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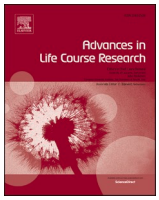

Is employment during motherhood a 'value changing experience'?

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ABSTRACT

We study whether the experience of 'employment during motherhood' (EDM) exerts an effect on attitudes towards the welfare effects of EDM, which proxy gender norms with regards to employment. We examine unique evidence from a large, representative, and longitudinal data set that collects attitudinal data over about a decade in the United Kingdom. We draw on an instrumental variable (IV) strategy that exploits variation in local labour markets using a Bartik instrument for employment to address the potential endogeneity of EDM experience in explaining attitudes. We find that both childless women who work and mothers who do not work are more likely to agree with the statement that 'pre-school children suffer if their mothers work', which we interpret as more traditional gender values. However, this is not the case for women who work and have children. These findings suggest that motherhood confirms individuals' priors, and suggest that EDM is a *value preserving* rather than a *value changing* experience. These results suggest that the so-called 'motherhood penalty' in employment trajectories cannot be fully explained by a change in attitudes after giving birth.

1. Introduction

Traditional economic explanations of human behaviour assume that people's attitudes and values precede their behaviour. This is particularly the case for recurring behaviours like those related to employment.[1] However, some literature documents that certain behaviours are inferred from the experiences (Kahan, 2010) rather than resulting from peoples attitudes (Akerlof & Dickens, 1982). However, to date is unclear what life experiences follow from people values (hence, 'confirm individual priors'), or change such values, and become 'value changing experiences'- (Akerlof, 1983; Benabou & Tirole, 2011; Brennan et al., 2013).[2] The purpose of this study is to examine whether women's attitudes towards employment during motherhood ('whether a pre-school child suffers if her/his mother works') change after the actual experience of employment during motherhood (EDM).

Understanding the effects of EDM on attitudes is a critical step towards identifying the drivers of the motherhood wage penalty, which is estimated to be around 7% of a female wage per each child (Budig & England, 2001; Burda et al., 2007; Sigle-Rushton & Waldfogel, 2007). Such a motherhood penalty explains a significant portion of the overall gender pay gap and, more broadly, influences the likelihood of returning to work after having a child, as well as persisting gaps in old-age pension income and poverty odds (Schober & Scott, 2012). The effects of such motherhood penalty include job experience losses and decreased workplace productivity (Becker, 1985), as well as a shift to mother-friendly jobs, and employer discrimination after motherhood (Budig & England, 2001; Sigle-Rushton & Waldfogel, 2007).

While governments have designed interventions to correct some of these disadvantageous effects on employment (e.g., job-protected maternity leave to encourage earlier return to work and minimize the loss of job experience, or childcare provisions to minimize lower productivity at work or parental leave), such gender disadvantage continue to exist, and the literature suggests evidence that societal and individual attitudes toward gender norms can be potential explanations for lower female labour market participation (Farré & Vella, 2013; Fernandez et al., 2004; Fernández & Fogli, 2009; Fortin, 2005; Johnston et al.,

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[1] Consistently, classicial psychological theories of planned behavior (Ajzen, 1985) predict individual preferences from their attitudes.

[2] Although early life experiences (Brewster & Padavic, 2000; Giuliano & Spilimbergo, 2014; Wilkie, 1993) and intergenerational transmission (Fernández & Fogli, 2009) influence attitudes toward social norms, there is some scope for change from small-scale local community interventions (Archaya, 2004) and especially from life-experiences (Danigelis et al., 2007; Mason & Lu, 1988).

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2014), the gender pay gap (Burda et al., 2007), and an unequal division of domestic work (Cunningham, 2008; Davis & Greenstein, 2009, 1996; DeMaris & Longmore, 1996). Understanding whether a shift to mother-friendly jobs is the result of women's shift towards traditional attitudes when they become mothers, or of other forms of discrimination, is the focus of this paper.

This paper investigates whether EDM alters women's attitudes towards the welfare effects of EDM on children, a commonly used proxy of attitudes to gender norms in the literature. This is important because motherhood is an event that women can directly experience first hand and might have fresh memories of its effects for a short time period, unlike childless women in employment who do not have direct experience of EDM, or women with older children who although having experienced EDM in the past, might be affected by short term memories and suffer from recollection bias. Furthermore, our data allows us to compare the anticipation of EDM with the actual realisation of EDM. To that end, we have focused on women only (rather than men), as they are bearing the full consequences of motherhood. That is, one can compare the attitudinal change towards the effects of an event (EDM) before, during and after the experience. Finally, we have carried out a series of robustness checks that focus on men alone.

We use data from a nationally representative longitudinal survey conducted in the United Kingdom that collects information on the relevant records for about a decade, from 2005 to 2013. To address potential endogeneity concerns, we employ fixed effect specifications which control for time invarying unobservables, and we focus on attitudes after the birth of the first child (assuming the effects are an unanticipated experience). More importantly, we instrument women's employment status, using an instrumental variable strategy where we exploit variation of local labor markets using a Bartik instrument (an interaction of local industry employment shares and national employment growth rates), which allows us to address concerns about the endogeneity of employment decisions on attitudes, as it changes in local labor markets do not affect attitudes through any other channel but female employment.

Several theoretical explanations can underpin attitudinal changes after EDM. Pre-maternity expectations about children's needs and their subsequent effects on employment may not be fully anticipated. That is, parents are frequently taken back by the experience of having children (Deaton & Stone, 2014), and given that individuals seek consistency between their values and their actual behavior (Akerlof and Dickerns, 1982), they may change their beliefs in response to their new circumstances. This would result in a 'value changing experience' effect. Alternatively, experience may serve to confirm previous attitudes (prior values). That is, individuals may fall prey to confirmation bias (the tendency for people to interpret and seek information that confirms their prior values). Hence, EDM may instead confirm, and even strengthen individuals' 'pre-approved attitudes' (giving rise to belief preservation effects').[3] Against this backdrop, the primary goal of the paper is to determine whether motherhood is a 'value changing experience' or instead, a 'value confirming experience' for working women.

We find that working experience makes childless women more traditional, and the same holds for non-working women who experience motherhood. That is, childless women who work and mothers who do not work are more likely to agree that pre-school children suffer if mothers work. However, when women are actually exposed to EDM, and hence experience both motherhood and employment they do not significantly change their attitudes gender norms. This results suggest that employment during motherhood is not a 'value changing experience' but rather a 'value preserving experience'. Hence, the so-called 'motherhood penalty' cannot be fully explained by a change in attitudes after giving birth.

To our knowledge, this is the first paper to examine this question with causal inference methods and a large sample. Two previous studies – Berrington et al. (2007) and Schober and Scott (2012) - focused instead on the impact on attitudes towards entry into parenthood and the simultaneous change in economic activity. Consistently with our results, both studies document that becoming a mother is not associated with a change in gender role attitudes unless employment patterns change after childbirth, in which case mothers (and fathers) adjust their attitudes beforehand. Our paper improves on their analyses by alleviating endogeneity concerns, and drawing on a more specific attitudes where both the experience and the attitudes with regards to the experience are aligned.

The paper is organized as follows. The next section provides the background and a short literature review. Section three describes the data and empirical strategy. Section four displays the results, sections five and six present the heterogeneity effects and robustness checks and we provide a conclusion in section seven.

2. Related literature and hypotheses

2.1. Malleability of attitudes

The dynamics of attitudes towards social norms, can be influenced by life course events such as maternity, and to date, two main theories have emerged to explain its evolution. Cohort replacement theories contend that attitudes evolve with cohort changes, whereas intra-cohort change theories draw on the effect of key life experiences that change people's social status such as marriage, parenthood, and employment patterns, among others, which can have an influence on attitudes.

Nonetheless, whether in the form of cohort or experience effects, processes of value change compare to a 'silent revolution' (Inglehart, 1971) influencing individuals' perception of their own 'selves' (Giddens, 1991). Karl Mannheim (1952) was one of the first to argue that each generation receives a particular imprint of the social and political events taking place during its youth, thus exerting a decisive influence on later attitudes and actions. Similarly, Schuman and Scott (1989) used the concept of 'collective memories' imprinted during adolescence and early adulthood, to argue that these memories persist throughout one's adult life and shape individual behaviour. Our focus in this paper is on life experiences.

Life experience approaches include the effects of early life experiences (Glenn, 2003; Inglehart & Baker, 2000) and the impressionable years hypothesis (Carlsson & Karlsson, 1970; Krosnick & Alwin, 1989; Ryder, 1965). Both emphasise the importance of adolescence and early adulthood in shaping attitudes that later on remain rather stable[4].

An alternative approach contends that people are highly adaptable throughout their lives through experience (Brim & Kagan, 1980). Accordingly, 'affective experience' can influence colour preferences (Strauss et al., 2013), and laboratory experiments show that experience with risk can change risk preferences (Ert & Haruvy, 2017). Similarly,

[3] The concept of 'attitudes' is understood widely as any 'evaluation of objects, behaviour, events or people which can be expressed by statements such as 'I agree with/disagree with' (Bicchieri, 2017; Schwartz, 2012). More specifically, gender norms are understood as 'collective definitions of socially approved conduct concerning groups constituted in the gender order – mainly distinctions between men and women' (Pearse & Connell, 2015). Therefore, attitudes towards gender norms are individual evaluations of these norms.

[4] One other relevant source of attitude formation at younger age is the influence of parental attitudes (Min et al., 2012; Platt and Polavieja, 2016). Besides early life experiences, the political and social context can influence attitudes in the long run. Studies that draw on evidence from the German reunification as a natural experiment document that gender ideology, particularly views on maternal employment, differ between East and West (Zoch, 2021). That is, East German cohorts socialized after reunification hold less egalitarian ideologies than cohorts socialized during the German Democratic Republic (Ebner et al., 2020).

experience with democracy increases support for democracy (Fuchs--Schündeln & Schündeln, 2015)[5].

Throughout adulthood, individuals engage in workplace or household experience, which helps forming expectations that validate some attitudes while discouraging others' (Brooks & Bolzendahl, 2004). Life events such as parenthood, childbirth, employment, and marriage, among others, may influence attitudes towards employment, motherhood, and gender attitudes in general (Baxter et al., 2015). These changes in circumstances during adulthood can significantly mediate other early influences, resulting in wider 'life-course changes'. However, the academic debate is far from settled. Several studies document strong evidence of attitude stability within cohorts (e.g. Brewster & Padavic, 2000; Wilkie, 1993), whilst Mason and Lu (1988) and Danigelis et al. (2007) find evidence of intra-cohort change, and Krosnick (1988) documents that attitudes that are more central to individuals are more resistant to change.[6] This paper contributes to this literature by examining whether gender attitudes change after EDM.

2.2. Gender norms after experiencing employment and childbirth

Although research on attitudes towards *towards gender norms* has increased substantially, so far the evidence is still at an early stage. Some theories follow the cohort replacement argument and point at the relevance of adolescence and early adulthood stages of an individuals life. Gender attitudes formed around those stages of life remain rather stable. Consistently, research in psychology shows that by the age of six, children are already aware of their gender stereotypes (Bian et al., 2017) with social pressure conforming to existing gender norms mounting around the early adolescence period (Lane et al., 2017). Adolescence and early adulthood are known to psychologists as 'a dynamic period of development – a time when (…) gender norms are shaped' (Lane et al., 2017). Women experience gender salient events earlier than men, and although they experience a later exposure to workplace discrimination or work-life balance difficulties, their attitudes may remain unchanged because they have already reached a 'threshold of exposure' in their earlier stages of life (Shafer & Malhotra, 2011).

So far, there is a substantial body of research demonstrating evidence of adaptability of the adaptability gender norms through the life course. An explanation includes the presence of cognitive dissonance between attitudes and behaviours (Festinger, 1957), suggesting that to reduce such cognitive dissonance, individuals can modify their attitudes to align with their newly acquired behaviour(Cunningham, 2008, Berrington et al., 2007; Bolzendahl & Myers, 2004; Fishbein & Ajzen, 1975). However, another mechanism refers to changes in self-identity (see Baxter et al., 2015 and Cunningham, 2008), with parenthood or employment playing an important role. This new role's importance may also be due to the 'persuasive communication' mechanism identified by Fishbein and Ajzen (1975), in which a newly acquired social network as a result of either parenthood or new job environment influences attitudes toward gender norms (Berrington et al., 2007; Cunningham, 2008).

The literature on the impact of employment on attitudes towards gender norms is quite conclusive. Both cross-sectional studies (see for example Glass, 1992; Huber & Spitze, 1983; Mason & Lu, 1988) (see for example Mason and Lu, 1988; Glass, 1992; Huber and Spitze 1981) and studies using longitudinal data are quite consistent in finding that women who participate in the labor market exhibit more liberal attitudes towards gender norms, though most evidence is from the United States (see for example M. Cunningham, 2008; Cunningham et al., 2005; Thornton et al., 1983; Thornton & Freedman, 1979; Coverdill et al., 1996; Fan & Marini, 2000).

Conversely, the evidence on the effect of parenthood on attitudes towards gender norms is less conclusive. Studies focusing on work commitment, defined as 'the centrality of the work role as a source of intrinsic satisfaction relative to other adult roles' (Bielby & Bielby, 1984), report mixed evidence.[7] Studies focusing specifically on gender-related attitudes have documented evidence of a relationship between the birth of a child and more traditional attitudes towards gender norms[8], but two studies using non-nationally representative data from the US find either little evidence of childbearing influencing attitudes (Cunnigham et al., 2005; Morgan & Waite, 1987).

Research studying EDM effects, namemly the *joint* impact of employment and childbirth, like ours is still scarce. Berrington et al. (2007) use the longitudinal data (British Household Panel Study, or BHPS) from 700 individuals up until 1997, a graphical chain model and SEM approach to document that it is not entry into parenthood as such, but the change in economic activity that is related to attitudinal change. Schober and Scott (2012) use BHPS data up until 2007 following 300 individuals to show that becoming a mother is not associated with a change in gender role attitudes if individuals do not change employment. If work patterns change after childbirth, both mothers and fathers adjust their attitudes. We contribute to this literature in several ways. First, we use an instrumental variable approach to account for the endogeneity of employment, and we estimate the effects using a panel fixed-effect model that considers time invariant unobservables. Finally, we focus on the first child only to make sure the effects are not anticipated from the memory of a previous child. This is important given the potential reverse causality between childbirth and attitudes and employment. Second, we draw on evidence from a larger sample than previous studies, and more specifically we follow of 5000 women. Finally, we follow individuals for almost a decade, from 2005 to 2013.

2.3. Hypotheses

The theoretical framework and existing evidence above lead to the following hypotheses:

H1: Women who start working exhibit more liberal attitudes toward gender norms (controlling for self-selection into work) *than women who do not work*. Indeed, women who begin working may experience cognitive dissonance if their attitudes are more traditional. As a result, they may be able to resolve the inconsistency by changing their attitudes (Bolzendahl and Myers, 2004). This may depend on whether they transition from training to their first job, or from university to their first job, as in the latter case, their workplace experiences may be more traditional than their tertiary education environment, which suggests the need to consider controlling for education attainment. At the same time, women who work may begin to value this experience while also realizing they

[5] Similarly, welfare state reforms improving the experience of maternity can act as catalysts for behavioural change (see Zoch and Schober, 2018 for German childcare policies, Kotsadam and Finseraas, 2011 for Norwegian daddy quota, and Ellingsaeter, Kitterod and Lyngstad 2016 for Norwegian childcare-related reforms).

[6] Brooks and Bolzendahl (2004) document strong evidence consistent with cohort replacement theories, and the role of learning during adulthood, though Fan and Marini (2000) document that both men and women experience an attitudinal change in an egalitarian direction as they become older.

[7] Cross-sectional studies do not find evidence of the impact of parenthood on attitudes (Doorewaard et al., 2004; Hult & Svallfors, 2002; Svallfors et al., 2001). Bielby and Bielby (1984), using longitudinal data of college graduates from the US also show no evidence for a relationship. A nationally-representative study from the US (Noonan et al., 2006) finds no evidence of an impact of parenthood on attitudes, whereas two studies with nationally-representative data from Sweden suggest that entry into motherhood leads to lower work commitment, albeit only temporarily (Evertsson, 2013).

[8] Three studies from the US using representative longitudinal data find evidence that the birth of a child shifts attitudes towards more traditional stances (Corrigall & Konrad, 2007; Fan & Marini, 2000; Moors, 2003). A similar result is reached by a longitudinal study from Australia in which only the first child is taken into account (Baxter et al., 2015).

can benefit from more egalitarian gender roles at home.

Additionally, working outside the home can raise their awareness of gender inequality, dispelling myths about women's abilities to work, and introducing them to a new social network of coworkers with different attitudes. Hence, we anticipate that attitudes of women who begin working will shift toward more liberal views (Cunningham, 2008; Bolzendahl and Myers, 2004; Berrington et al., 2008; Schober and Scott, 2012). In order to understand more carefully the effect of working (alone), we focus on the effect of entering the labour market before women have children.

H2: Women who become mothers become more traditional in their attitudes towards gender norms. The rationale is similar to the first hypothesis. New mothers may experience a change in their identity and self-concept (see Baxter et al., 2015), insofar as they construct new identities for themselves, in which motherhood takes a central role. However, such central role could also be the result of the 'persuasive communication' mechanism (Fishbein and Ajzen, 1975), by which the newly acquired social network after parenthood impact their attitudes towards gender norms (Berrington et al., 2007), turning women more traditional. Alternatively, new mothers with previous less traditional attitudes may experience cognitive dissonance, especially if they experience difficulties with their life-work balance, which could be addressed by changing their attitudes towards gender norms to more traditional ones.

H2.a: mothers who are on employment do not change their attitudes towards gender roles. The paper is interested specifically in this subset of women who are mothers, and more specifically on whether, and how fast they return to their employment after having children. This is because the effect is driven by their eventual exit rather than first entry into the labour market. However, theoretically, the effect is ambiguous, since we are dealing with two life-experiences each of which exerts an impact in opposite directions. Empirically, previous evidence (Berrington et al., 2008 and Schober and Scott, 2012) suggest that entry into parenthood does not necessarily lead to attitudinal change. However, we will examine whether the effect holds even after controlling for education attainment and unemployment, and after performing a number of robustness checks.

3. Data and empirical strategy

3.1. Data

Our sample is from both the British Household Panel Survey – BHPS (University of Essex, Institute for Social and Economic Research, 2018) and the Understanding Society – Survey UKHLS (University of Essex, Institute for Social and Economic Research, NatCen Social Research, Kantar Public, 2019) datasets. Both are annual surveys consisting of a representative sample of households in which every adult member of the sampled household is interviewed, following them over a period of years. The two datasets together collect information on health, work, education, income, family, and social life, collecting both objective and subjective indicators. We use the last two BHPS waves, 2005 and 2007. These waves include interviews with around 10,000 individuals, and are UK-wide. The Understanding Society study began in 2009, and we use the first four waves, from 2009 to 2013.

The datasets used include variables measuring attitudes towards working mothers, which are the main focus of the paper. These attitudes are collected every other year. We limit our study to attitudes of female respondents over 6 waves, leaving us with a sample of around 40,000 observations. Table 1 summarises the descriptive statistics for our main dependent variable, which is the answer to the statement 'Pre-school child suffers if the mother works' capturing EDM attitudes. The descriptive evidence suggests that one out of four women in the UK agrees with this statement and that another third 'neither agrees nor disagrees'. Hence, overall female respondents in the UK seem to uphold values that can potentially limit their labour market participation after maternity.[9] Our attitudinal variable is one of the most common measures of traditional gender attitudes in the literature (Borrell-Porta, Costa-Font and Philipp, 2019). Alternative strategies such as the use of composite measures make it harder to clearly interpret the effect, and generally speaking would not be adequate as we are interested in attitudes with regards to the welfare effects of an event, namely EDM, before and after the actual EDM.

Table 1
Descriptive statistics for attitude variables for the British Household Panel and Understanding Society sample.

Variable	N	Percentage
Pre-school child suffers if mother works		
strongly agree	2584	7.01
agree	7303	19.81
not agree/disagree	12,448	33.76
disagree	10,781	29.24
strongly disagree	3752	10.18
Total	**36,868**	100

Table 2 displays the descriptive statistics for our main independent variables, that is, working status and presence of pre-school children at home, hence capturing EDM, and the individual-level control variables. The latter include age and age squared, education levels, presence of other children at home and marital status. About half (51%) of women are employed in the labour market, which includes self-employment and full and part time employment; the unemployed include women who are in full time education, retired, unemployed, or doing some form of unpaid work.[10] Two thirds (64%) do not have children in the household, almost one quarter have children (22%) and 13% have children under 4 years of age. About 20% hold no education at all, 59% are married and the average age of our female respondents is 46.3 years.[11]

Table 2
Descriptive statistics for individual working status, presence of pre-school children at home and individual-level control variables for the British Household Panel and Understanding Society sample.

Variable	Mean	Std. Dev.	Min	Max	N
Working	0.514	0.5	0	1	43358
No presence of children	0.644	0.479	0	1	43183
Presence of 0–4 year-old at home	0.129	0.335	0	1	43183
Presence of older children at home	0.223	. 419	0	1	43183
No education	0.196	0.397	0	1	42422
Education at GCSE level	0.238	0.426	0	1	42422
Education at A-levels	0.185	0.388	0	1	42422
Education between A-levels and degree	0.088	0.284	0	1	42422
Education at degree level	0.192	0.394	0	1	42422
Education at high degree level	0.101	0.301	0	1	42422
Presence of other children at home	0.237	0.425	0	1	43465
Married	0.59	0.492	0	1	43616
Age	46.34	18.53	15	104	43682

Note: All variables except for age are dummies constructed upon affirmative replies.

[9] Table A.1 presents statistics on changes of attitudes across waves. More than half of the women respondents change their attitudes across waves.

[10] Table A.2 reports statistics of transitions into and out of the labour market across waves.

[11] The equivalent of Table 2 for men can be found in Table A.11 in the appendix, and reveals a comparable distribution.

3.2. Empirical strategy

We are interested in understanding whether the EDM has an impact on the belief that pre-school children suffer if mother works (see Table A.13 in the appendix for the variable distribution). We hypothesize that the impact of employment may differ with the presence of small children at home, therefore we interact working experience dummy variable with a dummy variable measuring the presence of pre-school and older children. We attempt to explain attitudes towards gender norms (the outcome variable) described in Table 1 for individual i in period t, y_{it}, using the following specification:

$$y_{it} = \alpha + \beta_1 w_{it} + \beta_2 ch_{it} + \beta_3 w^* ch_{it} + \beta_4 X_{it} + \beta_5 R_s + u_{it} \quad (1)$$

where w_{it} is a dummy representing the working status of individual i at time t, ch_{it} is a dummy for presence of children at home taking the value of 0 if there are no children at home and the value 1 if there are children 0–4 year old at home, and 2 if children are older than 4 years old.[12] X_{it} refer to individual controls mentioned above, R_s are dummies for each of the s regions added to control for institutional factors and u_{it} are the residuals. Our coefficients of interest are β_1, β_2 and β_3, and measure the effect of each covariate in terms of likert scale unit change in the dependent variable.

Eq. (1) may suffer from several endogeneity problems. First, attitudes might be influencing employment decisions, therefore causing a potential problem of reverse causality. Similarly, there might be omitted variables or confounders biasing our estimates. These two problems suggest that the errors in (1) are not independent of the explanatory variables. One strategy for dealing with the omitted variable problem is to control of a wide range of individual characteristics in order to try to account for time-variant characteristics that affect our dependent variable. Taking advantage of the longitudinal nature of the dataset, we can also include individual and area fixed effects to control for time-invariant effects. Area-level fixed effects would for instance account for institutional characteristics –quality, affordability and availability of nurseries – which differ depending to the local area and may be correlated with our dependent and independent variables.

The use of fixed effects strategy alleviates the problem of omitted variable bias for time-invariant unobservables, but it does not alleviate the problem for time-variant unobservables, nor the potential reverse causality. To tackle this problem, we instrument maternal working status – e.g., we assume there is an instrumental variable z_{it} independent of u_{it} but correlated with w_{it}. The first-stage of this instrumental variable approach will then be:

$$w_{it} = \pi_1 z_{LSOA,t} + \pi_2 X_{it} + \rho_{it} \equiv \widehat{w}_{it} + \rho_{it} \quad (2)$$

The variable used as an instrument is a 'Bartik' style variable capturing local labour markets (Bartik, 1991, Goldsmith-Pinkhame et al., 2000). That is, the instrument is the local employment growth rate predicted by the interaction of local industry employment shares and national industry employment growth rates, which are to exogenously influence labour supply, and specifically female employment. The idea behind the instrument is that at some point in time people are distributed across geographical areas and industries in a random way. The subsequent area-level growth in the demand for jobs follows the national level growth rate according to this initial composition. Hence, the variation in demand for jobs therefore comes from national level changes. Accordingly, the instrument is defined as follows:

$$C_{at} = \sum_i G_{it} \frac{E_{ia0}}{E_{a0}} \quad (3)$$

Where G_{it} is the growth rate of industry i in year t and $\frac{E_{ia0}}{E_{a0}}$ is the initial share of employment of industry i in the area. This instrumental variables strategy has been widely used and its identification relies on the fact that small area labour market conditions influence individuals probability of employment. The identification of the effect does not rely on individual specific variation but on national level variation, and its valid so long as there are no spatial spillovers and the data consist of a series of steady states (Goldsmith-Pinkhame et al., 2000). Given that some industries (e.g., services) are more 'female friendly' than others, it is reasonable to expect that changes in the composition of in such industries will influence female employment, and influence gender norm atittudes via female employment only.

One potential concern is the strong segregation tendencies in the UK, since work-oriented mothers may be more likely to self-select into specific industries. Similarly, national-level changes may be affected by policies or the different availability of child care. The instrumental variable (IV) approach is a method that specifically deals with selection on unobservables such as those resulting from changes in the availability of child care or from anticipation of future effects of certain industries on work life balance. The idea, is that the local area variation resulting from a a strong instrument would allow retriving estimates of the effect of EDM on attitudes, net of the infuence of biased confounders. Below we discuss the strength of the instrument which in some specification clearly exceed the common thresholds (F-tests) for weak instruments (see the results section).[13]

In terms of the likelihood of having a child, one could argue that fertility is potentially endogenous, but this is especially true for subsequent children rather than the first child. Indeed, attitudes towards EDM may affect the number of children a woman wants to have. More generally, if attitudes are malleable, they are more likely to change after the first child than after the subsequent ones, as the experience is not as new. Including observations on second, third and subsequent children might therefore lead to an underestimation of the effect of having children on attitudes towards working mothers. In order to alleviate these problems, our sample in some of our specifications refers to the first child only. Hence, the subsample employed in the study is constructured by keeping only household waves with one child only, which allows the data to retain its panel structure.[14]

4. Results

4.1. Linear probability estimates

Table A3 in the appendix reports the main results using ordinary least squares (OLS), although they are potentially biased. Column (1) displays the association between working and having children at home, including individual and regional controls which refer to wider regions and capture location or special fixed effects. Estimates suggest that female employment (working) decreases the probability that women agree with the statement that a *pre-school child suffers if mother works* (from this point on, we will interpret a decrease in agreement with the statement as women becoming 'less traditional', and an increase in

[12] For observations reporting no children across the panel, it is not possible to disentangle whether they have had children in the past and have left home, or whether they have never had children. This is because all questions ask about the presence of children *at home*. Nevertheless, with fixed effects these observations leave the sample. This means that the OLS specification may result in biased estimates if women who have had children in the past but have left the panel and therefore are not registered are categorised as having had no children.

[13] To interpret the effects of the interactions we employ the *lincom* command in Stata to compute the standard lineal combination of different estimates, including point estimates and standard errors

[14] Finally, given the distribution of the dependant variable in Table A.9, we have similar estimates of the marginal effect in a probit model to be reported upon request, yet any linear probabilities with interactions are more straightforward to interpret.

agreement with the statement as women becoming 'more traditional'). Questions in the form of statements about the proper role of women in the workplace versus the home are overly regarded as proxies for gender norms in the literature[15].

Figure A.1 displays the trends in the average rating score of our central attitudinal statement measuring traditional values (namely, the percentage agreeing with the assertion that "Pre-school child suffers if the mother works") for both mothers and non-mothers,[16] where a higher value refers to disagreement with such assertion and hence measures non-traditional values. The trends suggest evidence of a reduction in non-traditional values after 2006 among mothers and a weaker increase in non-traditional values among non-mothers.

Our linear probability or ordinary least squares (OLS) estimates indicate that employment makes women less traditional by 0.35 Likert scale units.[17] The first OLS specification in Table A.3 suggests that having children at home is associated with women becoming less traditional by 0.06 to 0.11 Likert scale units. However, this result changes in the second specification, where we measure the effect of EDM, that is the effect of motherhood on attitudes among both working and non-working women. Indeed, column (2) adds an interaction effect between working and the presence of children, and our estimates reveal that though working continues to be associated with women becoming less traditional, motherhood (always proxied by the presence of children at home) makes women less traditional only when they work. That is, motherhood is associated with women turning more traditional by 0.30 Likert scale units when mothers do not work. In contrast, motherhood is associated with women becoming less traditional by 0.31 scale units if they work. Yet, given the measurement of the dependent variable – on a scale from 1 to 5, the effect of motherhood when working is not jointly significant. Finally, column (3) considers mothers experiencing the first child only to account for potential endogenous fertility, influencing fertility stopping rules. Specifications with the first child only are constructed by keeping only one observation (that of the first child) per woman and summarising information from different survey waves. Column (3) displays fixed effects estimates that are similar to those in column (2).

4.2. Instrumental variable effects

OLS estimates only take the endogeneity of fertility stopping rules into account alongside the effect of time invariants unobservables. However, these results are potentially biased in the presence of omitted variable bias and reverse causality. To alleviate these problems, Table 3 displays the effect of motherhood on working and non-working women using individual fixed effects and instrumenting female employment using a Bartik instrument[18] which reveal an F-test above the expected cut-off for weak instruments (Table A.14 in the appendix report the full specification containing first stage estimates). Column (1) shows the IV results using the same specification as in the OLS results in the Appendix, and Column (2) follows the same logic, but this time with a reduced sample that only includes the effects of first child motherhood. Both columns display similar results, and therefore we focus on Column (2).

Table 3
Impact of working on attitudes towards working mothers with pre-school children.

	(1)	(2)
Variables	IV	IV- FC
Work status	-2.439 * **	-2.155 * **
[base: not employed]	(0.835)	(0.794)
Presence of child *x* employed		
Pre-school children	0.250	1.818
	(4.974)	(1.807)
Older children	2.066 * *	1.373
	(0.892)	(1.312)
Presence of child		
[base: no children]		
Pre-school children	-0.479	-1.563
	(3.539)	(1.360)
Older children	-1.572 * *	-1.211
	(0.726)	(1.015)
Linear combination of estimates: effect for working mothers		
Pre-school children	-0.288	0.255
	(1.446)	(0.477)
Older children	0.494	0.162
	(0.475)	(0.386)
Observations	27,993	20,982
R-squared	-0.625	-0.484
Number of pid	11,605	8942
Region dummies	Yes	Yes
Summary results for first-stage regressions		
F Test (Work Status)	24.34 * **	15.23 * **
Chi-sq (Work Status)	55.67 * **	20.18 * **
Anderson-Rubin Wald test (Joint significance of endogenous regressors)	5.53 * **	4.68 * **

Individual-clustered and robust standard errors in parenthesis: * ** $p < 0.01$, * * $p < 0.05$, * $p < 0.1$
Note: All models include controls for age, education, marital status, presence of other children at home and regional dummies. Specifications: (1) Instrumental variable strategy specification with individual fixed effects. (2) Instrumental variable strategy specification with individual fixed effects for the subsample with first child only.

Our estimates suggest that women who experience either the effects of working or having children (but not both at the same time), are more traditional. That is, *women with no children at home, that change their working status and start working, become more traditional*. Similarly, women who do not work and become mothers also become more traditional, albeit our estimates are less precise. Conversely, *women who go through both experiences, that is, who become mothers while working, do not change their attitudes significantly*. This estimate is displayed by the linear combination of the estimates for working women: women who have a pre-school child become 0.25 Liker scale units less traditional, albeit the estimate is not precisely estimated. Furthermore, the significance of the coefficient does not change when those children grow older. This result is in line with the earlier literature examining the joint impact of employment and motherhood on attitudes towards gender norms. Indeed, such literature establishes that parenthood is not associated with a change in gender attitudes when work patterns remain the same. Against the backdrop that employment exerts a positive influence (towards more liberal attitudes) on attitudes towards gender roles we find no evidence of an effect.[19]

4.3. Robustness checks

Table A.6 in the appendix shows that estimates in Table 3 are not driven by pregnant women in the sample who might anticipate the effect of EDM. Similarly, Table A.9 shows that part-time work does not drive the effect. Similarly, Table A.10 distinguishes the effect of EDM on adult

[15] This question is used in a number of surveys including the World Value Survey, International Social Survey and measure social values; they do not refer to one's own situation but to "acceptable" roles of men and women generally, and if individuals do not change their attitudes after experiencing maternity, they should not be influenced by it. See Figure A.1 in the appendix for the distribution of the variable.

[16] Namely, women who are not mothers which are included in our sample.

[17] See detailed OLS results in Table A.3 in the appendix.

[18] The Bartik instrument is specified in Section 3 of the paper and it is relevant and significant and reveals an F-test and the Anderson test above the expected cut-off. See Table 3 and Table A.14 in the appendix for the first stage regression coefficients.

[19] Table A.5 reports the estimates excluding full time students and retired women and Table A.7 focuses on younger women only.

children and pre-school children as in Borrell-Porta et al. (2019). All estimates are consistent with those displayed in Table 3.

5. Heterogeneity effects

Given that such baseline results in Table 3, Tables 4 and 5 report evidence of heterogeneous reactions to EDM on attitudes. More specifically, it could be that mothers engage in part-time work because they have similar concerns for their children to non-working mothers. If that is indeed the case, the effect would be concealed within the variable working, which is a binary variable. However, Table A.9 suggests no evidence of such part time effects. Table 4 shows the results employing a binary employment variable with a cut-off at 8 hours and 16 hours. Columns (1) and (3) distinguish women who work more than 16 hours (hrs) from those who work less than 16 hours, and column (2) and (4) distinguish women who work more than 8 hours from those who work less than 8 hours. That said, our estimates are not different from those presented in the previous tables, and the standard errors are even larger (less precise).

A different but equally important type of heterogeneity might result from women education attainment in the sample. Education tends to affect attitudes, with highly-educated women revealing generally more liberal attitudes. Hence, in Table 5 we test whether the effect of EDM changes depending on the mother's education level. These results however show no significant differences with previous results, and more importantly, they are imprecisely estimated (standard errors are large).

Table 4
Impact of hours of work on attitudes towards working mothers with pre-school children.

	(1)	(2)	(3)	(4)
Variables	+ 16 hrs	+ 8 hrs	+ 16 hrs-FC	+ 8 hrs -FC
Presence of child				
[base: no children]				
Pre-school children	-4.528 *	-3.699 *	-0.190	-2.446
	(2.746)	(1.954)	(27.965)	(2.817)
Older children	-3.421	-2.768 *	0.838	-1.961
	(2.258)	(1.496)	(24.877)	(1.891)
Hours worked + 16	-4.623 * *		-3.484	
[base: hrs< 16]	(2.265)		(2.448)	
Presence of child *x* + 16 hrs				
Pre-school children	6.460		-0.764	
	(4.015)		(46.577)	
Older children	4.111		-2.431	
	(2.896)		(38.459)	
Hours worked + 8		-3.976 * *		-3.398 * *
[base: hrs< 8]		(1.668)		(1.407)
Presence of child *x* + 8 hrs				
Pre-school children		4.800 *		3.017
		(2.550)		(3.831)
Older children		3.251 *		2.256
		(1.742)		(2.300)
Linear combination of estimates: effect for working mothers				
Pre-school children	1.932	1.101 *	-0.954	0.571
	(1.290)	(0.613)	(18.618)	(1.035)
Older children	0.690	0.483	-1.593	0.295
	(0.782)	(0.352)	(13.599)	(0.559)
Observations	28,227	28,227	21,170	21,170
R-squared	-1.684	-1.188	-1.859	-1.120
F test	8.38	11.26	3.05	4.77
Number of pid	11,694	11,694	9021	9021
Region dummies	Yes	Yes	Yes	Yes

Individual-clustered and robust standard errors in parenthesis: * ** $p < 0.01$, * * $p < 0.05$, * $p < 0.1$

Note: All models include controls for age, education, marital status, presence of other children at home and regional dummies. Specifications: (1) and (2) Instrumental variable strategy specification with individual fixed effects. (3) and (4) Instrumental variable strategy specification with individual fixed effects for the subsample with first child only.

Table 5
Impact of working on attitudes towards working mothers with pre-school children. Separating by level of education.

	Education: Below A-levels		Education: Above A-levels	
	(1)	(2)	(3)	(4)
Variables	IV	IV- First Child	IV	IV- First Child
Work status	-3.331	-2.980 * *	-2.635	-1.747
[base: not employed]	(3.813)	(1.438)	(8.015)	(1.663)
Presence of child *x* employed				
Pre-school children	-1.027	-2.209	19.636	7.068
	(51.626)	(7.565)	(73.029)	(7.872)
Older children	2.605	1.553	-5.779	-0.808
	(3.998)	(2.156)	(16.217)	(2.800)
Presence of child				
[base: no children]				
Pre-school children	0.221	1.071	-16.027	-5.976
	(31.513)	(4.800)	(59.657)	(6.717)
Older children	-1.853	-1.013	2.701	0.054
	(1.489)	(1.449)	(6.445)	(2.180)
Linear combination of estimates: effect for working mothers				
Pre-school children	-0.806	-1.138	3.609	1.092
	(20.116)	(2.788)	(13.384)	(1.171)
Older children	0.751	0.539	-3.077	-0.753
	(2.680)	(0.9211)	(10.570)	(1.149)
Observations	16,845	12,733	10,453	7649
R-squared	-1.373	-1.178	-16.215	-0.919
F Test	13.09	7.84	5.39	6.28
Number of pid	7005	5417	4656	3496
Region dummies	Yes	Yes	Yes	Yes

Note: All models include controls for age, education, marital status, presence of other children at home and regional dummies. Specifications: (1) and (3) Instrumental variable strategy specification with individual fixed effects. (2) and (4) Instrumental variable strategy specification with individual fixed effects for the subsample with first child only.

6. Robustness checks

Finally, we consider several potential robustness checks. Table A.4 in the appendix reports the estimates of our main specification after excluding divorced and separated women. This is especially relevant because after a couple's separation or divorce, it is likely that one of them leaves home, and therefore drops out of the sample. This means that some women will have dropped out and others will not, resulting in non-random attrition in our analysis. Similarly, we examine the effect of second or higher order births to account for the rising care burden after the first child. Table A.8 in the appendix include the effect of higher order birth too.

Estimates are consistent with those in Table 3, but this time they are more precisely estimated. Column (2) shows that women who experience either employment or motherhood (but not both at the same time), become more traditional. That is, we find that women without children at home, who start a job (hence changing their working status), become more traditional. Similarly, when women do not work, motherhood makes them more traditional on average. Conversely, *women who are exposed to EDM, that is, who become mothers while working, do not change their attitudes significantly*. The interaction effect reveals that their attitudes increase by 0.026 scale units though estimates are less precisely estimated (only significant at 10% significance level), resulting in a joint non-significant 0.35 unit scale increase.

The significance of the coefficient does not change either when children grow older. Finally, we measure the effect of EDM among adult men in the households as reported in Table A.12. Importantly we find no evidence suggesting that previous estimates are driven by a change in values and preferences of men in the household.

7. Conclusion

This paper has examined whether attitudes towards the welfare effects on the child of employment during motherhood (EDM) change after the actual experience of EDM. We examine evidence from a question that has been studied in the literature (see for example Borrell-Porta et al., 2019); namely if a *pre-school child suffers if mother works*, proxying traditional gender norms. Drawing on different specifications, and especially on an instrumental variable strategy that exploits variation in local labour markets, namely a Bartik instrument (an interaction of local industry employment shares and national employment growth rates) we study whether exogenous changes in female employment during motherhood alter women's attitudes towards gender norms. This is an important question to understand the behavioural roots of gender employment gaps.

Against the backdrop of EDM qualifying as what Akerlof (1983) defines as a 'value changing experience', we document evidence consistent with the idea that EDM is a 'value preserving experience'. More specifically, we find that when women start working, or when non-working women become mothers, their attitudes become more traditional (namely, are more likely to agree that a child suffers when a mother works). However, *when women jointly go through the two experiences of employment and motherhood, their attitudes do not change significantly*.

The fact that childless women who start working become more traditional in their attitudes towards gender roles can appear as unexpected. However, the context of the study – in the UK – may partially explain the results. As Schober and Scott (2012) suggest, parental policies in the UK are still family oriented and gendered. While there has been some improvements, maternity leaves are longer than paternity leaves, and formal childcare for 0–3 years-old is still not universally available. This institutional setting may explain why childless women, once they start working, might believe that a child suffers if mother works. Similarly, non-working women who become mothers might associate the scarcity of formal care and the incentives of parental leave policies with increased child suffering if the mother works. In such an institutional setting it seems that motherhood and employment are value-preserving experiences.

This result is consistent with findings of earlier studies (Berrington et al., 2008; Schober and Scott, 2012). That said, it would be interesting to understand the effect of EDM in countries where the institutional setting and family policies are more egalitarian. Compared to earlier studies, our estimates are not only retrieved from larger and more contemporary datasets, but also address important endogeneity concerns that come both from employment (which we address with a Bartik instrument), and endogenous fertility stopping rules (addressed by examining first children only).

Our findings carry significant implications for the future understanding of the behavioural roots of the motherhood wage penalty. First, they indicate that individuals' priors and early life exposure are critical to the formation of women's attitudes towards motherhood and employment. Second, they suggests that the motherhood penalty, associated with lower productivity and a change to mother-friendly jobs, cannot be explained by a change in attitudes of working women when they become mothers.

Appendix A. Supporting information

Supplementary data associated with this article can be found in the online version at doi:10.1016/j.alcr.2023.100528.

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