Re-Thinking the Two-Body Problem: The Segregation of Women into Geographically-Dispersed Occupations

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Abstract. Research on the family cites the tendency for couples to relocate for husbands' careers as evidence against the gender-neutrality of household economic decisions. I test whether the prioritization of husbands' careers in mobility decisions is endogenous to men's and women's occupations. Consistent with this hypothesis, I find the tendency for households to relocate for husbands' careers is better-explained by the segregation of women into geographically-dispersed occupations in advance of marriage rather than by the direct prioritization of men's careers. I find that, even among never-married workers, women relocate for work less-often than men and that the gender effect disappears after accounting for segregation. While most two-earner families feature husbands in geographically-clustered jobs involving frequent relocation for work, families are no-less-likely to relocate for work when it belongs to the wife. I conclude future research in household mobility should treat occupational segregation occurring prior to marriage rather than gender bias within married couples as the primary explanation for the prioritization of husbands' careers in household mobility decisions.

Introduction

For young men and women balancing career and family ambitions, work relocation decisions often involve sacrificing one for the sake of the other. Sociological, economic, and demographic research consistently shows that work relocations strain marriages and impair the career of "tied movers" (see, for example, Cooke 2003; McKinnish 2008; and Mincer 1978). Occupation-specific studies highlight the challenges of reconciling two careers among physical and life scientists (McNeil and Sher 1999; Villaba 1999), academics (Helppie and Close 2011), and military officers (Gill and Haurin 2002). Large employers often offer informal or formal spousal placement assistance for workers with highly-specialized skills, and universities typically refer to the issue of recruiting couples as the "two-body problem."

Just as dual-career couples have become increasingly-common, so too has research on the two-body problem. Early research hypothesizes that relocation decisions maximizing the economic prospects of the family may impair the career of the trailing spouse (Long 1974; Mincer 1978; Sandell 1977). Subsequent empirical work confirms this hypothesis, and further shows relocation decisions tend to improve husbands' and impair wives' career development.[1] Critics of neoclassical economic models of household mobility cite the prioritization of husband's careers in relocation decisions net of earnings and educational controls as evidence that mobility decisions are governed by normative gender roles (see, for example, Bielby and Bielby 1992; Cooke 2003; Shihadeh 1991; and Sorenson and Dahl 2011).

[1] See, for example, Bailey and Cooke (1998), Battu, Harminder, and Sloane (1998), Boyle et al. (2001), Clark and Huang (2006), Jacobsen and Levin (1997), McKinnish (2008), Nivalainen (2005), Pixley and Moen (2003), Shauman and Noonan (2007), Swain and Garasky (2007), and Sorenson and Dahl (2011).

However, by focusing individual household mobility decisions, empirical work on the family neglects the role of occupational segregation in the two-body problem. The standard regression models predicting whom is a tied mover assume that the economic benefits of relocation are captured by earnings and educational controls, and that residual noise thereafter can be attributed to the direct effect of sex and not to omitted correlates. However, this assumption is violated if men and women segregate into constrained and flexible occupations, as would be the case if their career choices are made in anticipation of the two-body problem, or if labor market processes otherwise channel women into jobs that can be performed anywhere. In other words, the tendency for families to relocate for men's careers may be a feature of men's and women's *ex ante* career paths rather than families' *ex post* prioritization of husband's careers, and therefore endogenous. This analytical dilemma is also familiar, as existing research shows that men and women pursue different college majors, occupations, and job opportunities, and that selection and sorting mechanisms can explain much of the observed variation in standard inequality outcomes (see, for example, Petersen 1995; Tam 1997; and Fernandez and Friedrich 2011).

This study tests for the bias posed by occupational segregation in inducing families to prioritize husbands' careers in relocation decisions. I operationalize the constraint or flexibility of occupations by examining the observed geographic distribution of the occupation—particularly the degree to which an occupation is geographically "clustered" (like petroleum engineers) or "dispersed" (like elementary school teachers). Although this study is agnostic to the particular reasons why this segregation occurs (and is only interested insofar that it potentially confounds predictors of geographic mobility), it may be a result of the segregation of women into nurturing or support occupations (such as nursing or secretaries) that perform activities that must be done in-person (see Anker 1997 or Cohen and Huffman 2003, for

reviews). Alternatively, the tendency for relocation decisions to benefit men's careers may be endogenous if young men and women expect this when they choose their career paths (Benson 2011).

For studies attributing the tendency for families to prioritize husbands' careers in relocation decisions to household norms, the scenario that men and women consider their relative mobility when selecting their careers is problematic because it offers a specific reason why the geographic flexibility of occupations (or the degree to which they require relocation for career advancement) would not be random by sex. Specifically, families may prioritize husbands' careers in mobility decisions because men are more likely to possess a career that benefits from calculated relocations, and women are more likely to possess a career that can be pursued anywhere. If so, even after adopting the usual educational and earnings controls, the economic consequences of relocating may not be random by sex, and the tendency for families to relocate for husbands' careers may be endogenous.

To evaluate mobility bias for one sex in household relocation decisions, I examine whether the segregation of women into geographically-dispersed occupations explains families' tendency to favor husbands' careers in relocation decisions. I examine the propensity to relocate for work by marital status and by sex, and before and after controlling for a measure of occupational clustering. I use a generalization of Duncan's dissimilarity index that indicates the share of workers in an occupation that would need to relocate for that occupation to employ the same number of workers per capita in every U.S. metropolitan area, with high values corresponding to clustered occupations, *i.e.* those employed in few cities (Benson 2011). I calculate this index for each occupation in the Decennial Census 5% PUMS (which has many observations), and match it to household occupations in the 2003-2010 March CPS (which has work relocation data). I

find that, even among never-married workers (*i.e.* those whose relocations are not constrained by a spouse), men are more-likely than women to relocate for work. However, controlling for occupational clustering eliminates the independent effect of sex, suggesting the tendency to relocate for work is explained by the segregation of women into geographically-dispersed occupations in advance of marriage.

I find married-couple households are more likely to relocate for work when a head possesses a geographically-clustered occupation, and that households featuring a husband in the more-clustered occupation is about twice as common as the reverse. However, despite the precise estimates afforded by the CPS, the difference in mobility when this occupation belongs to the husband versus the wife is not statistically significant. Notably, I find that an occupational characteristic constructed from the Census (the geographic distribution of a job) presents a classic omitted variable bias for naïve regressions of relocation-on-sex, and that correcting for this bias is sufficient to yield a precisely-estimated zero effect of sex. This distinguishes the measure from other compositional variables that do not eliminate the significance of sex. I conclude families tend to relocate for the husband's career due to the tendency of men to work in occupations that are geographically-clustered.

These results contextualize empirical work on household mobility in a life-course setting. Specifically, the segregation of highly-educated women into geographically-dispersed skilled occupations (such as teachers, dentists, or general managers, and not nuclear engineers or naval architects) may explain why household relocations appear to be sensitive to the husband's college education but not the wife's (see, for example, Compton and Pollak 2007; McKinnish 2008). Results suggest research on the family should focus on mechanisms promoting occupational segregation in advance of marriage, rather than direct intra-household

discrimination, as the primary setting of the two-body problem's effects. Lastly, results suggest that reducing the disproportionate impact of the two-body problem on women's careers may be more difficult than previously believed because it is embedded in occupational segregation occurring even among the non-married.

I. GENDER AND HOUSEHOLD MIGRATION

Since the U.S. postwar period and civil rights movement, women have reversed the education gap and reduced the labor force participation and earnings gaps. Since 1982, women have constituted the majority of new bachelor's degree holders in the US. Women's rising educational attainment helped narrow the overall sex pay gap and increased the share of household income contributed by women (Brewster and Padavic 2000; Ciabattari 2001; Simon and Landis 1989). While women's economic progress is easily tracked using public-use data, research on gender and the family uses a variety of theoretical frameworks, data, and methodologies.

Due to validity concerns of self-reported attitudes, most empirical research analyzes trends in families' observed or reported behaviors—such as the allocation of household chores[2] or relocation decisions—as a function of men's and women's relative economic characteristics and the family's circumstances (Pixley and Moen 2003). This literature typically aims to distinguish among a wide range of theories, particularly the neoclassical theory of the household (Becker 1985), relative resources and bargaining models (Blood and Wolfe 1960; Bowles and McGinn 2008; Lundberg and Pollak 1996; Lundberg, Pollak, and Wales 1997; Phipps and Burton 1998; Scanzoni 1972), and normative theories of socialization and the performance of gender roles (Cooke 2003; Costrich et al. 1975; McHale and Crouter 1992).

[2] Bittman et al. 2003; England and Kilbourne 1990; Spitze 1988; see Baxter 1998 for a review). The neoclassical model hypothesizes that rising productivity in the external labor market relative to household labor (for example, due to formal education) will prompt families to substitute women's labor away from domestic work.

The hypothesis that households educate and socialize children according to their expected future gender roles has a long tradition across the social sciences. Classic studies by Berk (1985) and Hochschild and Machung (1989) document how families' childrearing routines reproduce normative conceptions gender and the "fair" division of household labor (for a recent review, see Friede Westring and Ryan 2011). Economists hypothesize that families are rational to adapt the content of children's formal and household education on the gender of the child (see, for example, Echevarria and Merlo 1999; Engineer and Welling 1999; Hadfield 1999). Although normative and rational accounts feature stark epistemological differences, on the whole, they both posit that the reproduction of gendered behaviors begins early in the life cycle.

Another behavioral approach tests whether household migration decisions are egalitarian. Like the allocation of household chores, researchers interpret a tendency for women's earnings and employment to temporarily decline after household moves as evidence for the normative prioritization of men's participation in the external market. These analyses typically begin from neoclassical models of the household that hypothesize gendered domestic labor and household relocation decisions are attributable to differences in men's and women's innate and accumulated human capital, and that gender role ideology does not need to be invoked to explain the tendency for household economic decisions to advantage the husband's career. In the context of household migration, Mincer (1978) notes decisions to relocate for the economic well-being of the family may disadvantage the career of the "tied mover," while decisions not to relocate may disadvantage the career of the "tied stayer."

Like research on the allocation of household chores, research on household relocation decisions is made difficult by the challenge of fully-controlling for the economic attributes of husbands and wives. These controls are essential, since men and women differ in education,

experience, personal career goals, and other characteristics likely to affect the economic consequences of relocation decisions. Because empirical work estimating the likelihood of relocation necessarily interprets significant effects for sex net of the controls suggested by neoclassical theory as evidence of *direct* effect of sex, it is crucial that these controls capture all characteristics that are both correlated with sex and predictive of the economic benefits of relocation.

Consistent with Mincer, empirical work consistently finds that household relocations typically benefit the career of one spouse to the detriment of the other (Bailey and Cooke 1998; Battu, Harminder, and Sloane 1998; Boyle et al. 2001; Clark and Huang 2006; Jacobsen and Levin 1997; McKinnish 2008; Nivalainen 2005; Pixley and Moen 2003; Shauman and Noonan 2007). For these reasons, relocation decisions offer a potential mechanism through which men and women differ in career outcomes (Pixley and Moen 2003).

However, critics of the neoclassical view interpret the prioritization of the husband's career in mobility decisions as an enactment of traditional gender roles (see, for example, Bielby and Bielby 1992; Nivalainen 2004; Cooke 2003; Swain and Garasky 2007). On the whole, studies find evidence that household relocation decisions are made with economic motives, but that sex effects after controlling for husbands' and wives' education and earnings imply non-economic causes as well (Markham and Pleck 1986; McKinnish 2008; Noe et al. 1988; Ostroff and Clark 2001; Pixley and Moen 2003; Turban, Campion, and Eyring 1992; Zvonkovic et al. 1996).

While the immediate consequences of the two-body problem on the trailing-spouse's labor market outcomes are now well-evidenced, research has only-rarely and only-recently shifted focus to long-term, life-course consequences of the two-body problem and the tendency for families to relocate for men's careers. As Pixley (2008) notes, the emphasis on individual

mobility decisions, rather than broader life-course implications, may be a result of a methodological convenience rather than analytical importance.

Since Pixley's critique, there have been a few notable efforts to examine how occupational characteristics mediate Using the PSID and Census, Shauman (2010) examines both individual and occupational predictors of relocation (for all reported reasons for relocating, unlike this study), and finds that controlling for occupational characteristics enhances individual-level predictors of mobility. Brandén and Ström (2011) find sex segregation around wage profile characteristics among Swedish couples, and find evidence of both location coordination among working spouses and distinct patterns among men and women. While fully-controlling for the set of potential differences between occupations remains an ambition for this literature, on the whole, there appears to be evidence for both systematic sex segregation around occupational characteristics and significant residual variation in mobility explained by sex.

II. THEORY

The standard regressions estimating men's and women's economic outcomes upon household relocation assume the economic rewards for relocation may be captured by the usual controls, such as those for earnings and education. When predicting relocation for work by sex, occupational segregation (*i.e.* a correlation between sex and occupation) is not a concern if this segregation is otherwise-random with respect to which they require calculated work relocations for career advancement. However, if men segregate into geographically-clustered occupations involving frequent work relocation, and women segregate into geographically-dispersed occupations that are adaptable to spousal relocation, then occupational characteristics correlated with both sex and propensity to relocate remain in the residual term. This form of omitted variable bias violates the usual assumption that the error term is independent of the regressors.

Theoretically, there are several reasons to expect that occupational segregation would be non-random with respect to mobility. Empirical work on men's and women's college major choices and career aspirations suggest segregation in career paths begins early in the life course. Blau and Ferber (1991) find that college students' career and family ambitions and expectations generally differ by gender. Daymont and Andrisani (1984) find that men are more likely to major in science, technology, engineering, and math, while women are more likely to major in education, the humanities, health, and biology; this is notable because the former typically lead to jobs in knowledge-work that are geographically-constrained, while the latter lead to jobs in human services that are generally flexible.

Descriptive work finds that men and women search for jobs differently. Interviews by Hanson and Pratt (2005) find that women tend to search for jobs more-locally than do men, and that the geographic scope of women's job search is less-likely to require household relocation. Becker and Moen (1999) find that dual-earner couples relocation decisions are often governed by the explicit prioritization of one spouse's "career" over the other's "job," with most "careers" belonging to the husband, but not all.

If men and women expect families to prioritize husbands' careers in relocation decisions, this may in turn compel women to sort into flexible occupations, thereby reproducing occupational segregation. For instance, Benson (2011) hypothesizes that existing patterns of occupational segregation shape young men and women's expectations of their future ability to relocate for work, leading them to reproduce the existing pattern of segregation whereby men expect to be able to relocate and so enter jobs that reward calculated relocations, and women expect men to segregate into these jobs and so are pressured to enter dispersed occupations. He also finds that men who enter dispersed occupations and women who enter clustered occupations experience

career earnings penalties, marriage delays, and higher divorce rates than those who conform to existing patterns of segregation by entering clustered and dispersed occupations, respectively.

Although the coordination dilemma hypothesized by Benson does not invoke direct penalties for women who enter geographically-clustered occupations, organizational and labor market processes may also disadvantage women and segregate them into geographically-dispersed support occupations offering few opportunities for career advancement and few rewards for calculated relocations. Social-structural accounts of gendered behavior argue differences reflect a lack of opportunity for the advancement of women (see, for example, Acker 1990, Epstein 1990, Kanter 1977, Ressner 1987).

Others caution against interpreting features of inequality, including occupational segregation, as conscious choice. Rather, the segregation of women into dispersed occupations may be a result of unconscious enactment, or what Giddens (1984) refers to as "practical consciousness." Giddens and others (see especially Connell 1987, Risman 1998) explore structure and action as a dynamic, recursive, and a product of reflexive feedback. The image of the career-oriented female who frequently relocates to pursue her career may be inconsistent with young women's cognitive image of the family, which in turn shapes their career pursuits, deprives future generations of role models and reproduces cultural expectations.

Regardless of the cause, occupational segregation is a potential concern for empirical research on household mobility because occupations are not random by sex and geographic mobility is not random by occupation. These two conditions yield classic omitted variable bias (OVB), with the possibility that segregation anticipates the two-body problem further implying endogeneity. I describe variation in the geographic clustering of occupations, including within bachelor's degree holders, in the data section.

The results section replicates earlier empirical research on household mobility, signs the OVB posed by segregation (*i.e.*, mechanically shows whether it will be positive or negative), and then presents results after correcting for the bias. Specifically, I replicate earlier results by estimating the unconditional effect of sex on the propensity to relocate for work (sex and mobility). Second, I sign the correlations between the independent variable of interest with the omitted variable of concern (sex and clustering) and between the omitted variable of concern with the dependent variable (clustering and mobility), thereby mechanically signing the direction of OVB (men are more-likely to work in clustered occupations, and clustered occupations are more-likely to relocate for work among both sexes). Lastly, I estimate the effect of independent effect of sex after correcting for this particular OVB by controlling occupational clustering.[3] I do this for all workers and for highly-educated workers.

Hypothesis 1 executes this empirical strategy among never-married workers. Showing biases for one sex in relocation for work among never-married workers is striking since these men and women are, by definition, not tied to a spouse. This hypothesis is also important because it tests whether occupational sorting occurs in advance of marriage.

> Hypothesis 1: Never-married women relocate for work less-frequently than men, which is attributable to women's segregation into dispersed occupations.
>
> > 1A: Never-married men are more likely than never-married women to work in geographically-clustered occupations.

[3] The study of the segregation of women into low-paying jobs within firms is a familiar application of this approach; fine-grained controls reduce and virtually eliminate the estimated effect of sex (see, for example, Kilbourne et. Al. 1994, Petersen and Morgan 1995, or Reskin and Bielby 2005). However, because relocations-for-work are rare, introducing occupational controls makes tests very weak. Including a linear term for clustering instead maintains the statistical power of the test while tying results to the specific theoretical construct of provided by clustering.

1B: Geographically-clustered occupations are correlated with greater relocation for work than dispersed occupations for both never-married men and women.

1C: Before controlling for occupational-clustering, never-married women are less-likely to relocate for work than never-married men.

1D: After controlling for occupational-clustering, never-married women are *not* less-likely to relocate for work than men.

In essence, Hypothesis 1A examines the covariance of sex with clustering and 1B examines the direct effect of clustering on mobility. Together, these mechanically sign the direction of the OVB. Hypothesis 1C reproduces naïve regressions by examining the effect of sex without controlling for clustering (ie. with OVB), and 1D examines the effect of sex net of occupational clustering (after reintroducing the control for clustering to address the OVB). Note that Hypothesis 1D is a null prediction and should be interpreted to signify that we can achieve a reasonably-precise estimate of a small effect of sex after introducing the control.

Hypothesis 2 executes this empirical strategy with married workers. Specifically, I test whether occupational segregation explains the propensity for families to relocate for husband's careers. Unfortunately, the CPS does not ask for whose occupation the household relocates for work, precluding straightforward estimation when both heads are in the labor force. To address this, I test whether the effect of occupational clustering on job mobility among single-earner men and women is positive, and whether the marginal effect of the maximal clustering score on mobility for dual-earner couples is positive. Then, I examine whether dual-earner couples tend to feature husbands' in occupations that are more geographically-clustered than the wife's. Finally, I examine whether family mobility increases with occupational clustering, and that after controlling for clustering, likelihood of relocation is independent of sex. This offers an

alternative explanation for existing studies that use families' propensity to relocate for husband's careers to infer a normative prioritization of husbands' careers in mobility decisions, suggesting they are endogenous to men and women's occupations.

Hypothesis 2: The propensity for families to relocate for husband's careers is explained by segregation of men into clustered and the segregation of women into dispersed occupations.

2A: Families tend to feature a husband in an occupation that is more geographically-clustered than the wife.

2B: Among dual earners, for the spouse with the more-clustered occupation, the marginal effect of geographical clustering on the likelihood of relocating is positive.

2C: Among dual earners, for the spouse with the more-clustered occupation, the marginal effect of geographical clustering on the likelihood of relocating is independent of sex.

Hypothesis 2A and 2B establish the necessary correlations for OVB to cause naïve regression estimates to overestimate the independent effect of sex on households' propensity to relocate. Hypothesis 2C then estimates the independent effect of sex net of a control for the maximum degree of occupational clustering within the family. Once again, this is a null prediction, and should be interpreted as a test that the predicted effect of sex is small and estimated with reasonably-high precision. A marginal effect of maximal occupational clustering on a families' likelihood of relocation that is positive (2B) and identical by sex (2C), whereby families tend to feature a husband in the more-clustered occupation (2A), implies the propensity for families to

relocate for the husband's job is due to the tendency of families to exhibit men in clustered occupations.

For each hypothesis, I analyze highly-educated workers separately. Primary and secondary education in the United States is highly general with specialization occurring largely through college and internships. Because switching away from career specialties due to family concerns is likely to involve the forfeiture of productive skills, the dissociation from professional networks, and a loss in professional identity, sex-based occupational clustering is expected to be more-pronounced among highly-skilled occupations. For example, gaming cage workers, who are generally employed by casinos to exchange money for chips, require little formal or informal training. Because they are concentrated in few cities (such as Las Vegas, Atlantic City, Reno, and Biloxi), gaming cage workers are a very geographically-clustered female-dominated occupation. While the cost of being a trailing spouse and switching occupations from a gaming cage worker to a cashier is likely to involve little loss in career prospects or professional identity, it is reasonable to expect greater costs of being a trailing spouse in clustered occupations that are more-highly educated (for example, a geographically-displaced nuclear engineer may become a math teacher).

III. DATA

I calculate an occupational clustering index using the 5% public-use microdata samples (5% PUMS) of the 1980, 1990, and 2000 Decennial Census.[4] The Decennial Census features the large number of observations (about eight million workers per Census year) needed to estimate the employment share of each occupation in each metropolitan statistical area. Occupations are standardized to the 1980 Standard Occupational Classifications (SOC) using the Census

[4] Available online. See Ruggles et al. (2010).

Bureau's occupational crosswalk. The pre-normalized clustering index for a given occupation is taken from Benson's (2011) generalization of Duncan's dissimilarity index:

$$\mathrm{C}_j^* = \frac{1}{2}\sum_{i=1}^{I}\left|\frac{n_{ij}}{n_j} - \frac{n_i - n_{ij}}{n - n_j}\right|$$

where *I* represents the set of metropolitan areas, *n* represents the counts of workers aged 18-65 in the labor force, and subscripts denote counts within metropolitan areas *i* and occupations *j*. I calculate this index for each occupation and Census year. The pre-normalized clustering index *C** is then normalized as follows. First, I take the log-transformation of *C**, yielding a roughly-normal distribution with values ranging from -3.22 for the most-dispersed occupation to -0.36 for the most-clustered. For simplicity, the index is normalized by addition so that the most-dispersed occupation receives a *C*-score of 0. This is a monotonic transformation, so the rank-order of *C** is preserved, with high values for *C** and *C* corresponding to highly-clustered occupations. The clustering indices are then merged to occupations in the CPS March Supplement, with the 2003-2010 March Supplements representing those with the six-digit 2000 Standard Occupational Classification (SOC) codes used in 2000 Decennial Census.[5]

While Duncan's D is conventionally used for dichotomous dissimilarity (e.g. sex), the generalized form is also appropriate for polytomous dissimilarity (e.g. U.S. metropolitan areas).

[5] The 2000 PUMS distinguishes 337 occupations by (up to) a six-digit SOC code. By exploiting the hierarchical nature of SOC Codes, it is easy to show that aggregating occupations (for example, to three digit categories) reduces the magnitude of the effects, suggesting potential aggregation bias. This bias is also noted by Reskin (1993: 243): "`college and university teacher' includes someone teaching night classes on repairing office machines at Parkland Community College as well as a distinguished professor of mathematics at Harvard." Likewise, segregation into highly-mobile sub-specialties within occupations would not be captured by aggregate measures like SOC codes. The resulting measurement error (in the independent variable) is expected to cause attenuation bias, reducing the magnitude of the estimated coefficients and increasing the standard errors.

It also retains the intuition interpretation that makes Duncan's D a desirable measure: it is the share of workers within an occupation that must relocate for the share of workers to be balanced in every metropolitan area. For example, in 1980, elementary school teachers constituted about 1% of the national labor force. The pre-normalized clustering index C^* for elementary school teachers is 0.053, signifying that in 1980, 5.3% of them would need to relocate for elementary school teachers to constitute 1% of the labor force in every metropolitan area within the United States. In contrast, the pre-normalized clustering index C^*_{1980} for mining and petroleum engineers is 0.731, signifying that 73.1% would need to relocate to equalize the labor force share of petroleum engineers. Within the 1980 sample, these occupations represent the most-dispersed and most-clustered non-military occupations where the majority of workers have bachelor's degrees, respectively. In the full sample, textile winding setters are the most-clustered occupation and retail salespeople are the most-dispersed.

Comparing the distribution of occupations (using the Decennial Census) rather than comparing differences in mobility rates by occupation (for example, using the CPS, PSID, or Census) has several distinct advantages.

First, the geographic distribution of an occupation is plausibly exogenous. For example, petroleum engineers are concentrated around oil fields, and primary school teachers are dispersed around children (see Ellison and Glaeser 1997 for a discussion of the geographic agglomeration of occupations). Realized relocation decisions are endogenous. Indeed, because relocation is the outcome variable, regressing relocation on average relocation by job threatens a mechanical relationship when calculated with the same population.

Second, the geographic distribution of an occupation more-directly measures the geographic-flexibility of a trailing spouse. It is not clear from the incidence of work relocations alone

whether the geography of the relocating worker was constrained. For example, using mobility rates, McKinnish (2008) finds veterinarians, head cooks, and cashiers to relocate often, but intuitively these jobs would be relatively-robust to spousal relocations.

Third, an advantage of the clustering index is that the Census does not report why individuals relocate for work. This is highly problematic because only 10% of CPS households that relocate report doing so primarily for work or job transfers; workers may even relocate precisely because their job is highly flexible (enabling workers to relocate for family reasons, for personal preferences, or indeed to relocate for a spouse).[6] Taken together, it seems unlikely that the high mobility in certain occupations implies tied-movers risk major career penalties for geographic displacement. The chief disadvantage is that there are also occupations that are dispersed but may require relocations for career advancement (clergy, which McKinnish notes are highly-mobile, may be an example).

[FIGURE 1]

To provide an illustration of occupational clustering, Figure 1 presents the geographic distributions of the three SOC occupations: physicians and surgeons, medical scientists, and physicists and astronomers.[7] The geographic-dispersion (and low clustering score) for physicians and surgeons shows that they are employed relatively-evenly among US metropolitan areas. In contrast, physicists and astronomers are highly clustered around the US Department of Energy National Laboratories, with many metropolitan areas employing no physicists or astronomers. Indeed, new doctoral degree recipients who plan to enter a career in physics may be expected to work in a variety of different national laboratories before settling down. A list of the fifteen

[6] Unfortunately, while the CPS reports the principal reason for household relocations, it is far too small to estimate relocation likelihoods by occupation.

[7] "Physicists and astronomers" are treated as distinct from "post-secondary teachers" by the Bureau of Labor Statistics.

most-clustered and most-dispersed occupations for which the majority of workers have graduate degrees is reported in Table 1.

[TABLE 1]

Table 1 shows that none of the twenty most-clustered occupations were majority-female in 1980 and only one became majority-female by 2000 (archivists and curators). In contrast, fifteen of the twenty most-dispersed occupations were majority female in 1980 or became majority female by 2000. The exceptions are “other financial specialists,” “physicians,” “clergy and other religious workers,” and “dentists,” which respectively rose in female share to 47%, 27%, 19%, and 30% in that period. “CEOs and public administrators” declined in female share in that period (from 25% to 19%); although this categorized as a “dispersed occupation” in the Census, this occupation is conceptually problematic given that it includes everyone from owners of small restaurants to Fortune 500 CEOs. Table 1 also shows that many of the most highly-dispersed high-skill occupations absorbed a larger share of highly-educated women than might otherwise be predicted by sex-typing or the segregation of women into “caring” occupations. For example, financial managers, accountants, auditors, advertisers, and clinical lab technicians are highly-dispersed occupations featuring few female-type work attributes, but doubled in female-share from 1980 to 2000 to become majority-female.

While some highly-skilled occupations became more-clustered or more-dispersed, the mean extent of occupational clustering stayed roughly constant from 1980 to 2000. In particular, geologists, writers, therapists, and special education teachers became considerably more-dispersed (the measure dropped by more than 20%) while only medical scientists became considerably more-clustered (the measure increased by more than 20%).

Taken altogether, occupations that are geographically clustered generally exhibit many of the hallmarks of "careers," including earnings, labor force participation, and staying within-occupation (not shown, but available upon request). This pattern occurs both with and without controlling for sex.

Results for married couples include couples where both heads are married with a present spouse. I examine relocation incidence for workers younger than 35 to focus on those most at-risk of marriage and work relocations. A relocation is considered a change in the previous twelve months, and respondents are prompted for the primarily reason for the relocation. Likewise, persons occupations are matched on the occupation in the previous year (i.e. for those relocating, I use occupations prior to relocation). Common reasons include relocation for family, upgrading housing, or change in marital status. Relocations "for work or job transfer" include about 10% of relocations. I further restrict "work relocations" to signify relocations outside of the county.

IV. RESULTS

To test the hypothesis that women sort into geographically-dispersed occupations in advance of marriage (Hypothesis 1A), I perform a two-sample t-test for occupational clustering by sex among never-married men and women in the 2000 Decennial Census. Never-married women have an estimated mean clustering score of 1.1078 with a standard error of 0.0005. Never-married men have a mean clustering score of 1.1540 with a standard error of 0.0005. The estimated difference is 0.220 with a standard error of 0.0007. Mean clustering scores for bachelor's degree-holding men and women are 1.153 and 1.073, respectively, with standard errors less than 0.001. Two-sample t-test rejects these samples have equal means with $p<0.001$, and I conclude never-married men have higher mean clustering scores than women. Figure 2 illustrates the relationship between occupational clustering and female share.

[FIGURE 2]

Next, I test the relationship between the occupational clustering index and the propensity to relocate for work among both never-married men and women using the 2003-2010 CPS March Supplements (Hypotheses 1A-1C). The March CPS was chosen because it offers the finest level of occupational detail (the 2000 Standard Occupational Codes), and because the March CPS asks whether households relocated in the previous year. It asks relocating households to report the primary reason for relocating, including "for work or job transfer."

The full regressions take the form:

$$\text{logit}(p_i) = \hat{\beta}_0 + \hat{\beta}_1 C_i + \hat{\beta}_2 F_i$$

where logit(p_i) is the logistic regression's estimated probability of a work-related inter-county move, C_i is the clustering index score of individual i, and F_i is an indicator for whether the log-likelihood that a household makes an inter-county relocation and cites work is the primary reason. Regressions are presented (i) omitting the F_i, to test Hypothesis 1B's prediction that clustering is positively correlated with work relocations, among the CPS sample of men, (ii) again omitting F_i, but for women (iii) omitting C_i, inviting OVB and testing Hypothesis 1C that females are less likely to relocate for work than men, and (iv) as the full regression, to test Hypothesis 1D and the effect of sex as an independent predictor. Table 2 presents results.

[TABLE 2]

Table 2, Columns 1 and 2 find that both young never-married men and women in geographically-clustered occupations are more-likely to relocate than those in dispersed occupations, lending support for Hypothesis 1B ($p<0.001$; two-tailed test). The magnitude is quite stark; the range of the index is 2.45, and a one point increase in the index corresponds to a 38% increase in likelihood of relocating for work among all never-married and a 57% increase

among never-married women. Columns 3 finds that never-married women are less-likely to relocate for work than men before controlling for occupational clustering, consistent with Hypothesis 1C ($p<0.001$). Column 4 shows that the effect of being female drops to 4%, which is no longer statistically significant ($p=0.30$), implying that never-married women's lower likelihood to relocate for work is attributable to their tendency to work in more-dispersed occupations rather than the direct effect of sex, consistent with Hypothesis 1D.[8]

Results are similar among bachelor's degree holders. Never-married bachelor's degree holders are more likely to relocate when they work in clustered occupations and women are less-likely to relocate than men, consistent with Hypotheses 1B and 1C. Controlling for occupational clustering reduces the effect of being female among graduates, yielding small but significant estimates for effect of being female on mobility. Model 8 estimates that a one log point increase in clustering increases the likelihood of relocating for work among young, bachelor's degree-holding workers by 52%, and females are 15% less likely to relocate for work than men.

Results broadly corroborate Hypothesis 1. Both never-married men and women relocate for work more often when they work in clustered occupations. While women relocate for work less-often than men, this is largely explained by their tendency to segregate into geographically-dispersed occupations. In the full sample, OVB explains the increased propensity to relocate for work among never-married men. Among highly-educated workers, OVB explains part of the

[8] To sign the omitted variable bias posed by the correlation between sex and occupational clustering, I examine pairwise correlations between a female dummy, a worker's occupational clustering score, and the probability a worker relocates for work For the full sample of workers, a split sample of young and old workers (above and below age 40), never-married and married workers, and bachelor's degree and non-bachelor's degree holding workers (for a total of 9, or $1 + 2^3$), I find that the correlation between female and the clustering score is negative (Hypothesis 1A) and the correlation between correlation between the clustering score and relocation for work is positive (Hypothesis 1B), both with $p < 0.01$. While correlations were strongest among the young and college-educated, this check suggests the OVB very-broadly leads to downwardly-biased estimates of the independent effect of sex on relocation for work.

effect of sex, and occupational clustering is generally a more-powerful predictor of mobility than sex alone. Results show that omitting occupational characteristics from mobility regressions biases results and overestimates the independent effect of sex on likelihood of relocating for work.[9]

Next, I examine occupational clustering within families and its effect on relocation (Hypothesis 2). I use the CPS March Supplement 2003-2010 to test for the existence of clustering within the family and the marginal effect of clustering for both men and women for a family's mobility. Results are reported in Table 3.

[TABLE 3]

Consistent with Hypothesis 2A, men tend to work in occupations that are more-geographically clustered than women. For both all dual-earner couples and the subset of "power couples" in which both heads with bachelor's degrees (or greater), there are about two times as many couples featuring a husband with the more-clustered occupation than the reverse.

Unfortunately, the CPS does not ask for whose career a work-related relocation was primarily made. Instead, I examine the likelihood the family relocates for work as a function of their occupational clustering. As shown in the Data section, highly-clustered occupations tend to involve frequent mobility for work among never-married individuals. They also strongly-predict relocation for work among single-earner couples, with a one log-point increase in the clustering

[9] Primary reason for relocation is a self-reported variable, and I also examine relocation reported for reasons other than work (results are available upon request). Treating all relocations as the dependent variable reduce the magnitude of coefficients, the effect of clustering remains significant in all regressions, female loses significance in columns (3) and (7). Treating relocations primarily "for family" as the dependent variable makes clustering lose significance, and females are more likely to relocate. I interpret results to suggest never-married women are more likely than men to cite family as the primary reason they relocate, and the geographic clustering of a job is a better predictor of relocations that households report are primarily "for work."

index increasing the likelihood the family relocates for work by 29% (with a standard error of 6%).

For dual earner couples, I test the effect of clustering on work relocations. Because these couples have two jobs with a clustering score, to focus on the occupations for which families are more-likely to relocate, I estimate household mobility using the score of the more-clustered occupation. To test whether the effect of clustering is different by sex, I estimate this parameter separately for families where the more-clustered occupation belongs to the husband and for which the more-clustered occupation belongs to the wife (although, as shown in Table 3, most families exhibit the former). I control for the difference in occupational clustering between the two heads, children, earnings, and education.

Specifically, the full regressions take the form:

$$\text{logit}(p_i) = \hat{\beta}_0 + \hat{\beta}_1 C_{im} + \hat{\beta}_2 C_{if} + \hat{\beta}_3 C_{diff} + \mathbf{XB}$$

where p_i is the logit-estimated probability a household makes an inter-county work relocation, C_{im} and C_{if} are the clustering indices of the male's/female's occupation if it is the more-clustered of the two occupations (and is otherwise zero), C_{diff} is the difference between the more and less-clustered occupation, and XB includes controls. The parameters $\hat{\beta}_1$ and $\hat{\beta}_2$ can be interpreted as the marginal effect of clustering for the more-clustered occupation, when that belongs to the husband or wife, respectively.

Following Hypothesis 2B, families with at least one clustered occupation are expected to relocate more often when dual earner couples work in dispersed occupations, and so positive coefficients would signify that the effect of clustering is positively correlated with likelihood of relocating for work for the more-clustered occupation. The key test, corresponding to Hypothesis 2C, is whether the marginal effects significantly differ by sex; ie. whether families tend to

relocate when the husband alone is in a highly-clustered occupation but not the wife. Results are shown in Table 4.

[TABLE 4]

Consistent with Hypothesis 2B, Table 4 shows that families are more-likely to relocate for work when a head possesses a geographically-clustered occupation. Point estimates for the families' likelihood of relocating for work are slightly greater when the husband has the more-clustered occupation, but consistent with Hypothesis 2C, the difference when the wife has the more-clustered occupation is very small and not statistically significantly different.

In all regressions, effect of the difference in clustering is positive and not statistically significant, providing insufficient evidence to conclude households featuring one highly-constrained occupation and one highly-flexible occupation are particularly likely to move, compared to households with two similarly-constrained occupations (or vice versa).

Results are robust to the typical controls used in the family mobility literature, including children, education, and earnings. While children clearly reduce families' mobility, the only other statistically-significant predictor of mobility (net of clustering and other controls) is the husband's education. This finding is consistent with McKinnish's (2008) finding that family mobility is predicted by the husband's, but not the wife's, attainment of a bachelor's degree.[10]

[TABLE 5]

[10] To sign the omitted variable bias posed by the correlation of sex and occupational clustering, I examine pairwise correlations using the same split samples examined for Hypothesis 1, using average household head age rather than individual age, and using the marginal effect of maximal clustering between the two heads. The correlation between female and the occupational clustering is negative, and the correlation between work relocation and the maximal clustering score is positive with $p < 0.01$ in each of the nine splits, implying the estimated effect likelihood of moving for the female's occupation due to the independent effect of sex is biased downward.

Table 5 presents results for "power couples," *i.e.* couples in which both the husband and wife have bachelor's degrees. Because power couples tend to have occupationally-specific skills, high earnings potential, and high labor force attachment, they are often the subject of research on couples' colocation problem. Results for power couples are substantively the same. The effect of clustering on relocation is stronger for both men and women, and not statistically different between the two.

V. CONCLUSIONS

While previous research uses the tendency of families to prioritize husbands' careers in relocation decisions to infer traditional family norms, results suggest this tendency is primarily driven by the segregation of women into geographically-flexible jobs occurring among both the never-married and the married. This segregation may occur specifically in anticipation of the prioritization of husband's careers in mobility decisions or due to other features of the occupation correlated with both occupational dispersion and segregation. Using a classic omitted variable bias framework and a measure of occupational clustering, I find that women relocate-for-work less often than men even in advance of marriage, and that this is explained by their segregation into geographically-dispersed jobs. I also find that, while families tend to feature a husband in an occupation that is more-constrained than that of the wife, household mobility is equally sensitive to the husband's geographic constraint as to the wife's.

This finding may help explain several outstanding empirical puzzles in the study of household mobility and in inequality. One of the most robust findings in the household mobility literature is that family mobility is sensitive to whether the husband is college-educated, but not the wife (Compton and Pollak 2007; McKinnish 2008). The tendency of men to pursue technical college majors leading to careers in engineering in the sciences, and for women to enter more

occupationally-general majors in the humanities and flexible occupations in health care and education, may explain why families' mobility tends to be more sensitive to the husband's higher education. The segregation of women into geographically-dispersed occupations may also explain why women tend to work closer to home than men, particularly when women work in female-segregated jobs (see Hanson and Pratt 1995 or Fernandez and Su 2004 for reviews).

This finding is also consistent with a growing body of inequality research that emphasizes the role of compositional and selection effects, rather than direct discrimination, in driving inequality. For example, although naïve regressions confirm that women earn less than men, studies consistently show that the sex pay gap can be reduced with occupational controls and virtually eliminated when controlling for positions within firms (England et al. 1988; Kilbourne et al. 1994; Petersen and Morgan 1995). Fernandez and Sosa (2005), analyzing application processing for customer service jobs at a bank, find that women are more likely to receive interview offers than similar men. This compositional effect suggests a caveat to the success of women; despite women's gains in education, earnings, and labor force participation, women continue to invest in careers amenable to relocating for a husband.

Some caveats deserve mention. First, while this study highlights occupational segregation as a concern for studies examining gender and mobility, it is agnostic to why this segregation exists. This study offers a number of hypotheses: the segregation of women into dispersed occupations may be due to gender-typed occupational characteristics, unequal opportunity, or the anticipation (more-so than men) of being a tied-mover. Second, occupational clustering remains an imperfect proxy of to the degree to which an occupation truly enjoys geographic flexibility. For example, post-secondary teachers are relatively-dispersed, but the careers of young academics are likely to

benefit from the ability to make calculated relocation decisions. Future research may operationalize other measures of how robust occupations are to exogenous relocations.

For the literature on occupational segregation, future research may add the ability of an occupation to locate exogenously (e.g. for family or for a spouse) as one of occupational characteristics correlated with the gender composition. It also may offer an explanation for why the highly-educated, and traditionally male-dominated occupations that were geographically-dispersed (such as physicians, dentists, general managers) absorbed so much of the growth of highly-educated women in recent decades, while more–clustered occupations (typically more-technical occupations, such as specialized engineers) have not.[11]

For the literature on gender and the family, particularly as it examines household relocation decisions, future research should consider *ex ante* segregation of women into ubiquitous jobs that rarely relocate for work (for both men and women), rather than the *ex post* normative prioritization of men's careers in mobility decisions among equally mobile careers, as the primary explanation for why families tend to relocate for husbands. More broadly, research should consider how the prioritization of husbands' careers in mobility decisions affects young men and women's career paths, and how the two-body problem promotes the intergenerational reproduction of occupational segregation.

[11] There are also exceptions to the generalization that engineering and technical occupations are geographically-clustered; for example, civil engineers, accountants, and auditors are technical occupations and they are dispersed. They also have rapidly absorbed highly-educated women.

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TABLES AND FIGURES

Table 1. Most-Clustered and Most-Dispersed High-Skill Occupations in 2000

Fifteen Most-Clustered	C	Fifteen Most-Dispersed	C
Petrol & Mining Engineers	2.45	Primary School Teachers*	0.00
Aerospace Engineers	2.09	Secondary School Teachers*	0.29
Atmosphere & Space Scientists	2.05	Managers (Education)**	0.33
Physicists & Astronomers	2.02	Managers (Health Occupations)**	0.33
Actuaries	1.93	Registered Nurses*	0.36
Legislators	1.86	Other Financial Specialists	0.43
Chemical engineers	1.83	Financial Managers**	0.56
Medical scientists	1.81	Accountants & Auditors**	0.58
Metallurgical & Materials Eng.	1.75	Advertising & Related Sales**	0.59
Podiatrists	1.74	CEOs & Public Administrators	0.59
Mathematicians & Math Sci.	1.73	Vocational & Educ. Counselors*	0.60
Other Physical Scientists	1.73	Welfare Service Aides*	0.61
Actors, Directors, & Producers	1.71	Clinical Lab Technicians*	0.65
Geologists	1.66	Physicians	0.69
Business & Promotion Agents	1.63	Physical therapists*	0.69
Agricultural & Food Scientists	1.62	Clergy & Religious Workers	0.7
Biological Scientists	1.6	Pharmacists**	0.71
Airplane Pilots	1.55	Social Workers*	0.74
Mechanical Engineers	1.55	Marketing Managers**	0.78
Archivists & Curators**	1.51	Dentists	0.81

Note: *: Majority female in 1980 and 2000. **: Became majority female within 1980-2000 "C" is the normalized clustering index (otherwise 0.04 to 0.73, un-normalized), calculated in the 2000 Census. Occupations are taken from 1980 SOC Codes, excluding agriculture and military occupations. "High Skill" occupations are the seventy-seven in which where the majority of workers have bachelor's degrees.

Table 2. Logistic Regression for Probability Young Never-Married Men and Women Relocate for Work, 2003-2010

	All Workers				Bachelor's Degree Holders			
Sex:	Men	Women	Both	Both	Men	Women	Both	Both
Hypothesis:	H1B	H1B	H1C	H1D	H1B	H1B	H1C	H1D
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Clustering "C"	0.361***	0.385***		0.370***	0.411***	0.309***		0.364***
	(0.044)	(0.053)		(0.034)	(0.0730)	(0.080)		(0.054)
Female			-0.118**	-0.0407			-0.22***	-0.156**
			(0.037)	(0.038)			(0.055)	(0.056)
Constant	-4.38***	-4.45***	-3.95***	-4.39***	-3.34***	-3.37***	-2.82***	-3.27***
	(0.060)	(0.062)	(0.025)	(0.049)	(0.103)	(0.097)	(0.039)	(0.080)
LR Chi-Squared	65.4***	49.9***	10.1***	125.3***	31.3***	14.8***	15.3***	60.5***
Observations	87,943	79,736	167,679	167,679	12,501	14,737	27,238	27,238

Note: Standard errors in parentheses. Data from CPS March Supplement 2003-2010, and includes labor force participants under age of 35.

* $p < 0.05$ (two-tailed test); ** $p < 0.01$; *** $p < 0.001$

Table 3. Relative Geographic Constraint of Occupations within the Family

	All Workers		"Power Couples" Two Bachelor's Degrees	
	Share	SE	Share	SE
Two-Earner Couples				
Husband's Occupation is More-Clustered	42.7%	(0.164%)	42.9%	(0.164%)
Wife's Occupation is More-Clustered	20.9%	(0.097%)	22.9%	(0.103%)
Same Occupation	3.4%	(0.035%)	6.3%	(0.049%)
One Earner Couples				
Husband Works, Wife Does Not	23.9%	(0.106%)	23.2%	(0.104%)
Wife Works, Husband Does Not	5.2%	(0.044%)	2.9%	(0.033%)
Zero-Earner Couples	3.8%	(0.037%)	1.9%	(0.026%)

Note: Percents denote shares of households featuring the corresponding labor force circumstances. For example, 42.7% of households exhibited two earners, of which the husband worked in the more-clustered of the two occupations. Data from CPS March Supplements 2003-2010.

Table 4. Logistic Regression Estimating the Probability of Relocating for Work among Young Dual-Earner Couples

	(1)	(2)	(3)	(4)
Relative Geo. Constraint				
C of Husband's Occ	0.289***	0.269**	0.260**	0.262**
x (Husb Higher C)	(0.0820)	(0.0829)	(0.085)	(0.0865)
C of Wife's Occ	0.278**	0.259**	0.237*	0.244*
x (Wife Higher C)	(0.0891)	(0.0905)	(0.093)	(0.0947)
Heads' Difference in C	0.495	0.421	0.217	0.228
	(0.385)	(0.397)	(0.417)	(0.424)
Controls				
Family Has Child		-0.936***	-0.738***	-0.738***
		(0.0803)	(0.0827)	(0.0836)
Husband has Bachelor's			0.845***	0.849***
			(0.0983)	(0.100)
Wife has Bachelor's			0.133	0.125
			(0.0988)	(0.101)
Husband's Log-Wage				0.0829
				(0.105)
Wife's Log-Wage				-0.0566
				(0.0812)
Constant	-5.200***	-4.492***	-5.003***	-5.132***
	(0.352)	(0.361)	(0.377)	(0.563)
LR Chi-Squared	10.98**	138.5***	267.4***	261.5***
Observations	36408	36408	36408	34570
β_1 - β_2	0.011	0.010	0.023	0.018
	(0.120)	(0.123)	(0.126)	(0.128)

Note: Standard errors in parentheses. From CPS MORGs 2003-2010. β_1 - β_2 is the estimated difference in the marginal effect of clustering on relocation in dual-earners where the husband, versus the wife, has the more-clustered occupation. Includes couples where the mean age is at most thirty-five, and both spouses are present.

* $p < 0.05$ (two-tailed test); ** $p < 0.01$; *** $p < 0.001$

Table 5. Logistic Regression Estimating the Probability of Relocating for Work among Young Dual-Earner Couples, among "Power" Couples

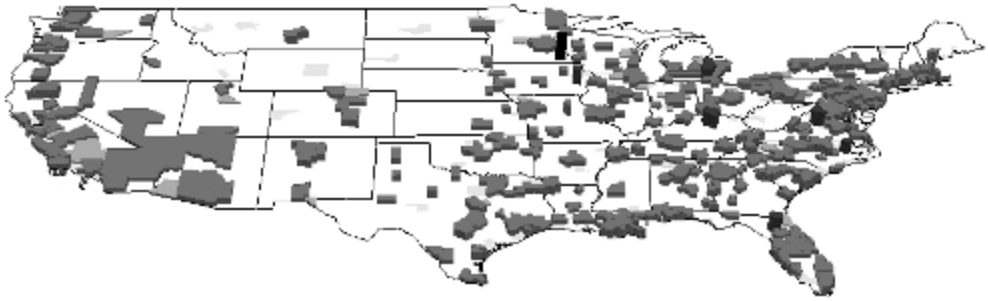
	(1)	(2)	(3)
Relative Geo. Constraint			
C of Husband's Occ	0.465***	0.419**	0.415**
x (Husb Higher C)	(0.127)	(0.128)	(0.129)
C of Wife's Occ	0.550***	0.502***	0.499***
x (Wife Higher C)	(0.142)	(0.143)	(0.144)
Heads' Difference in C	-0.923	-0.889	-0.955
	(0.632)	(0.641)	(0.647)
Controls			
Family Has Child		-0.750***	-0.745***
		(0.116)	(0.117)
Husband's Log-Wage			0.185
			(0.234)
Wife's Log-Wage			0.0624
			(0.168)
Constant	-5.545***	-4.935***	-6.038***
	(0.562)	(0.572)	(1.270)
LR Chi-Squared	15.36***	56.91***	56.29***
Observations	9,348	9,348	9,107
$\beta_1 - \beta_2$	-0.085	-0.083	-0.084
	(0.191)	(0.192)	(0.193)

Note: Standard errors in parentheses. From CPS MORGs 2003-2010. $\beta_1 - \beta_2$ is the estimated difference in the marginal effect of clustering on relocation in dual-earners where the husband, versus the wife, has the more-clustered occupation. Includes couples where the mean age is at most thirty-five, both spouses are present, and both spouses have a bachelor's degree (or higher).
* $p < 0.05$ (two-tailed test); ** $p < 0.01$; *** $p < 0.001$

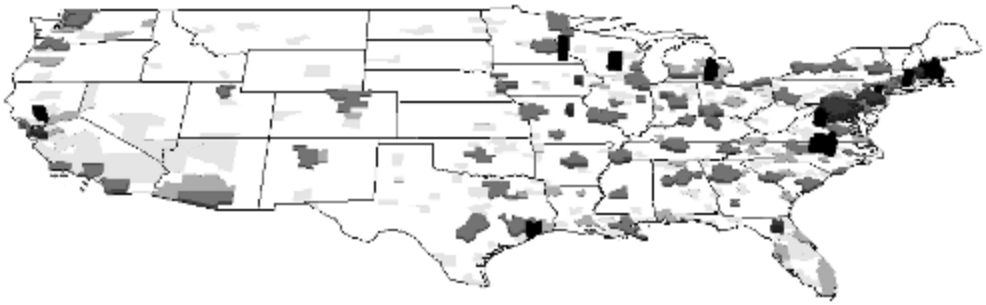
FIGURE 1

Metropolitan Workers Per Capita in Selected Occupations in 2000

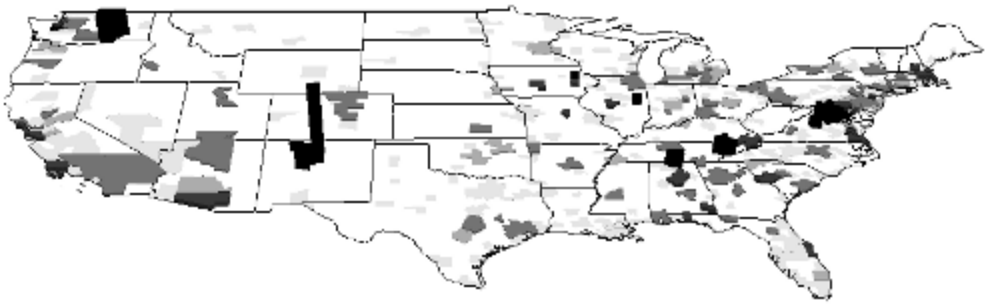
(i) Physicians and Surgeons, C = 0.69 (un-normalized, C* = 0.12)



(ii) Medical Scientists, C = 1.81 (un-normalized, C* = 0.36)



(iii) Physicists and Astronomers, C = 2.02 (un-normalized, C* = 0.45)

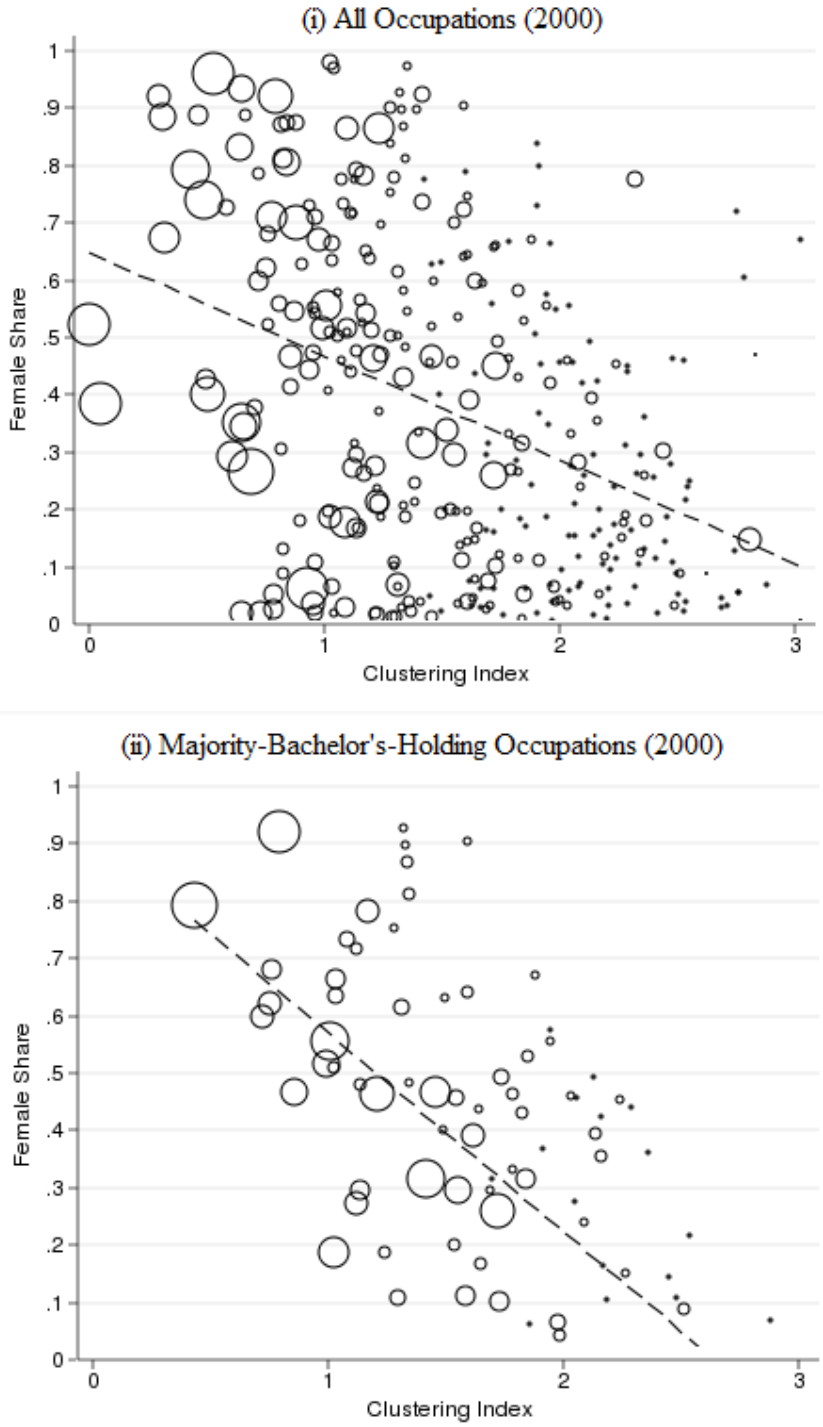


Metro Per Capita / National Per Capita

- >4
- 2 - 4
- 0.5 - 2
- 0.25-0.5
- <0.25

FIGURE 2

Scatterplots of Sex-Based Occupational Clustering versus Female Share,
By Year and Skill Level



*Note***.** Size denotes employment