determining individuals' wages and wage consequences of parenthood. However, our results challenge scholars using individual-level models not to assume without evidence that the large average gender gaps in the consequences of parenthood for work behaviors and wages are due to tradeoffs between spouses on these outcomes, since our results question this underlying theoretical claim.

The factors we examined explain very little of the variation in the fatherhood premium. It is possible that variation in the estimated fatherhood premium across men is due to random variation and measurement error, or to variation in the extent of employer discrimination in favor of fathers. Variation in discrimination could also explain some of the variation in the motherhood penalty, but perhaps it comprises a larger share of fathers' (relatively smaller) variation. If this variation were highly correlated with demographic traits, such as employers discriminating in favor of white or more educated fathers, but not other fathers, then we would expect to see it reflected in our models that included demographic traits as additional moderators of the wage consequences of parenthood. Instead, we found that these traits explained little additional variation in the motherhood penalty and fatherhood premium. Alternatively, some fathers may be particularly invested in the male breadwinner ideology and seek to increase their wages, while others may prioritize other fatherhood roles and experience smaller fatherhood premiums. However, in this case it is surprising that fathers' work behaviors explain so little of the variation in the fatherhood premium, extending previously-considered sources of variation such as race, marital status, occupation type, and education (Glauber, 2008; Hodges and Budig, 2010; Killewald, 2013).

Methodologically, our findings highlight the advantage of random-slopes models for the investigation of moderating relationships. When evaluating the role of moderating variables, social scientists often examine only statistical significance, leaving unexplored how well our model explains between-individual variation in slopes. By using random-slopes models, we show that much of the variation in both the motherhood penalty and the fatherhood premium remains unexplained, even after accounting for changes in work behaviors by both spouses and a host of demographic characteristics. Understanding the other contributors to this variation (including, of course, measurement error) is another productive avenue for future research. For example, if variation in employer discrimination is responsible, then firm-level or additional occupation-level characteristics may moderate the motherhood penalty and fatherhood premium and explain a portion of the residual variation from our models.

In this paper, we respond to the long-standing call in sociology to consider partners' behaviors as interrelated and to document and seek to explain the wide variety of ways in which contemporary American couples experience the work-family intersection. Perhaps unsurprisingly, we find that couple-level variation is predominantly variation between wives. Furthermore, simply increasing husbands' housework time does not necessarily reduce wives' burden, as spouses' exhibit

complementarity on housework adjustments to parenthood. Our findings suggest caution in assuming that reductions in gender inequality in the consequences of parenthood can be achieved solely by changing husbands' participation in home production, without also altering the effect of his housework on her housework and wages.

Acknowledgments

Appendices

Table A1
Coefficients (standard errors) from person-level fixed-effects models predicting weekly hours of housework and paid work, percent employed part-time in the individual's occupation, and Ln(hourly wage). Individuals ages 18—60, neither partner enrolled in school. PSID.

	Housework	Paid work	Percent part-time	Ln(Hourly wage)
Women				
Mother	5.78*** (0.22)	−9.19*** (0.40)	2.47*** (0.36)	−0.091*** (0.016)
R^2-within	0.13	0.11	0.03	0.05
N (individuals)	1451	1448	1422	1413
N (observations)	12,535	12,250	9686	9702
Men				
Father	1.16*** (0.16)	−0.17 (0.27)	−0.52* (0.22)	0.026* (0.012)
R^2-within	0.01	0.03	0.02	0.16
N (individuals)	1451	1448	1445	1443
N (observations)	12,568	12,250	12,084	11,724

*p < .05; **p < .01; ***p < .001.
Note: Models are sex-specific. All models include time-varying controls for education, a quadratic in age, age-education interactions, religion, region, health limitations and general health, and the year. Percent part-time is measured 0—100. See text for details of each model specification.

Table A2
Coefficients (standard errors) from random-slopes models predicting weekly hours of housework and paid work, percent employed part-time in the individual's occupation, and Ln(hourly wage). Individuals ages 18—50, neither partner enrolled in school. Includes couples who did not transition to parenthood together. PSID.

	Housework time	Paid work time	Percent part-time	Ln(hourly wage)
Mother	7.24*** (0.17)	−9.90*** (0.29)	3.08*** (0.25)	−0.156*** (0.012)
Father	1.14*** (0.14)	−0.12 (0.24)	−0.83*** (0.20)	0.002 (0.010)
Sd (Mother)	6.05 (0.15)	10.14 (0.23)	8.51 (0.22)	0.309 (0.011)
Sd (Father)	0.85 (0.52)	2.52 (0.49)	4.22 (0.21)	0.204 (0.011)
Corr (Father, Mother)	0.30 (0.26)	−0.20 (0.11)	0.25 (0.05)	0.20 (0.06)
N (couples)	8266	7981	8140	7825
N (observations)	97,507	94,426	81,244	79,676

*p < .05; **p < .01; ***p < .001.
Note: All models include time-varying controls for education, a quadratic in age, age-education interactions, religion, region, health limitations and general health, and the year. All models also include a time-invariant control for race. Sex of the individual is allowed to moderate all associations. Percent part-time is measured 0—100. See text for details of each model specification. The Spousal model explains 0.6% of the variation in the motherhood penalty and 1.9% of the variation in the fatherhood premium. The Tethered Autonomy model explains 35.0% of the variation in the motherhood penalty and −2.2% of the variation in the fatherhood premium.

Appendix A. Supplementary data

Supplementary data related to this article can be found at http://dx.doi.org/10.1016/j.ssresearch.2016.03.007.

References

Anderson, Deborah J., Binder, Melissa, Krause, Kate, 2003. The motherhood wage penalty revisited: experience, heterogeneity, work effort, and work-schedule flexibility. Ind. Labor Relat. Rev. 56 (2), 273–294.

Becker, Gary S., 1991. A Treatise on the Family. Enl. ed. Harvard University Press, Cambridge, MA.

Becker, Penny Edgell, Moen, Phyllis, 1999. Scaling back: dual-earner couples' work-family strategies. J. Marriage Fam. 61 (4), 995–1007.

Berk, Sarah Fenstermaker, 1985. The Gender Factory: the Apportionment of Work in American Households. Plenum, New York.

Blair-Loy, Mary, 2003. Competing Devotions: Career and Family Among Women Executives. Harvard University Press, Cambridge, MA.

Blau, Francine D., Kahn, Lawrence M., 2007. Changes in the labor supply behavior of married women: 1980–2000. J. Labor Econ. 25 (3), 393–438.

Budig, Michelle J., England, Paula, 2001. The wage penalty for motherhood. Am. Sociol. Rev. 66 (2), 204–225.

Budig, Michelle J., Hodges, Melissa J., 2010. Differences in disadvantage: variation in the motherhood penalty across White women's earnings distribution. Am. Sociol. Rev. 75 (5), 705–728.

Cha, Youngjoo, 2010. Reinforcing separate spheres: the effect of spousal overwork on men's and women's employment in dual-earner households. Am. Sociol. Rev. 75 (2), 303–329.

Chun, Hyunbae, Lee, Injae, 2001. Why do married men earn more: productivity or marriage selection? Econ. Inq. 39 (2), 307–319.

Correll, Shelley J., Benard, Stephen, Paik, In, 2007. Getting a job: is there a motherhood penalty? Am. J. Sociol. 112 (5), 1297–1338.

Craig, Lyn, 2006. Does father care mean fathers share? A comparison of how mothers and fathers in intact families spend time with children. Gend. Soc. 20 (2), 259–281.

D'Amico, Ronald, 1983. Status maintenance or status competition? Wife's relative wages as a determinant of labor supply and marital instability. Soc. Forces 61 (4), 1186–1205.

Forste, Renata, Bartkowski, John P., Jackson, Rebecca Allen, 2009. 'Just be there for them': perceptions of fathering among single, low-income men. Fathering 7 (1), 49–69.

Gangl, Markus, Ziefle, Andrea, 2009. Motherhood, labor force behavior, and women's careers: an empirical assessment of the wage penalty for motherhood in Britain, Germany, and the United States. Demography 46 (2), 341–369.

Gerson, Kathleen, 1985. Hard Choices: How Women Decide About Work, Career, and Motherhood. University of California Press, Berkeley, CA.

Glauber, Rebecca, 2007. Marriage and the motherhood wage penalty among African Americans, Hispanics, and Whites. J. Marriage Fam. 69 (4), 951–961.

Glauber, Rebecca, 2008. Race and gender in families and at work: the fatherhood wage premium. Gend. Soc. 22 (1), 8–30.

Gray, Jeffrey S., 1997. The fall in men's return to marriage: declining productivity effects or changing selection? J. Hum. Resour. 32 (3), 481–504.

Gupta, Sanjiv, 2006. Her money, her time: women's earnings and their housework hours. Soc. Sci. Res. 35 (4), 975–999.

Gupta, Sanjiv, 2007. Autonomy, dependence, or display? The relationship between married women's earnings and housework. J. Marriage Fam. 69 (2), 399–417.

Guzzo, Karen Benjamin, Furstenberg Jr., Frank F., 2007. Multipartnered fertility among American men. Demography 44 (3), 583–601.

Hays, Sharon, 1996. The Cultural Contradictions of Motherhood. Yale University Press, New Haven, CT.

Heckman, James J., Lochner, Lance J., Todd, Petra E., 2006. Earnings functions, rates of return and treatment effects: the Mincer equation and beyond. In: Hanushek, Eric A., Welch, Finis (Eds.), Handbook of the Economics of Education, vol. 1. North-Holland, Amsterdam, pp. 307–458.

Hersch, Joni, Stratton, Leslie S., 1997. Housework, fixed effects, and wages of married workers. J. Hum. Resour. 32 (2), 285–307.

Hochschild, Arlie, 1989. The Second Shift: Working Parents and the Revolution at Home. Viking Penguin, New York.

Hodges, Melissa J., Budig, Michelle J., 2010. Who gets the daddy bonus? Organizational hegemonic masculinity and the impact of fatherhood on earnings. Gend. Soc. 24 (6), 717–745.

Kahn, Joan R., García-Manglano, Javier, Bianchi, Suzanne M., 2014. The motherhood penalty at midlife: long-term effects of children on women's careers. J. Marriage Fam. 76 (1), 56–72.

Kaufman, Gayle, Uhlenberg, Peter, 2000. The influence of parenthood on the work effort of married men and women. Soc. Forces 78 (3), 931–947.

Killewald, Alexandra, 2011. Opting out and buying out: wives' earnings and housework time. J. Marriage Fam. 73 (2), 459–471.

Killewald, Alexandra, 2013. A reconsideration of the fatherhood premium: marriage, coresidence, biology, and fathers' wages. Am. Sociol. Rev. 78 (1), 96–116.

Killewald, Alexandra, Gough, Margaret, 2013. Does specialization explain marriage penalties and premiums? Am. Sociol. Rev. 78 (3), 477–502.

Killewald, Alexandra, Bearak, Jonathan, 2014. Is the motherhood penalty larger for low-wage women? A comment on quantile regression. Am. Sociol. Rev. 79 (2), 350–357.

Kühhirt, Michael, Ludwig, Volker, 2012. Domestic work and the wage penalty for motherhood in West Germany. J. Marriage Fam. 74 (1), 186–200.

Lundberg, Shelly, Pollak, Robert A., 1993. Separate spheres bargaining and the marriage market. J. Polit. Econ. 101 (6), 988–1010.

Lundberg, Shelly, Rose, Elaina, 2000. Parenthood and the earnings of married men and women. Labour Econ. 7 (6), 689–710.

Manser, Marilyn, Brown, Murray, 1980. Marriage and household decision-making: a bargaining analysis. Int. Econ. Rev. 21 (1), 31–44.

Martin, Joyce A., Hamilton, Brady E., Osterman, Michelle J.K., Curtin, Sally C., Mathews, T.J., 2015. Births: Final Data for 2013. National Vital Statistics Reports. Vol. 64 No. 1. National Center for Health Statistics, Hyattsville, MD.

McElroy, Marjorie B., Horney, Mary Jean, 1981. Nash-bargained household decisions: toward a generalization of the theory of demand. Int. Econ. Rev. 22 (2), 333–349.

Mincer, Jacob A., 1974. Schooling, Experience, and Earnings. Columbia University Press, New York.

Moen, Phyllis, Sweet, Stephen, 2004. From 'work–family' to 'flexible careers': a life course reframing. Community Work Fam. 7 (2), 209–226.

Mouw, Ted, Kalleberg, Arne L., 2010. Occupations and the structure of wage inequality in the United States, 1980s to 2000s. Am. Sociol. Rev. 75 (3), 402–431.

Noonan, Mary C., 2001. The impact of domestic work on men's and women's wages. J. Marriage Fam. 63 (4), 1134–1145.

Panel Study of Income Dynamics, public use dataset, 2015. Survey Research Center, Institute for Social Research. University of Michigan, Ann Arbor, MI.

Ridgeway, Cecilia L., Correll, Shelley J., 2004. Motherhood as a status characteristic. J. Soc. Issues 60 (4), 683–700.

Riggs, Janet Morgan, 1997. Mandates for mothers and fathers: perceptions of breadwinners and care givers. Sex Roles 37 (7–8), 565–580.

Ruggles, Steven, Genadek, Katie, Goeken, Ronald, Grover, Josiah, Sobek, Matthew, 2015. Integrated Public Use Microdata Series: Version 6.0 (Machine-Readable Database). University of Minnesota, Minneapolis, MN.

Sanchez, Laura, Thomson, Elizabeth, 1997. Becoming mothers and fathers: parenthood, gender, and the division of labor. Gend. Soc. 11 (6), 747–772.

Stone, Pamela, 2007. Opting Out? Why Women Really Quit Careers and Head Home. University of California Press, Berkeley, CA.

Taniguchi, Hiromi, 1999. The timing of childbearing and women's wages. J. Marriage Fam. 61 (4), 1008–1019.

Tichenor, Veronica Jaris, 2005. Earning More and Getting Less: Why Successful Wives Can't Buy Equality. Rutgers University Press, New Brunswick, NJ.

Townsend, Nicholas W., 2002. The Package Deal: Marriage, Work and Fatherhood in Men's Lives. Temple University Press, Philadelphia, PA.

Waldfogel, Jane, 1997. The effect of children on women's wages. Am. Sociol. Rev. 62 (2), 209–217.

Weeden, Kim, 2002. Why do some occupations pay more than others? Social closure and earnings inequality in the United States. Am. J. Sociol. 108 (1), 55–101.

West, Candace, Zimmerman, Don H., 1987. Doing gender. Gend. Soc. 1 (2), 125–151.

Western, Bruce, Bloome, Deirdre, Percheski, Christine, 2008. Inequality among American families with children, 1975 to 2005. Am. Sociol. Rev. 73 (6), 903–920.