Research Statement

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My current research focuses on family, gender, and education issues in labor economics. I seek to understand the balance between women's economic activities and their family life as well as children's well-being taking into account heterogeneity in socioeconomic status, with the aim of helping design effective family policies. In this statement, I summarize three papers related to maternal wages and fertility decisions and one paper on parenting. My research relies on either the quantile analysis or IV method depending on the research aim.

"The Emergence of the Motherhood Premium: Recent Trends in the Motherhood Wage Gap Across the Wage Distribution" (Job Market Paper)

The average motherhood wage gap (MWG) dramatically converged from 8 percent in 1990 to 1 percent in 2013 (Pal and Waldfogel, 2016), but it is unknown which group of earners led this declining trend in the MWG. In this paper, I analyze recent trends in the difference in hourly wages between mothers and non-mothers or the MWG, taking into account heterogeneity of the wage gap by women's wage levels. I raise a new research question as to whether the MWG equally declines for all mothers, motivated by the fact that convergence of the MWG led by high-wage mothers could be related to an increase in wage disparity among mothers. I apply the unconditional quantile regression (UQR) method (Firpo, Fortin and Lemieux, 2009) to the Current Population Survey (CPS) for years 1990 through 2017 to estimate the distribution of the MWG over time.

I find that trends in the MWG are heterogeneous with respect to wage level. The MWG greatly declines in the mid-1990s, especially for high-wage mothers, and the MWG below the median decreases less than the average. High-wage mothers receive more wages than non-mothers, known as the motherhood premium, from the mid-1990s. This heterogeneity unmasks the simple convergence story. Even though the average wage gap between mothers and non-mothers has declined over time, the heterogeneous evolution of the MWG over the wage distribution may have ultimately resulted in increased wage disparity among mothers.

This broad analysis of the MWG trends does not address the causal effect of children on the gap. Instead, I investigate how the wage gap between mothers and non-mothers evolves over the wage distribution, and explore several possible explanations for the heterogeneous evolution along each of various dimensions: changes in marriage, fertility timing, and overwork. The aim of this analysis is to better understand the declining trend in the MWG and women's fertility trend. The heterogeneous convergence of the MWG is related to an increase in wage inequality among mothers. In addition, the emergence of the motherhood premium reveals that negative selection

into motherhood has been reversed for high-wage earners, implying that high wages before childbearing do not necessarily mean high opportunity costs of childbirth. This paper is significant in that it uncovers hidden phenomena behind the converging MWG.

The findings regarding the heterogeneous trends in the MWG and the changes in characteristics of mothers stimulate several follow-up research questions. The following two papers in this statement are motivated by my job market paper.

"The Effect of the Motherhood Wage Gap on First Birth Decisions"

This paper analyzes the impact of the expected motherhood wage gap (MWG) on women's fertility decisions. A long-standing consensus is that high wage earners are likely to delay their first birth because of the high opportunity cost of childbearing. This paper suggests that women's wage changes after childbirth are an important factor in fertility timing, instead of the wage level before giving birth. I first present a 3-period optimal stopping model which shows how a woman's first birth timing is determined by her expected MWG. Under this theoretical framework, I empirically estimate the MWG by quantiles of the conditional wage distribution in the CPS data. Using the quantile-level MWG, I estimate the effect of the expected MWG on the probability of a first birth, controlling for quantile and individual fixed effects. I basically use a quantile-level variation in the expected MWG, and address the individual heterogeneity in each quantile by controlling for individual fixed effects using the two-period CPS panel data. I find that a 10 percent increase in a woman's expected MWG reduces the probability of her first birth by 2.2 percentage points. The negative effect of the MWG on the probability of a first birth is larger for high wage and more educated women. This paper's results imply that reducing the MWG could increase both women's economic activities and their likelihood of having children at a younger age.

"Women's Overwork and the Motherhood Wage Gap: Evidence from the Effect of Low-Skilled Immigration"

This paper provides causal evidence that maternal overwork—paid work exceeding 50 hours a week—reduces the motherhood wage gap (MWG). In my job market paper, I found that an increase in mothers' overwork was a probable reason for the great convergence of the MWG of high-wage mothers. Motivated by my job market paper, this research provides evidence on the causal relationship between maternal overwork and the MWG. I exploit exogenous variation in low-skilled immigration which reduces the costs of women's overwork. Using the famous "enclave instrument" and the 5 percent censuses of 1980, 1990 and 2000, and the 5-year aggregate American Community Survey of 2011, I investigate the effect of low-skilled immigration on the MWG at the individual and city levels. In the individual-level analysis, I estimate the effect of low-skilled immigration on the probabilities of overwork and hourly wages of mothers and non-

mothers by wage level. The city-level analysis estimates the relationship between the proportion of overworking women and the MWG in each year and city. I find that when the costs of women's overwork decrease, high-wage women (both mothers and non-mothers) are more likely to increase their probabilities of overwork than low-wage women, and mothers' wages increase more than non-mothers' wages in the same wage group. The results of the city-level analysis are consistent with the individual-level results. A city with more overworking women has a smaller MWG at the upper wage quantiles than a city with fewer overworking women.

"How Do Children's School Experiences Affect How They Are Parented? Evidence for the U.S." with Elizabeth T. Powers

Parenting is a crucial determinant of children's well-being and development. In joint work with Elizabeth T. Powers, we estimate the causal effect of children's school tenure on parenting, as measured by four parenting indices and their components: affection, practices, parenting stress and positive behavioral control. We exploit exogenous variation in public-school entry age using the school-eligibility-cutoff date in each year and state. We accumulate large samples of children for the analysis by pooling multiple panels of the Survey of Income and Program Participation (SIPP). Our IV results show that early school experiences significantly improve two domains of parenting, affection and behavioral control, but the effects fade away by middle school. Effects of schooling are heterogeneous by child age, birth order, race, sex, and household socioeconomic status. Increased early schooling improves parenting quality more for lower-SES households, despite the fact that these parents sometimes experience increased parenting stress. Given the potential importance of parenting quality in child well-being and social mobility, our findings suggest that it is necessary to expand formal educational experiences for younger children.