

# Money, childbearing, gender: explaining within-couple inequality after parenthood

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## *Abstract*

Using population register data for the Netherlands, we analyze the child penalty for new parents in three groups of couples: different-sex and lesbian couples with a biological child and different-sex couples with an adopted child. With a longitudinal design, we follow parents' earnings from 2 years before to 8 years after the arrival of the child and use event study models to estimate the effects of the transition to parenthood on earnings trajectories. Comparing different groups of couples allows to test hypotheses related to three types of difference that are early impossible to disentangle when studying only heterosexual biological parents: relative earnings, childbearing and gender. Our results offer strong support for gender as the main driver of divergent child penalties: for mothers, the gender of their partners is more consequential for their earnings trajectories than going through pregnancy or being a secondary earner before parenthood.

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This work is funded by the European Research Council (ERC) under the European Union's Horizon 2020 research and innovation programme, ERC Consolidator Grant (No 771770) to principal investigator Marie Evertsson. The research was conducted in part using ODISSEI, the Open Data Infrastructure for Social Science and Economic Innovations.

## 1. Introduction

The transition to parenthood is a turning point for the household division of labor a major determinant of the level and trends in gender inequality. A substantial body of research shows that the birth of a child increases inequality within different-sex couples, as mothers bear the brunt of unpaid work, take longer parental leaves and are more likely to work part-time or drop from the labor force altogether (Baxter, Hewitt, and Haynes 2008; Evertsson and Boye 2016; Grunow, Schulz, and Blossfeld 2012; Musick, Bea, and Gonalons-Pons 2020; Yavorsky, Kamp Dush, and Schoppe-Sullivan 2015). The unequal effects of parenthood are clear in the earnings trajectories of new parents: five years after becoming mothers, women in heterosexual couples across several countries earn 21% to 61% less than predicted by their pre-parenthood income; while fathers are barely affected or even enjoy a fatherhood premium (Kleven et al. 2019; Rabaté and Rellstab 2022).

While outcomes are clearly gendered, it is less clear the extent to which underlying mechanisms rely on gender versus other partner attributes — and, more importantly, differences in partner attributes — that might overlap with or be highly correlated with gender. In fact, supply-side explanations of the division of labor of parents have highlighted three types of within-couple *differences* that map into within-couple *inequality* following parenthood. (1) fathers usually have better labor market prospects than mothers, so the divergence in earnings trajectories is driven by efficient economic specialization; (2) childbearing, and the cultural meanings attached to it, make mothers better suited or more committed than fathers to child-care; (3) the division of labor of new parents reflects the performance of gender. However, it is difficult to disentangle these three dimensions when studying only different-sex biological parents, because, to the extent that most women earn less than their partners, they lead to the

same empirical prediction: any negative effects of parenthood on labor market outcomes will be stronger for mothers than for fathers.

What happens, then, when differences in partners attributes do not align or one of them is entirely absent? In this paper, we address this question by comparing the earnings trajectories of new parents in three groups of couples in which gender, childbearing and income are inter-related in various ways: (1) different-sex and (2) female same-sex couples who have a biological child and (3) different-sex couples who adopt a child. Different- and same-sex biological parents have in common the fact that one partner goes through pregnancy, but only in the former the partners differ in gender. Biological and adopting different-sex couples, on the other hand, have the same gender composition but differ in whether the mother gives birth. By comparing these couples in the same institutional context and further considering the relative economic position of partners before the transition to parenthood, we are able to better understand how economic considerations, childbearing and gender to the divergence in earnings of new parents.

We use rich administrative data covering the full population of the Netherlands, which provides us with high-quality longitudinal information and unusually large samples of adoptive and same-sex first-time parents. We follow earnings of parents in a 10-year window around the arrival of a child and employ an event-study design to estimate the child penalty — i.e. the cost of parenthood in earnings — for each type of parent. The child penalty serves as a summary measure of labor market outcomes, because the change in earnings might be due to both supply-side (e.g. change in working hours) and demand-side mechanisms (e.g. discrimination in hiring or promotions). Our study adds to broader literature uncovering longitudinal developments across the transition to parenthood, as well as to a smaller body of research that has

explored these developments for same-sex and adoptive couples (Evertsson, Moberg, and Van der Vleuten 2022; Rosenbaum 2021; Kleven, Landais, and Sjøgaard 2021; Andresen and Nix 2022).

## **2. Background and theory**

### **2.1. Parenthood and division of labor in same-sex and adopting couples**

We start with discussion of the transition to parenthood for same-sex and adoptive couples, with special attention to the Dutch context. We focus on different-sex adopting couples (adopting DSC) and female same-sex couples who have a biological child (FSSC). For FSSC, the path to biological parenthood involves either private insemination or medically assisted reproduction techniques, such as in vitro fertilization (IVF). In the Netherlands, medically assisted reproduction is available for all women, so FSSC were never excluded from it, though regulatory changes in 2002 and 2014 made it easier for social mothers to be recognized as legal parents when the sperm donor is unknown (Evertsson, Jaspers, and Moberg 2020). Furthermore, the basic, mandatory health insurance covers the first three attempts of IVF for each women, which means that a female same-sex couple might be reimbursed for up to six attempts. Thus, the Dutch context offers relatively low institutional barriers for lesbian parenthood, even though it might still take long and require intensive planning.

Much like for couples going through medically assisted reproduction, parenthood is highly anticipated by adopting couples. Because adoption can be a slow and expensive process, especially when the child is adopted from abroad, adopting couples are selected on both income

and desire for becoming parents. Intercountry adoptions were suspended by the Dutch government in 2021, but before that they accounted for more than 90% of children adopted in the Netherlands and the entire process could take up to 6 years and cost tens of thousands of Euros (Adoptievoorzieningen n.d.; CBS Statline 2014). Thus, both lesbian and adoptive couples tend to be highly selected by desire for parenthood, with the latter also being selected by income.

When it comes to family leave rights, Dutch regulations make no distinction regarding the gender composition of couples, but it does differentiate between births and adoptions. Between 2005 and 2012, when the couples in our sample became parents, an employed woman who gave birth was entitled to 16 weeks of maternity leave, paid at 100% of earnings up to a ceiling. Self-employed women were not eligible at the start of this period, but later became entitled to the same length of maternity leave, paid up to the minimum wage. The employed partner of the birth mother, or another person who acknowledged the child, was, irrespective of gender, entitled to two days of paid leave. In the case of adoption, on the other hand, each parent was entitled to four weeks of leave, paid at the same rate as maternity leave. Therefore, leave policies facilitate an equal commitment to childcare at the early stages of adoptive parenthood. Parental leave, which can be taken until the child is eight years old, is the same for all types of parents: it is unpaid and, between 2005 and 2012, varied from 13 to 26 times the number of weekly work hours (Groenendijk 2005; Groenendijk and Keuzenkamp 2012).

With regards to the division of labor, research spanning several countries has established that same-sex couples more often have dual full-time employment, have more similar earnings and working hours, and share household tasks more equally than different-sex couples (e.g. Bauer 2016; Giddings et al. 2014; Jaspers and Verbakel 2013; Solomon, Rothblum, and Balsam 2005; Van der Vleuten, Jaspers, and van der Lippe 2021). When considering both

parents and non-parents, the lower levels of inequality in same-sex couples are partially explained by the fact that they are less likely to have children. But same-sex couples are more equal even when they are parents. For example, in the Netherlands, the presence of children increases inequality in working hours for heterosexual, lesbian, and (male) gay couples, but the effect is much weaker for lesbian couples (Jaspers and Verbakel 2013). In Sweden, lesbian couples share parental leave more equally than different-sex couples (Evertsson and Boye 2018). A few recent studies, all of them focusing on the Nordic countries, have compared the child penalty in different-sex and lesbian couples (Andresen and Nix 2022; Evertsson, Moberg, and Van der Vleuten 2022; Moberg 2016; see also Rabaté and Rellstab 2022). These studies found that birth mothers in lesbian couples face weaker penalties than their heterosexual counterparts, while social mothers face stronger penalties than fathers.

Research on the division of labor in adopting couples is scarcer. Both partners in these couples are usually highly involved in the process of becoming parents (Goldberg 2010; Goldberg, Smith, and Perry-Jenkins 2012), which could lead to equal levels of commitment to child-care and, thus, similar earnings trajectories. However, the available empirical evidence suggests that transitions to parenthood can be as gendered in different-sex adopting couples as in their biological counterparts. The few studies comparing earnings trajectories for the two types of couples — again, all of them using Nordic countries' register data — found very similar child penalties for both sets of mothers, and lack thereof for fathers (Andresen and Nix 2022; Kleven, Landais, and Sjøgaard 2021; Rosenbaum 2021).

## 2.2. Why does gender inequality increase following parenthood?

### 2.2.1. *Economic specialization*

Explanations for the divergent effects of parenthood in the labor market outcomes of men and women are closely connected to the extensive literature about the household division of labor (for recent reviews, see Perry-Jenkins and Gerstel 2020; Sullivan 2021). We focus here on perspectives that are pertinent to within-couple differences in involvement with childcare vis-a-vis labor market work, because the need for caring for a child is, by definition, the key change in household organization when couples become parents. Though we acknowledge that economic considerations, the biological circumstances of childbearing, and the performance of gender are intertwined both in theory and in practice, our hypotheses are mutually exclusive: they predict the patterns that would be observed if each of the three sources were the main driver of (divergent) child penalties.

The first perspective highlights the role of financial considerations in couples' decision-making and is associated with the economic theory of the family, more specifically Becker's (1991) specialization model. In this framework, it is in the best interest of couples to maximize their joint utility by exploiting comparative advantages, so that each partner focuses on the type of work — paid labor or home production — in which she or he is the most productive. Having children would only increase the incentives for this sort of efficient specialization, as the amount of work at home surges. According to this formulation, specialization is gender-neutral

in the sense that, as argued by Becker, it does not depend on intrinsic differences between men and women (for further discussion on this formulation, see England and Budig 1998; Blossfeld and Drobnic 2001; Grunow 2021). The traditional, i.e. gendered, division of labor, including the work and care practices of new parents, relied on the empirical fact that women usually had invested less in human capital and had worse labor market prospects than their male partners. It follows that, whenever mothers have higher earnings (or earnings potential) than fathers, the direction of specialization should be reversed. Empirical evidence has generally provided little support for the specialization model: most different-sex parents do not efficiently specialize when the mother has higher earnings or is more educated than the father (Grunow 2021; Van Bavel, Schwartz, and Esteve 2018; Kuhhirt 2012). Nevertheless, it is still important to consider this perspective in our framework. Same-sex and adoptive parents offer a stronger test for economic specialization, as within these couples any financial considerations do not overlap with, respectively, gender differences and the biological circumstances of childbearing.

If inequality within-couple inequality following parenthood is driven mainly by couples maximizing their joint income, we expect trajectories of parents to diverge based on the relative earnings observed before the child's arrival. In other words, whoever makes less money in paid work before the arrival of a child, irrespective of being the (birth) mother or her partner, will focus relatively less on paid work after parenthood. Thus, our first hypothesis (H1) for the earnings trajectories of new parents is: *in all types of couples, the child penalty is stronger for the partner with the lowest earnings pre-parenthood.*

Note that another common perspective on the household division of labor, the economic dependency or relative resources model (Gupta 2007), highlights how relative earnings are related to couple's division of *housework*. In this model, relative earnings matter not because



of economic efficiency, but because they are a measure of bargaining power: better labor market prospects let partners buy out of housework. This rests on the (reasonable) assumption that most people want to do as little housework as possible. But, as other researchers have pointed (Sullivan 2013; Evertsson and Boye 2018), childcare is generally seen as a more pleasant and rewarding activity than housework, so its not clear whether the same bargaining dynamics would apply in the transition to parenthood.

### 2.2.2. *Childbearing*

Another possible basis for unequal work-care practices of parents — and thus divergence in their earnings trajectories — is that, on a practical level, the transition to (biological) parenthood affects partners very differently: biological mothers, but not their partners, go through months of pregnancy, must recover from birth, and might breastfeed for months if not years. Both economic and socio-psychological perspectives have highlighted the role of biological aspects of parenthood to couples' division of labor. Indeed, Becker's original formulation of the specialization model strongly emphasized biology as a basis of role differentiation in families: though men's advantage in the labor market appears as a logical complement, he argued that women have a comparative advantage at home production due to childbearing and are strongly committed to childcare because "they want their heavy biological investment in production to be worthwhile" (Becker 1991, 37–38). Childbearing, then, seems to be as central as earnings potential to efficient specialization, which makes Becker's argument certainly not gender-neutral.

From a socio-psychological perspective, on the other hand, childbearing might be source of within-couple differentiation is by drawing on identity formation processes and the extent to which the motherhood identity is connected to giving birth. Although roles, or behavioral expectations, are certainly not fixed, prevailing cultural norms of parenthood often associate good mothering with sacrificing for the children and catering to their needs; whereas good fathering seem less well-defined and, though it increasingly includes being highly involved in child-care, does not entail being the primary caregiver (Collett, Vercel, and Boykin 2015; Evertsson and Boye 2018; Fox 2008; Gaunt and Scott 2014; Killewald 2013; Nuttbrock and Freudiger 1991). While they also draw on broader gender-essentialist notions, the distinct expectations regarding motherhood, especially when children are very young, are often cast as resulting from childbearing.. First-time parents in different-sex couples often justify unequal work-care practices by arguing that the baby is more comfortable with the mother, and contrasting a “natural” mother-child bond related to pregnancy and breastfeeding to the slow building of a relationship between father and child (Grunow and Evertsson 2019). In this perspective, the biological circumstances of having a child may structure the division of labor of new parents because they are a source not of efficiency, but of parental norms and identities that assign very different roles for mothers and fathers.

If childbearing is the main determinant of within-couple inequality, we expect biological mothers in both different- and same-sex couples to face stronger penalties than adoptive mothers partnered with men. Similarly, fathers in adopting couples should be more involved in childcare, and face more negative consequences for earnings, than the partners of birth mothers. These empirical predictions are compatible with both the economic and the socio-psychological views of the effects of childbearing on the work-care arrangements of new parents. Thus.

taking childbearing as the key driver of the child penalty leads us to the second hypothesis (H2): *birth mothers in both FSSC and DSC have stronger child penalties than adoptive mothers; while social mothers and fathers in biological DSC have weaker penalties than adoptive fathers* (H2).

### 2.2.3. Gender

A final explanation is that within-couple inequality following parenthood is the result of couples “doing gender”. In this perspective, gender categories are continuously recreated in social interaction, and one way of enacting the male and female identities is by performing gender-stereotypical tasks (West and Zimmerman 1987; see Ridgeway 2011 for a similar interactionist approach). The gendered household division of labor might be interpreted as a prime example of this performance, as housework and childcare are considered more feminine activities while paid work is more central to masculinity (Brines 1994; Poortman and van der Lippe 2009). In other words, the doing gender approach explains the divergence in labor market outcomes of mothers and fathers by pointing out that the household division of labor is important way of enacting the gender categories in the first place: the unequal division of care and paid work “creates” gender as much as the other way around.

Therefore, if gender is by itself the main determinant of within-couple inequality, child penalties should vary the most as a function of the gender composition of couples. Gender norms about parenthood should not be a source of within-couple inequality for female same-sex parents, and they might even be engaged in “undoing gender” (Goldberg 2013). On the other hand, different-sex adoptive parents are subject to the same gender norms as their biological counterparts and can tap into similar gendered parenthood scripts. Our third hypothesis

is then: *the child penalty will be similar for biological and adoptive mothers in different-sex couples, and in both cases stronger than for birth mothers in lesbian couples.*

### **3. Data and method**

#### **3.1. Sample construction**

We use Dutch register data from the System of Social Statistics Datasets (SSD) of Statistics Netherlands (Bakker, van Rooijen, and van Toor 2014). The SSD covers the entire registered population of the Netherlands and the datasets containing a wealth of information on individuals, households and much more can be linked by unique identifiers. In this study, we rely on several registers to identify couples' transitions to parenthood via birth or adoption and trace the earnings trajectories of each parent. We focus on couples who become parents between 2005 and 2012 due to the availability of the relevant data. First, we rely on annual income data that covers the period from 2003 to 2020, so we define 2005 as the lower limit for the births and adoptions in order to observe the parents' earnings for at least two years before the arrival of the child. Second, records are available for adoptions occurred between 1995 and 2012. We can observe transitions to parenthood occurring after that period and link (most) children born in the Netherlands to the birth mothers, but we cannot clearly identify adoptions and thus choose to restrict our sample to a common period for all types of parents. Therefore, we define 2012 as the end of the observation window for the transitions and follow couples' earnings for 8 years after they became parents.

We start by identifying all children who were born or adopted in the Netherlands between 2005 to 2012. To compare biological and adoptive parents with similar childcare demands, we exclude adopted children who were more than 3 years old at the time of adoption. The children are then linked to different-sex or lesbian couples who included at least one legal parent and in which both partners were 20 to 55 years old in the year of transition to parenthood. We only consider the transitions to have occurred to a couple — rather than to a single parent — if the partners are living together before or within six months of the child’s birth or adoption. We restrict our sample to couples experiencing only one event — either a birth or an adoption — in a given calendar year. We further restrict our sample to first-time parents by excluding couples in which either partner had older (legal) children, irrespective of co-residence. Adoptions by female same-sex couples are also excluded from the sample, as the number of cases is very small. The basic municipal register files only record legal parent-child relationships, so we rely on data from the Perinatal Registration, which links births to mothers, to confirm the presence of the birth mother in couples and to distinguish between birth and social mothers in same-sex couples. Although we sometimes speak of biological parents when referring to (different-sex and same-sex) couples who experience a birth, this only means that the couple is formed by the birth mother and her partner. We cannot ascertain the biological relatedness of fathers — neither, in fact, of “social” mothers in same-sex couples, as reciprocal in vitro fertilization allows couples to use the eggs of the non-birth mothers. So the “biological” parents might include, for example, a birth mother and step-father if they start living together no later than six months after the child’s birth.

There are no restrictions on the formal status of the parent’s union, so couples might be cohabiting, married or in a registered partnership at the time of the child’s arrival.<sup>1</sup> We also do not select cases based on subsequent family transitions — e.g. new children, union dissolution — but in the Online Supplement we present additional results accounting for the arrival of a second child. Finally, our main analyses are based on a balanced panel, so we only consider couples for which (1) the child is living in the Netherlands every year from birth or adoption to eight years later; (2) both partners are living in the Netherlands (not necessarily together) and have non-missing income information for every year from two years before to eight years after the transition to parenthood. Our full sample consists of 456,572 different-sex and 1,381 female same-sex couples who have a biological child, and 2,022 different-sex couples adopting a child.

### 3.2. Measures

We use annual income information compiled by Statistics Netherlands from tax registers and that includes people with zero income. Because we are interested in parent’s paid work, the outcome variable in our models is the *labor earnings* of individuals, comprising income from employment and self-employment. For the matching procedure described in the next section, we use the *individual gross income*, as it better captures the overall financial resources of

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<sup>1</sup> To identify two people as cohabiting couple, Statistics Netherlands relies on legal or administrative ties — other than marriage and registered partnership — that point to a partnership. These include, among others, being listed as partners in tax fillings, pension schemes and (mandatory) health insurance, as well as being the legal parents of a child. The criteria also apply retrospectively, so that, for example, two people who start living together in 2010 and establish a legal relationship indicating partnership (e.g. marriage, becoming legal parents of a child) in 2012 will be considered to have been a couple since 2010. Therefore, all couples included in our sample have some sort of connection suggesting a committed relationship. For example, a woman who gives birth while living with a roommate with whom she has no ties that indicate a partnership — co-signing a rental agreement would not be enough — is not considered as being in a couple.

parents. Besides earnings, the gross income includes social security benefits and transfers — except for benefits, transfers and other sources of income assigned to households rather than individual household members. In both variables, values are originally top coded at 1 million euros and we recode negative values — indicating net losses for business owners and the self-employed — to zero. Finally, we adjust all monetary values to 2015 euros using the Consumer Price Index (CPI) (Statistics Netherlands 2022).

We also use the tax register data to create a binary indicator for whether the main source of an individual’s earnings was *self-employment* in either of the two years before parenthood. We classify individuals into six *parent types* defined by being the (birth) mother or her partner in one of the three *couple types* (birth mother in FSSC, social mother in FSSC, mother in biological DSC, etc). Both *calendar year* and *age* are used as categorical variables in the event study models, and the latter is measured as the age completed in the year of the child’s arrival. We do not use education in our analyses because this information is missing from the administrative registers for up to one third of parents, especially for older cohorts who left the educational system before Statistics Netherlands started compiling educational records for the full population. However, we present descriptive statistics on education by parent type in the online supplement.

### 3.3. Matching

The three types of couples included in our analyses can be very different from each other when becoming parents, and in ways that might influence their subsequent earnings trajectories. Some differences between same-sex and different-sex parents might be due to

patterns of assortative mating (cf. Schwartz and Graff 2009; Verbakel and Kalmijn 2014), but the distinct pathways to parenthood also create considerable variation in sociodemographic characteristics across couple types. The road to parenthood is usually much longer for same-sex and, especially, adoptive parents, so they are on average older than their different-sex biological counterparts at the time of child's arrival. Adoptive parents are also highly selected on income because of the financial costs of the adoption process. Therefore, the effect of parenthood might vary across types of couples in part because they were already very different from each other at the time of child's arrival.

In order to compare couples who are as similar as possible in their pre-parenthood characteristics, we follow previous research in adopting a matching procedure (Andresen and Nix 2022; Evertsson, Moberg, and Van der Vleuten 2022). Matching is a non-parametric way of adjusting for confounding variables by creating "treatment" and "control" groups with similar distributions of those variables, and it is often used as pre-processing for the estimation of treatment effects with observational data (Ho et al. 2007; Stuart 2010). We use couples as units and create two separate matched samples: one with same-sex couples and the other with adoptive DSC as treatment groups, with the control group consisting of biological DSC in both cases. In other words, for each same-sex or adoptive couple, we aim to select appropriate matches from the larger pool of biological different-sex parents. More specifically, we use coarsened exact matching (CEM), a method that matches treatment and control units that have the same values on covariates, using grouped (i.e. coarsened) versions of the continuous ones. We match couples on seven variables, namely year of child's arrival and three characteristics of each partner: age at the year of birth or adoption (15 groups); average of the gross personal



income in the two years before parenthood (100 groups); and the binary indicator for self-employment described above.

### 3.4. Event study models and child penalty

To estimate the child penalty, we use event study models, which, following the work of Kleven, Landais, & Sjøgaard (2019), have become a standard tool for analyzing changes in labor market outcomes following parenthood (Andresen and Nix 2022; Evertsson, Moberg, and Van der Vleuten 2022; Kleven, Landais, and Sjøgaard 2021; Musick, Bea, and Gonalons-Pons 2020; Rabaté and Rellstab 2022; Rosenbaum 2021). These models capture change in the dependent variable around a given “event” through coefficients for the time relative to the event (*event time*) while controlling for other sources of temporal variation (namely, age and calendar time). Here, the event of interest is the arrival of a child by birth or adoption and the event time varies from -2 to 8 years. Our basic model can be written as follows:

$$\begin{aligned}
 y_{it} = & \sum_{j \neq -1} \sum_p \alpha_{jp} \cdot I[j = t, p = \text{parent type}_i] + \sum_p \beta_p \cdot I[p = \text{parent type}_i] \quad (1) \\
 & + \sum_a \sum_g \gamma_{ag} \cdot I[a = \text{age}_{it}, g = \text{gender}_i] \\
 & + \sum_k \sum_g \delta_{kg} \cdot I[k = \text{year}_{it}, g = \text{gender}_i] + \varepsilon_{it}
 \end{aligned}$$

where  $y_{it}$  measures the earnings of individual  $i$  at event time  $t$ . The  $\alpha_{jp}$  parameters capture the event time effects for each parent type, with the year before the transition to parenthood (-1) as the reference category;  $\beta_p$  accounts for differences in earnings levels by type of parent;  $\gamma_{ag}$

and  $\delta_{kg}$  are gender-specific age and calendar year fixed-effects (i.e. age and year are included as categorical variables).

We are interested in the  $\alpha_{jp}$  parameters, i.e. in how earnings of parents vary as a function of time relative to the transition to parenthood, net from age and period fluctuations. In their absolute scale (2015 euros), these effects might be difficult to compare because the earnings levels vary between types of parents, and especially so between men and women. Therefore, again following Kleven, Landais, & Sogaard (2019), we define the penalty as  $P_{jp} = \frac{\hat{\alpha}_{jp}}{E[\hat{y}_{it} | j=t, p=parent\ type_i]}$ . More specifically, the denominator in the previous formula is obtained by first predicting earnings for all observations using the main effects of parent type and the gender-specific age and year effects (i.e., parameters  $\beta_p$ ,  $\gamma_{ag}$  and  $\delta_{kg}$  in Equation 1) and averaging by event time and parent type. The child penalty can be interpreted intuitively as the percentage difference, at each event time, between the observed earnings and the earnings predicted for someone of the same gender, age, and pre-parenthood earnings.

## 4. Results

### 4.1. Descriptive statistics

Table 1 shows descriptive statistics for the full and the two matched samples. Beginning with the full sample, we highlight a few characteristics that help illustrate how the three types of couples differ at the time of the first child’s arrival. First, different-sex biological parents are the youngest, with the mothers in these couples being the only group with an average age below 30 at the transition to parenthood. Adoptive parents, on the other hand, have the latest transitions, which reflects their longer road to parenthood: on average, the mother is 36.6 and

the father is 38 years old at the time of adoption. Lesbian couples are somewhat in the middle with both mothers being close to 34 years old, on average, at the transition. Previous research for the Netherlands (Jaspers and Verbakel 2013; Verbakel and Kalmijn 2014) has shown that, when pooling couples with and without children, the average age gap is wider in same-sex than in different-sex couples. The fact that we find the opposite by only considering parents suggests that the association between age similarity and the likelihood of having children is stronger among same-sex couples.

Lesbian mothers are also very similar when it comes to income before birth, which contrasts with the significant gap in the pre-parenthood income of mother and fathers in different-sex couples.<sup>2</sup> As an indication of how selective the adoption process is, adoptive parents have considerably higher joint income than other couples. In fact, the average pre-parenthood income of adoptive fathers is 34% higher than that of biological fathers, the second highest earners. On the other hand, the two types of fathers are similarly likely to be self-employed, and more so than all groups of mothers. In the online supplement, we show that female same-sex parents have the highest educational achievement among all parents.

(Table 1 about here)

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<sup>2</sup> Note that the shares shown in Table 1 refer to earnings, while the absolute income levels refer to gross income (see Data and Method for definitions). Nonetheless, the relative contribution of (birth) mothers is virtually identical when considering gross income.

A comparison between the statistics of the full and the matched samples in Table 1 shows that the matching procedure was successful in achieving covariate balance while retaining sufficient sample sizes. For both mothers and fathers in biological DSC, the average age at birth is higher in the matched than in the full sample. Matching to FSSC also raises the average income of mothers in biological DSC, while decreasing the income of fathers. Thus, within-couple differences in age and income are, just like in lesbian couples, very small in the biological DSC included in the first matched sample. Matching to adopting DSC, on the other hand, selects biological parents who, on average, are older and have larger within-couple income gaps than in the full sample. Finally, note that matching reduces the prevalence of self-employment for all types of parents, while also making it virtually identical in the relevant pairings. In both matched samples, we achieve covariate balance: the mean difference between treatment and control groups is statistically insignificant for all the seven matching variables. In summary, the couples in each matched sample are almost identical in the selected pre-parenthood characteristics, which ensures that these characteristics do not explain observed differences in the trajectories following parenthood.

(Figure 1 about here)

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The similarity in pre-parenthood characteristics of matched couples is further illustrated by Figure 1, which presents the descriptive earnings trajectories for each type of partner in the full and matched samples. In the latter, the earnings of paired parents (e.g. adoptive and biological fathers) are almost indistinguishable in event times -2 and -1. This figure also anticipates descriptively the main patterns obtained with the event study models and presented in the next section.

#### 4.2. Child penalty estimates

Figures 2 and 3 plot the child penalty in earnings for each type of parent as a function of time relative to birth or adoption. Results shown in Figure 2 are from a model that interacts the event time indicators with parent type and the three brackets of mother's share of earnings before the arrival of the child. This model was estimated for the full (unmatched) sample and allows us to test our first hypothesis, which concerns the role of relative earnings pre-parenthood. Figure 3, on the other hand, plots the results from the basic model shown in equation 1, estimated separately for each matched sample. Recall that the penalty is simply a rescaled version of the event time coefficients: with the scale parameter being the average earnings predicted at each event time considering only the gender-specific age and year variation.

(Figure 2 about here)

Before addressing our hypotheses, we highlight a few general patterns in the estimated penalties. First, there is barely a fatherhood penalty for men in either biological or adopting couples. In the full sample (Figure 2), biological fathers who earned more than their partners before parenthood have a penalty of about 3% throughout the observation window. In the matched samples (Figure 3), men actually enjoy a premium: for biological fathers in the first matched sample, this premium is very small and only appears later in the period; but both sets of fathers in the second matched sample experience an increase in earnings from year 2, with the premium reaching 10% in year 5 and about 20% in year 8.

On the other hand, all mothers experience a penalty to some extent, and it shows no sign of a rebound: after it arises, the child penalty for *all groups of* women either remains stable or gets worse over time. Note that this does not mean that women's real earnings only decrease or stagnate after parenthood. What Figures 2 and 3 show is that, within our observation window, Dutch mothers never narrow the gap between their real earnings and what they were expected to make in the absence of children. In most countries for which similar estimates are available, the penalty for women weakens over time (Evertsson, Moberg, and Van der Vleuten 2022; Kleven et al. 2019), but a pattern of stability similar to what we find has been documented for the U.S. and the U.K. (Kleven et al. 2019). Also note that effects appear mostly beginning in year 1, which is likely the result of two factors: events occurring in later months (e.g. a birth in December) should have a smaller impact in the earnings received in year zero and the fully paid leave offers protection against loss of earnings in the first weeks of parenthood.<sup>3</sup>

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<sup>3</sup> The distribution of events across calendar months is very similar for all types of couples (see online appendix).

(Figure 3 about here)

To address our first hypothesis, we look at how the child penalty varies depending on the (birth) mothers' share of pre-parenthood earnings, as shown in Figure 2. This analysis relies on the full sample because it does not entail comparisons across the three groups of couples: we are interested in whether the strength of child penalty *within*, e.g., different-sex biological couples, corresponds to the past earnings contribution of parents. In other words, do couples “efficiently” specialize by having the partner with the lowest earnings take a bigger hit, proportionally, in their income?

The loss of earnings for mothers in both biological and adoptive DSC is indeed smaller when they make more money than their partners before parenthood. For example, after five years the adoptive mother's penalty stabilizes at about 27% when they are the primary earners and at about 42% when they are the secondary earners. As described above, fathers in biological DSC face a small and stable penalty when they are the primary earners, while their counterparts in adoptive DSC seem to have small, temporary penalties in both scenarios, but which nonetheless are not statistically different from zero. And although the earnings gap pre-parenthood is usually very small FSSC, being the primary earner also has a protective effect for birth mothers in those couples, to the point that their penalty is not statistically different from their partners' when they make more money before birth. These results show that being the primary earner mitigates (birth) mothers' disadvantage, but, at least in different-sex

couples, it does not come close to eliminating, let alone reversing, the gap between their and their partners' penalty. It is thus clear, that, in line with previous research, there is no sign of earnings-based efficient specialization in heterosexual couples, which leads us to reject the first hypothesis.

Turning to the results for the matched samples in Figure 3, we assess the role of the biological circumstances of the transitions to parenthood by comparing the child penalty for parents in adoptive couples to their biological counterparts. First, adoptive mothers do not have weaker penalties than biological mothers. In fact, women in both sets of different-sex couples have statistically indistinguishable trajectories after the arrival of the children. If anything, adoptive mothers face a larger penalty than biological DSC mothers in year 0, likely because of the shorter paid leave available to them. Second, adoptive fathers do not have stronger penalties than biological fathers or social mothers. Again, fathers follow a remarkably similar earnings trajectory whether their partners gave birth or not.

These results lead us to reject the hypothesis of childbearing as the main explanation for divergent earnings trajectories of mothers and fathers (H2). The fact that social mothers experience a child penalty and fathers in biological DSC do not, even though both are partnered with birth mothers, further shows that efficient specialization based on childbearing cannot account for the diverging trajectories of new mothers and fathers. Note that the difference in child penalty between birth and social mothers does suggest that childbearing is relevant for within-couple inequality and it can be interpreted as a result of identity formation processes (Evertsson, Moberg, and Van der Vleuten 2022). What our results show, on the other hand, is that childbearing is not a key driver of – and, as indicated by the similarity between adoptive



and biological DSC, not even a necessary condition for — increasing within-couple inequality following parenthood.

Finally, not only the key prediction of hypothesis 3 is confirmed, but all results shown in Figures 2 and 3 point to gender being the overwhelming source of within-couple inequality following parenthood. Birth mothers in lesbian couples have a weaker penalty than mothers in biological DSC, even though the two groups are very similar in pre-parenthood characteristics and have the same leave rights. Adoptive mothers have the same penalty as biological mothers in DSC, even though the former did not go through pregnancy and can divide leave more equally with their partners. As an organizing force of the division of labor of new parents, gender seems hardly affected by a potentially offsetting factor (the mother being the primary earner) or the absence of a potentially reinforcing one (the mother giving birth).

We present two additional ways of understanding these effects. First, Figure 4 plots the within-couple penalty, i.e. the percentage by which the earnings of (birth) mothers fall behind their partners' as a result of the transition to parenthood. For example, the results for the first matched sample show significant differences between biological DSC and FSSC in the level and trends of within-couple inequality. In year 1, the gap between social and birth mother in FSSC amounts to 11.5% of the counterfactual earnings, while the gap between the father and the mother in DSC reaches 27%. And while inequality in lesbian couples remains relatively stable at around 10%, it continuously increases for different-sex couples, reaching approximately 40% eight years after birth.

Finally, consider the following informal comparisons based on the results shown in Figures 2 and 3: five years after becoming mothers, women in biological DSC face a 33%

penalty if they were the primary earners before birth, versus a 46% penalty if they earned less than their partners. Hence, the child penalty for these mothers changes by 13 percentage points based on their relative economic standing in the couple. When comparing, again at five years after parenthood, the matched biological and adoptive mothers in DSC, the difference in penalty is virtually zero (39% for both groups). But there is a 17 p.p. difference between the penalties faced by matched lesbian birth mothers and biological mothers in DSC (19% and 36%, respectively, at event time 5), even though they are very similar in pre-birth characteristics. This shows that the gender of the partner is more consequential for women's earnings trajectories than pregnancy or their relative economic standing in the couple before parenthood.

## **5. Summary and discussion**

This article investigated the child penalty in three groups of couples who became parents in the Netherlands between 2005 and 2012: different-sex and female same-sex couples who had a biological child, and different-sex couples who adopted a child. We eAlthough it is well-established that labor market outcomes for men and women in heterosexual couples diverge after (biological) parenthood, our study is among the first to analyze other types of couples in the same methodological framework. Comparing these groups allowed us to evaluate how the earnings trajectories of new parents map into three major sources of within-couple differentiation, namely relative earnings pre-parenthood, childbearing and gender. Each of these factors has been given causal primacy by different explanations of the unequal division of labor among new parents, but disentangling their effects has been nearly impossible in previous research.

Contrary to what the hypothesis of earnings-based specialization predicts, (birth) mothers who are the primary earners in the couple still face stronger child penalties than their partners. This is in line with previous research showing that (heterosexual) couples fail to efficiently specialize when the mother has higher earnings potential (Grunow 2021). Childbearing is also not the main driver of inequality for new parents. Both an economic perspective — which sees childbearing as a source of comparative advantages for women — and a socio-psychological perspective — which casts pregnancy and breastfeeding as bases for distinct motherhood and fatherhood identities — predict that birth mothers would have stronger penalties than adoptive mothers in different-sex couples and partners of birth mothers would have weaker penalties than adoptive fathers. What we find, instead, is that mothers in different-sex couples have similar penalties regardless of childbearing, while fathers have similar premiums whether their partners gave birth or not. Our results offer strong support for the doing gender hypothesis. This is reflected both in the similarity between biological and adopting different-sex couples and in the lower within-couple inequality in female same-sex couples.

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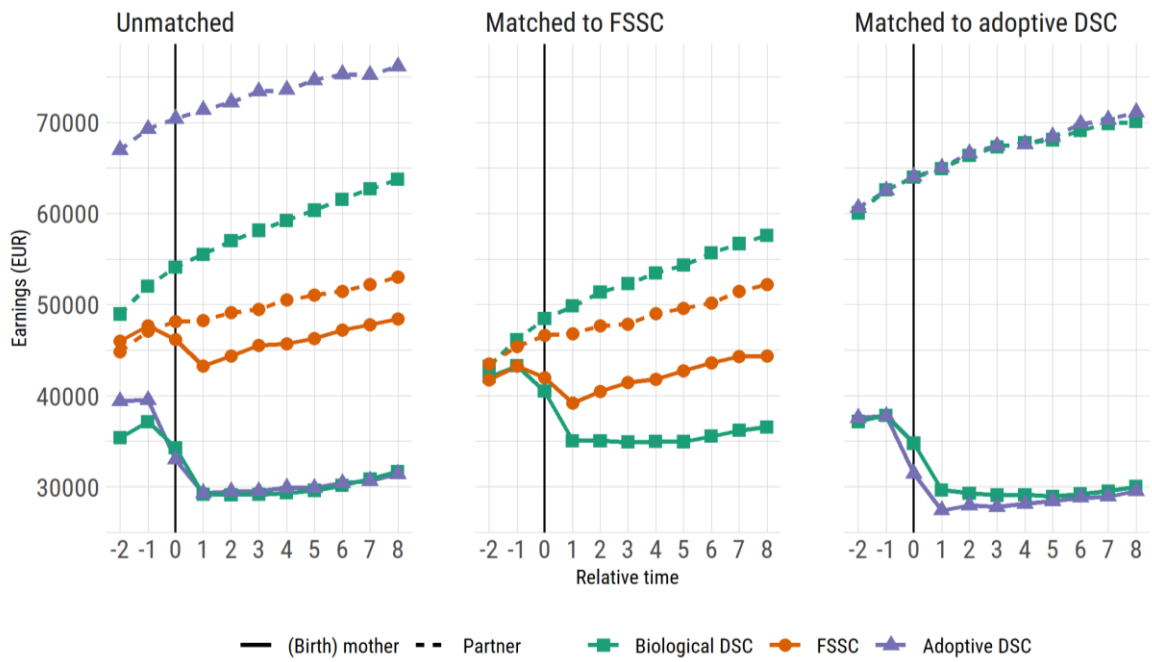
**Table 1 – Descriptive statistics**

	Unmatched			Matched 1		Matched 2	
	DSC biological	FSSC	DSC adopting	DSC biological	FSSC	DSC biological	DSC adopting
<i>(Birth) mother</i>							
Age at birth/adoption	29.72	33.86	36.63	33.08	33.20	35.47	35.58
Income before birth/adoption (EUR) <sup>a</sup>	37114.50	47958.73	40451.34	43518.95	43645.94	38730.12	38512.22
Self-employed (%)	3.80	7.24	7.91	2.04	2.06	2.56	2.57
Education (%)							
Up to lower secondary	7.33	4.06	4.25	6.06	4.38	6.35	4.48
Upper secondary	29.73	21.65	20.77	24.32	23.32	24.13	21.21
Tertiary	43.63	59.88	43.37	48.90	58.18	42.77	43.02
Missing	19.31	14.41	31.60	20.72	14.12	26.74	31.29
<i>Partner</i>							
Age at birth/adoption	32.26	33.84	38.06	33.28	33.25	37.26	37.30
Income before birth/adoption (EUR) <sup>a</sup>	51249.86	47197.23	68811.94	45744.43	45609.13	61982.32	62139.02
Self-employed (%)	9.94	5.79	10.63	3.24	3.22	5.43	5.40
Education (%)							
Up to lower secondary	7.73	4.06	3.61	7.66	4.38	4.47	3.75
Upper secondary	26.79	22.88	16.77	28.27	23.95	19.01	17.85
Tertiary	38.84	55.39	46.98	40.73	54.87	44.81	44.40
Missing	26.64	17.67	32.64	23.34	16.80	31.70	33.99
(Birth) mother is primary earner (%)	26.47	51.53	18.98	47.46	48.21	16.84	17.15
N	456,572	1,381	2,022	39,654	1,119	37,590	1,518

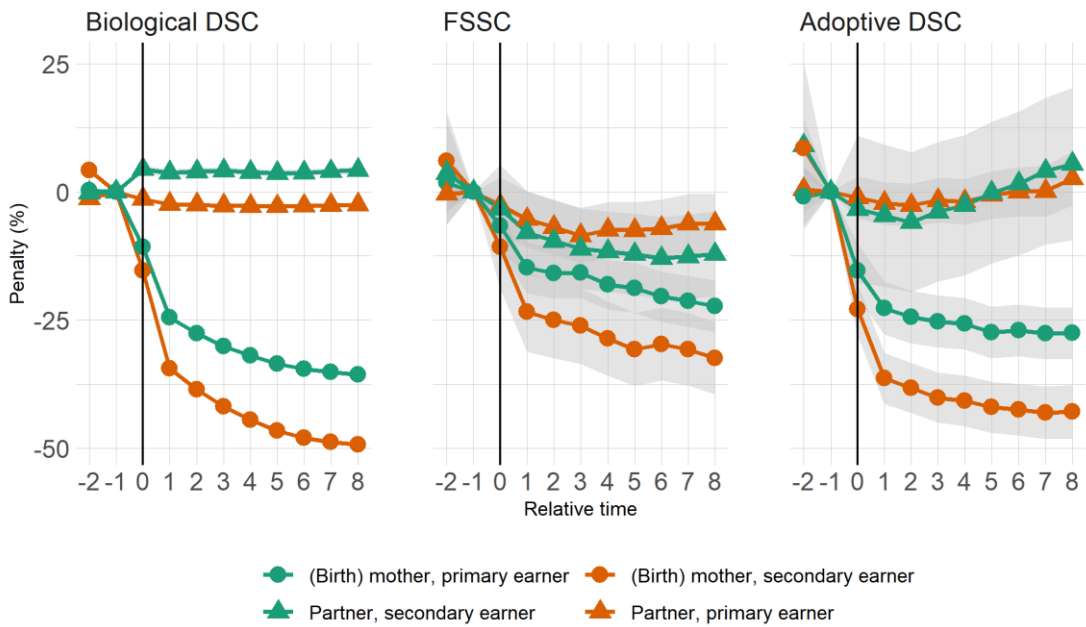
<sup>a</sup> Average annual gross income in the two years before the arrival of the child (adjusted to 2015 euros).

Note: Couples were matched by coarsened exact matching (CEM) using age, income and self-employment for both partners. See text for details.

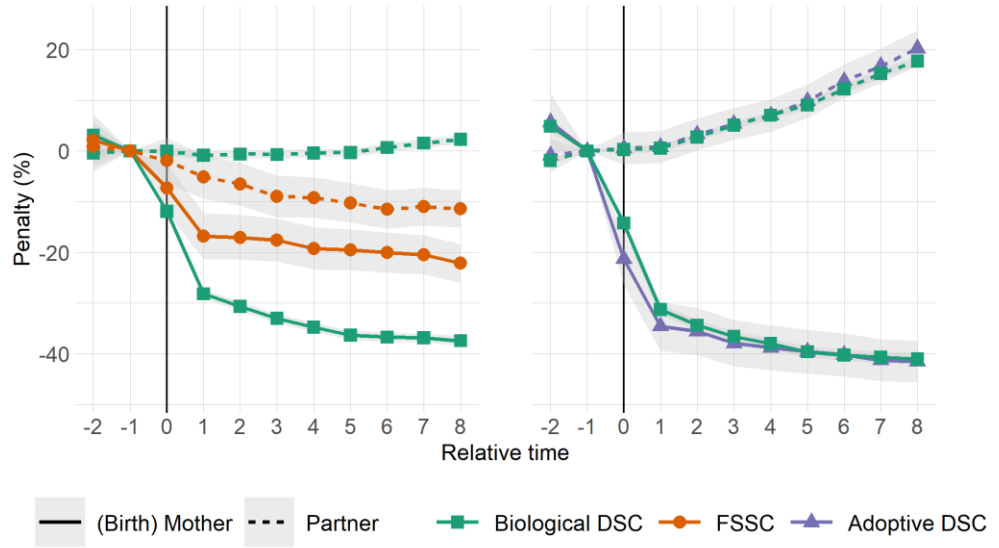
**Figure 1 – Earnings trajectories following parenthood**



**Figure 2 – Child penalty for primary and secondary earners, unmatched sample**



**Figure 3 – Child penalty for (birth) mothers and their partners, matched samples**



**Figure 4 – Within-couple child penalty, matched samples**

