Journal of Social Policy (2025), page 1 of 22
doi:10.1017/S004727942500008X

ARTICLE

Differential formal childcare uptake amongst migrants and their descendants in Europe and Australia: the role of socio-economic status, employment and work–family attitudes

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(Received 3 April 2024; revised 15 December 2024; accepted 3 February 2025)

Abstract

The provision of formal childcare services holds significant potential benefits in addressing challenges posed by population ageing, labour shortages and welfare dependency. However, existing literature indicates persistent differentials in formal childcare uptake by migration background, with limited understanding of underlying demand-side factors. This study addresses this gap by comprehensively examining demographic, socio-economic, employment-related and attitudinal characteristics as potential explanations for these disparities. Utilising data from the Generations and Gender Survey across seven high-income countries, our findings reveal that whereas differentials for migrants' descendants are limited and insignificant even without controlling for background variables, the negative differential for migrants disappears almost completely. Socio-economic status and particularly employment potential emerge as a key explanatory factors alongside differential attitudes towards maternal employment, which seem to play a role in some contexts, yet not in others. Cross-country differences in the results are discussed in the face of socio-economic gradients in formal childcare uptake, migrant-native gaps in the labour market and below-demand supply of formal childcare, yet also plead for future research interacting demand- and supply-side factors for a larger set of countries. In conclusion, this study reveals the intricate interplay of demographic, socio-economic and attitudinal factors underlying migrant–native disparities in formal childcare uptake.

Keywords: formal childcare; migrant populations; demand-side; Europe; Australia

Introduction

In an era of population ageing, labour shortages and high pension costs, the availability of formal childcare is a policy offering multiple potential benefits. Formal childcare services support parental employment, thereby reducing welfare

dependency and poverty risks (Troger and Verwiebe, 2015; Pavolini and Van Lancker, 2018). Furthermore, formal childcare may stimulate household gender equality, realisation of fertility intentions and improve satisfaction with family life (Isaksen and Bikova, 2019; Schober and Schmitt, 2017). For young children, formal childcare is believed to promote cognitive development, fostering educational and economic performance (Havnes and Mogstad, 2011; Hansen and Hawkes, 2009; Felfe and Lalive, 2012; Leseman and Slot, 2014; Burger, 2010). Additionally, formal childcare may alleviate pressure on informal childcare providers, often grandparents, further supporting employment.

For such effects to materialise, formal childcare must reach children in various population sub-groups. However, previous studies document strong socio-economic differences in formal childcare uptake (e.g. by income or education) in high-income countries, with some Nordic exceptions (Krapf, 2014; Abrassart and Bonoli, 2015; Van Lancker and Ghysels, 2016; Van Lancker and Ghysels, 2012; Pavolini and Van Lancker, 2018; Van Lancker, 2017; Van Lancker, 2013; Ghysels and Van Lancker, 2011; Mamolo et al., 2011; Meagher and Szebehely, 2012; Hirshberg et al., 2005; Greenberg, 2011; Wood et al., 2023). Unlike a longer tradition of studying ethnic differences in formal childcare usage in the USA (e.g. Fuller et al., 1996; Greenberg and Hofferth, 1994; Greenberg and Kahn, 2012; Liang et al., 2000; West et al., 1995), our understanding of differential childcare uptake by migration background is more recent in other regions. Despite exceptions (e.g. higher daycare use by migrant mothers in Italy [Mussino and Ortensi, 2023]), a handful of studies generally find lower usage amongst groups with a migration background (e.g. Eremenko and Unterreiner, 2023; Biegel et al., 2021).

Research examining sub-group disparities in formal childcare uptake identifies both macro-level supply-side and micro-level demand-side factors as complementary explanations. Macro-level analyses compare countries, regions or time periods to address supply-side factors such as coverage (Maes et al., 2023b), affordability and fee structures (Abrassart and Bonoli, 2015; Pavolini and Van Lancker, 2018; Huston et al., 2002; Hirshberg et al., 2005), accessibility (Pavolini and Van Lancker, 2018), priority criteria (European Commission, 2014), government spending (Van Lancker and Ghysels, 2016; Van Lancker, 2017) and policy coherence (Krapf, 2014). Additionally, a significant body of literature examines micro-level factors influencing formal childcare uptake, potentially serving as demand-side explanations for sub-group differentials (Mamolo et al., 2011; van Gameren and Ooms, 2009; Hirshberg et al., 2005; Huston et al., 2002; Greenberg, 2011).

Unfortunately, hitherto it is largely unclear whether differential formal childcare usage by migration background can be explained by demand-side factors, such as household characteristics (e.g. cohabiting grandparents, residential location) (Burchinal et al., 2008; Vandenbroeck et al., 2008), socio-economic status (e.g. income, housing) (Sprong and Skopek, 2023), labour market positions (e.g. employment) (Bonizzoni, 2014; Maes et al., 2023a; Wall and Jose, 2004; Sprong and Skopek, 2023) or attitudes (Seibel and Hedegaard, 2017). The literature is lacking empirical tests of many demand-side explanations, studies considering the aforementioned explanations simultaneously and comparisons between countries. Consequently, this study addresses the question: To what extent can differences in formal childcare uptake between natives without a migration background, migrants

https://doi.org/10.1017/S004727942500008X Published online by Cambridge University Press

and migrants' descendants be explained by household characteristics, socio-economic status, employment and work–family attitudes in Europe and Australia?

This study contributes to the existing literature in four ways. First, we offer a relatively comprehensive examination of potential demand-side explanations, including demographic, socio-economic, employment-related and attitudinal characteristics. Whilst traditional attitudes towards work–family and formal childcare correlate negatively with formal childcare uptake (Steiber and Haas, 2012; van Gameren and Ooms, 2009; Fortin, 2005), their role as explanations for differential formal childcare uptake by migration background remains unknown. Second, we assess differential uptake between migrants and their descendants, as our understanding of such intergenerational differences remains limited. Third, some demand-side determinants of formal childcare uptake may also be consequences of formal childcare uptake (e.g. parental employment). To address this, our study estimates employment potential and predicted pre-parenthood attitudes towards maternal employment, which are unaffected by childcare uptake, as potential determinants of formal childcare uptake (Wood et al., 2023). Fourth, previous research on the extent to which demand-side predictors explain differences in formal childcare uptake has produced inconclusive findings, which may be attributed to not only contextual differences, but also varying research designs. To address this, our study examines formal childcare uptake by migration background in six European countries (Austria, Belgium, France, Germany, Russia, Sweden) and Australia, using comparable data and a fixed research design.

Background

Potential demand-side explanations for gaps in formal childcare uptake

On the basis of micro-economic theory emphasising trade-offs between childcare costs and potential gains concerning income and children's development (Blau and Currie, 2006), but also ideational theories highlighting the role of internalised preferences and socialisation (Steiber and Haas, 2012; van Gameren and Ooms, 2009; Fortin, 2005; Goerres and Tepe, 2012), we discuss four demand-side explanations for differential formal childcare uptake by migration background.

First, differential formal childcare uptake may reflect demographic characteristics. The number of children in the household potentially affects the probability of formal childcare uptake, as grandparents, for instance, are presumably less able to care for multiple grandchildren. Previous research also interprets higher formal childcare uptake for one- or two-year-olds in comparison with younger children in terms of preferences for parental care for young babies and parental leave uptake (Krapf, 2014; Huston et al., 2002; Hirshberg et al., 2005; Morgan and Zippel, 2003). Demographic variation in formal childcare uptake by age and location (e.g. urban–rural differences) are also repeatedly identified (Wood et al., 2023; Abrassart and Bonoli, 2015; Pennerstorfer and Pennerstorfer, 2021; Yerkes and Javornik, 2019). At the household level, co-resident grandparents are often considered a source of informal care, which might function as a substitute for formal childcare (Hirshberg et al., 2005; Wood et al., 2023; Biegel et al., 2021). The aforementioned demographic determinants are likely to play a role as partial explanations for differential uptake of

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formal childcare by migration background. Migrants in our data are more likely to have more children and live in urban areas with higher unmet need for childcare. Furthermore, migrants' descendants are more likely to live in multi-generation households with potential availability of informal childcare, which contrasts with the low prevalence of multi-generation households in groups without migration background or migrants. As a result of such compositional differences between the three groups considered, and the likely impact on formal childcare uptake, we expect that differential formal childcare use by migration background can be partly explained by these demographic characteristics (hypothesis 1).

Second, the available literature provides numerous empirical indications for differential formal childcare uptake by socio-economic status (e.g. education, wealth) (Krapf, 2014; Abrassart and Bonoli, 2015; Van Lancker and Ghysels, 2016; Van Lancker and Ghysels, 2012; Pavolini and Van Lancker, 2018; Van Lancker, 2017; Van Lancker, 2013; Ghysels and Van Lancker, 2011; Mamolo et al., 2011; Meagher and Szebehely, 2012; Kreyenfeld et al., 2003; Hirshberg et al., 2005; Greenberg, 2011; Wood et al., 2023). Positive effects of educational attainment are interpreted in terms of employment opportunities which already accumulate in early careers (Maes et al. 2021; Wood et al. 2016; Maes et al., 2019), or more positive attitudes towards outsourcing of childcare. In addition, household wealth impacts the affordability of childcare uptake (Del Boca and Vuri, 2007). Given that most migrant groups, and to a lesser degree their descendants, are lower educated and less wealthy than natives without a migration background, we expect that differential formal childcare use by migration background can be partly explained by socio-economic status (hypothesis 2).

Third, favourable employment opportunities entail high opportunity costs of taking care of young children (e.g. forgone wages) and enhance the affordability of formal childcare (Abrassart and Bonoli, 2015; Krapf, 2014; Pavolini and Van Lancker, 2018), whilst unstable precarious employment hinders planning of future care needs and restricts access to formal childcare (e.g. waiting lists). Migrants are on average more prone to unemployment or precarious employment characterised by flexible schedules, non-standard hours and short-term contracts, and research has underscored the challenges to accessing formal childcare faced by migrants in such situations (Bonizzoni, 2014; Wall and Jose, 2004; Biegel et al., 2021). As a result, we expect that differential formal childcare use by migration background can be partly explained by employment potential (hypothesis 3).

Fourth, differences in formal childcare uptake between migrants and natives may be partially attributed to attitudes. Available literature indicates that traditional views on maternal employment and formal childcare services are associated with lower childcare uptake (Steiber and Haas, 2012; van Gameren and Ooms, 2009; Fortin, 2005) and also provides some indications of more traditional attitudes amongst migrants (Seibel and Hedegaard, 2017), though evidence seems inconclusive with strong heterogeneity within migrant communities (De Valk, 2008; Wood et al., 2017; Wood, 2022). Given the theoretical possibility of differential attitudes, we hypothesise that differential formal childcare uptake by migration background can be partly accounted for by attitudes towards maternal employment (hypothesis 4).

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Cross-country differences

The degree of differential formal childcare uptake by migration background is likely to vary by country due to compositional and supply-side differences. First, the group composition of migrants and their descendants with young children varies between countries in terms of reason of migration (e.g. labour, education, family, humanitarian) and country of origin due to differential migration histories and migration policies. Additionally, cross-country variation in differential formal childcare uptake by migration background might also be related to variation in socio-economic compositional differences. Available literature indicates the largest foreign-native born gaps in employment in Western and Northern European countries (e.g. Belgium, Germany, France, Sweden), and more limited gaps in Anglo-Saxon countries (e.g. Australia) and Central and Eastern European countries (e.g. Russia) (Rubin et al., 2008; OECD, 2020). Second, differential uptake of formal childcare by migration background might also depend on supply-side factors. The extent to which lower socio-economic position and employment potential drive differential patterns of uptake by migration background potentially depends on the supply level which has been shown to affect social inclusiveness in uptake (Maes et al., 2023b). Supply meets demand in Nordic countries, yet not in other European countries or Australia (European Commission et al., 2014).

An assessment of all potential underlying explanations for cross-country differentiations in formal childcare uptake by migration background lies beyond the scope of this study, as low cell frequencies hamper the assessment of compositional features, such as origin country and reason of migration, and the number of countries included is too low to explain variation at the country-level reliably using contextual indicators. However, benefitting from the fact that this study is novel in using a standardised approach to estimate differential formal childcare uptake by migration background, we expect that differentials in the uptake of formal childcare by migration background vary depending on the country considered (hypothesis 5).

Data and method

Data

We use data from the Generations and Gender Survey (GGS), a multi-purpose cross-country survey under the Generations and Gender Programme (GGP), for seven countries: Australia (2005-2006), Austria (2008–2009), Belgium (2008–2010), France (2005), Germany (2005), Russia (2004) and Sweden (2012–2013). The survey employed face-to-face standardised interviews with rigorous random probability sampling procedures, targeting non-institutionalised residents aged 18–79 years. Response rates were comparable to other international surveys (Fokkema et al., 2016). Focussing on individuals residing with at least one biological child under the age of 3 years, and excluding participants with missing data on covariates (518 individuals), a sample of 4,056 parents was obtained. We use sample design weights to restore potential error (e.g. due to sampling designs or selective response patterns), and additional weights to ensure that each country sample equals one-seventh of the total sample.

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Due to varying immigration histories, the seven countries exhibit different minority groups in the analytical sample. In the Belgian and French samples, groups with a migration background include 68 per cent and 74 per cent of non-European origin, respectively, many of which originate from North-African or Turkish post-Second World War labour migration. The German and Austrian samples include, respectively, 45 per cent and 42 per cent non-European origin groups, a non-EU European origin group (e.g. Russian Federation) in Germany, and 66 per cent of all migrants originating from Turkey, Germany, Bosnia and Herzegovina, Romania, Serbia, Kosovo and Croatia in Austria. The amount of migrants who have been residing in the host country for more than 15 years is 48 per cent in France and Austria, and 25 per cent in Germany and Belgium. As Sweden witnessed post-Second World War immigration from Nordic countries, Germany and the Baltics, and later immigration peaks related to conflicts and humanitarian crises in the Balkan, West Asia or Africa, the sample with a migration background includes 46 per cent non-European origin groups, the majority of which originates from North Africa and West Asia. A total of 41 per cent of the migrants in the Swedish analytical sample were already residing in Sweden for 15 years or longer. Since Russia experienced immigration former soviet states from the 1990s onwards, 75 per cent of the sample of migrants and their descendants originate from Ukraine, Kazakhstan, Belarus, Azerbaijan and Moldova, with 35 per cent of migrants residing in the country for 15 years or longer. Finally, in line with Australian migration history including large Asian groups (e.g. Chinese origin), and immigrants from the commonwealth or Europe, 56 per cent of the migrants in the Australian sample are of European descent, and 27 per cent originate from Asian countries. The Australian analytical sample stands out, with 60 per cent of migrants residing in the country for 15 years or longer.

The GGS data allow us to distinguish natives from first-generation migrants and their descendants (see Table A1 in appendix for sample sizes). Unfortunately, low cell counts do not allow for the examination of migrant origin and generation simultaneously. However, we do perform additional robustness checks distinguishing natives without a migration background, migrants and their descendants from higher-income and lower-income countries or European versus non-European countries, without considering intergenerational differences between migrants and their descendants.

Method

The dependent variable of interest is the uptake of formal childcare, using the question, 'Do you get regular help with childcare from a day care centre, a nursery or pre-school, an afterschool care-centre, a self-organised childcare group, a babysitter, or from some other institutional or paid arrangement?' Although capturing a broader spectrum of practices than commonly used definitions of early childhood education and care services (ECEC), it complements standard definitions (e.g. Eurostat [EU-SILC]) of informal care by emphasising payment (OECD, 2019). The percentage of respondents reporting uptake of formal childcare in our analytical sample of individuals residing with at least one biological child under 3 years

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indicates that Belgium and France typically approximate the high levels of childcare coverage in Nordic countries during the 2000s, in line with the available literature. The percentage is the highest in Sweden (69 per cent), France (54 per cent) and Belgium (51 per cent). Austria, Germany and Australia exhibit lower levels, at 38–39 per cent, and the lowest percentage is found in Russia (29 per cent). Although these percentages, unlike official statistics, cannot be interpreted as reliable estimates due to differences in definition, self-reporting and sampling variation, this is not considered problematic in this study which addresses within-country differences by migration background, rather than cross-national differences in overall uptake. There are no indications that the aforementioned sources of bias might function differentially by migration background.

We employ a country fixed-effects logit model to address differential formal childcare use by migration background within countries. This method incorporates country dummies as fixed effects into the regression model, allowing for within-country interpretations of covariate effects and reducing bias in estimated predictor effects resulting from different distributions across countries. The null model includes country fixed effects, migration background (natives without a migration background, migrants, migrants' descendants) and interactions between country and migration background. Using effects coding for country dummies implies that the main effect of migration background is the grand mean of the country-specific differentials. Additionally, the null model also includes sex, as the sampling design targeted both male and female respondents and available literature documents sex differences in reporting of topics related to (un)paid work (e.g. Press and Townsley, 1998).

We compare five nested regression models with the null model to evaluate whether differential childcare uptake by migration background alters when various potential statistical explanations are considered. As logit model covariate estimates are incomparable across nested models due to unobserved heterogeneity, we calculate average marginal effects (Mood, 2009). First, model 1 controls for demographic background variables known to influence the demand for formal childcare (Krapf, 2014; Huston et al., 2002; Hirshberg et al., 2005). With respect to children's characteristics, we control for the number of resident children (one, two, three, four or more) and the age of the youngest child (0, 1 or 2 years). At the parental level, we control for age (linear and square). At the household level, we control for presence of co-resident grandparents, residency in an urban and/or capital region and type of household (distinguishing married couples, from unmarried couples and single parent households).

Second, model 2 estimates differential formal childcare use by migration background, incorporating socio-economic status indicators. We distinguish low education (ISCED 0–2) from medium levels (ISCED 3–4) and higher tertiary degrees (ISCED 5–6). In addition, to capture wealth which might affect the affordability of formal childcare, we use commonly adopted proxy variables for wealth (e.g. Gadeyne, 2006): home ownership and the amount of rooms relative to the household size.

Model 3 tests the explanatory power of employment potential for gaps in formal childcare uptake by migration background. We follow previous research (Maes et al. 2023a; Wood et al., 2023) and estimate 'employment potential' representing

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respondents' employment probability if childless, which cannot be affected by formal childcare uptake (see appendix for equations). Using a sample of 19,552 childless respondents, two logistic regressions estimate employment probabilities of male and female respondents separately as a function of (interactions between) country, subnational region, age, educational attainment (low, medium, high), migration background (native, first generation, second generation), number of siblings (1, 2, 3, 4 or more), whether respondents lived with their parents until the age of 15 years and educational attainment of respondents' father and mother (low, medium, high, unknown). Similarly, using a sample of 16,205 childless respondents with a cohabiting partner, two logistic regressions are performed to estimate the employment probabilities of male and female respondents' partners. Subsequently, matching for the covariates included in the models for employment potential, the estimated probabilities for childless individuals are attributed to their counterparts with children as a measure of their employment potential.

Model 4 estimates gradients in formal childcare uptake, controlling for attitudes towards maternal employment, measured with the statement 'A pre-school child is likely to suffer if his or her mother works', with response options ranging from 'strongly agree to 'strongly disagree' in a 5-point Likert scale. This question has also been used in previous research (Pavolini and Van Lancker, 2018; Wood et al., 2023). Given evidence that working mothers who use formal childcare develop more positive attitudes over time (Steiber and Haas, 2012), we use predicted childless attitudes. These attitudes are estimated separately for men and women for the aforementioned childless sample as a function of the same vector of indicators as the estimation of respondents' employment potential. The estimated probabilities for childless individuals are attributed to their counterparts with children. Consequently, predicted attitudes are likely to reflect an individual's attitudes towards maternal employment, net of any adjustments made after childbearing and (non-)uptake of formal childcare.

Finally, the full model (model 5) includes demographic characteristics, socio-economic status, employment potential and predicted attitudes.

Results

Differential formal childcare use and demand-side characteristics

Figure 1 illustrates deviations in the probability of formal childcare uptake amongst migrants and their descendants, in comparison with natives without a migration background. As the average probability of formal childcare uptake varies across countries, the average marginal effects of migration background are expressed as a percentage of the mean uptake per country. A corresponding figure with absolute deviations is provided in the appendix (see Figure A1).

On average across all countries, the null model indicates a significantly negative differential for first-generation migrants (Figure 1.1). The mean gap equals 20 per cent of the average probability of uptake in a country. However, this differential is not significant in Russia, Austria and Australia. Sweden stands out with a significantly higher probability of formal childcare uptake for first-generation migrants. The largest negative differentials occur in Germany and Belgium,

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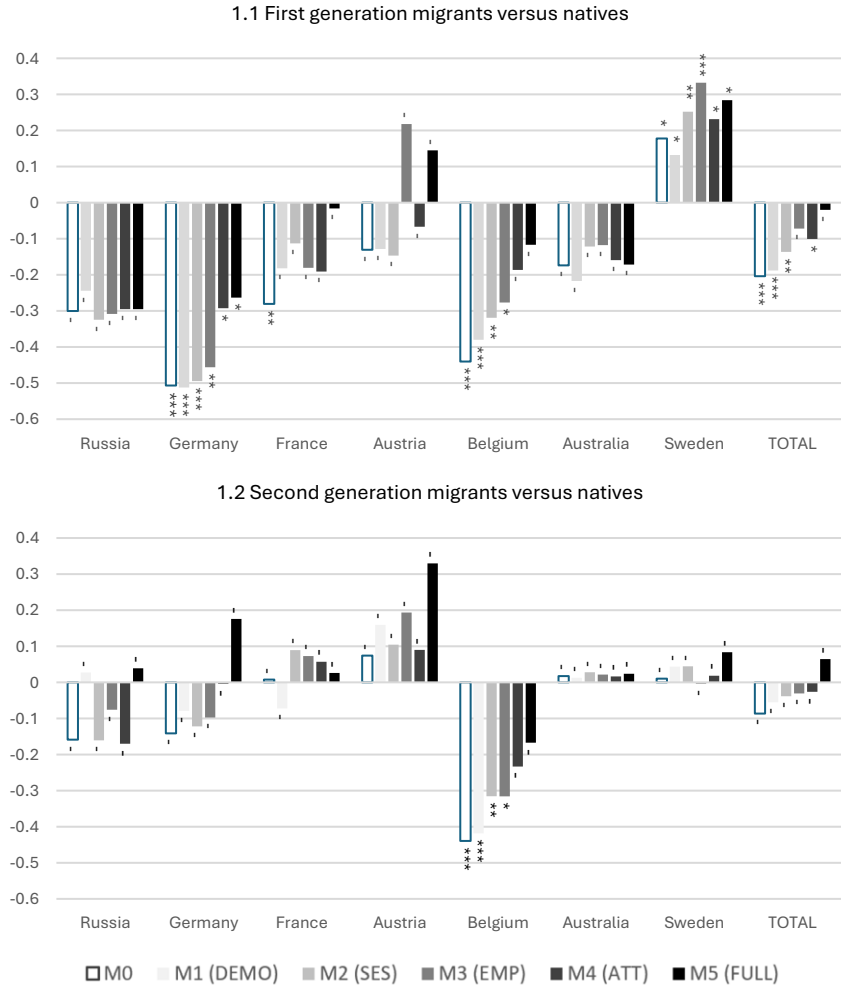

Figure 1. Relative deviations in the probability of formal childcare uptake (i.e. average marginal effects/average probability by country) amongst first-generation migrants (1.1) and second-generation migrants (1.2) in comparison with natives.

Source: Generations & Gender Survey (GGS) wave 1, calculations by authors M0 (null model); M1 (demographic control variables); M2 (controlling for socio-economic status); M3 (controlling for employment potential); M4 (controlling for predicted attitudes towards maternal employment); M5 (full model controlling for all covariates).

exhibiting a gap between natives without a migration background and first-generation migrants amounting to 51 per cent and 44 per cent, respectively, of the mean probability of uptake.

With respect to migrants' descendants (Figure 1.2), estimations indicate that there is much less consistency in the direction of the differential, but also that the magnitude of the deviations is smaller. For all countries but Belgium, the deviation does not reach statistical significance. The Belgian sample, however, indicates a negative differential in formal childcare uptake for migrants' descendants similar to

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the results for migrants. Although comparing these results with previous studies using different indicators is cumbersome, it is noteworthy that the relative positioning of the countries aligns with studies focussing on socio-economic differentiation, with relatively strong differentials in Belgium and France; weaker gradients in Germany and Austria; and the weakest to virtually non-existent gradients in Sweden (Pavolini and Van Lancker, 2018; Ghysels and Van Lancker, 2011; Wood et al., 2023).

Micro-level factors as explanation for differential formal childcare uptake

This section presents the results of multivariate regression models taking into account demographic characteristics, socio-economic status, employment potential and predicted attitudes towards maternal employment. With respect to demographic characteristics, Table 1 indicates that – when using linear regression models to estimate gaps in demographic composition controlling for between-country differences – first-generation migrants are on average interviewed slightly later in calendar time, but also have more resident children and are more likely to reside in highly urban and/or capital regions. When comparing migrants' descendants to natives, the only statistically significant difference is that migrants' descendants are more likely to live in highly urban and/or capital regions. Controlling for a set of demographic characteristics (Figure 1) – on average across countries – entails a weakening of the negative differential formal childcare uptake from 20.4 per cent to 18.8 per cent of the average probability of uptake for first-generation migrants, and from 8.7 per cent to 5.5 per cent for migrants' descendants. The degree to which differential uptake of formal childcare by migration background can be accounted for by these demographic characteristics varies markedly between countries. With respect to first-generation migrants, controlling for demographic composition entails a weakening of the insignificant differential in Russia, and the significant negative differential in Belgium, Sweden and France, with the latter turning statistically insignificant. In contrast, results for Germany, Austria and Australia indicate stable or even increasing differentials after controlling for demographic composition. With respect to migrants' descendants, the aforementioned limited differentials in most countries remain small, whereas the relatively large negative differential in Belgium largely persists after controlling for demographic characteristics. Regression estimates provided in Table 2 identify age of the youngest child and number of resident children as significant predictors of formal childcare uptake, with markedly higher childcare uptake amongst two- and three-child parents.

Regarding socio-economic status, Table 1 presents that groups with a migration background, and particularly first-generation migrants, exhibit lower socio-economic status. First-generation migrant groups are on average more likely to be lower educated. This negative differential in terms of educational attainment partly extends over to migrants' descendants, who are also less likely to be highly educated in comparison with natives without a migration background. Additionally, both migrants and their descendants exhibit a significantly lower probability of home ownership and less rooms per capita. The multivariate regression results of model 2 (Table 2) indicate that highly educated parents are more likely to use formal

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Table 1. Migrant native differentials in demographic characteristics, socio-economic status, employment potential and predicted attitudes towards maternal employment, effects from fixed-effects linear regression models, 7 GGS countries 2004–2013

	First-generation versus natives		Second-generation versus natives	
	diff	*sig*	*diff*	*sig*
Country fixed effects				
. *effect coding dummies*	incl.		incl.	
	Demographic characteristics			
year				
. *linear*	0.035	*	0.032	
Sex of sampled respondent				
. *female*	−0.013		−0.012	
Household type (*married couple is reference*)				
. *unmarried cohabiting*	−0.165	***	−0.018	
. *single parent*	−0.005		0.002	
Number of resident children				
. *linear*	0.140	***	−0.047	
Age of the youngest resident child				
. *linear*	0.061		−0.008	
Age respondent				
. *linear*	0.078		−0.454	
Grandparents in household				
. *yes*	−0.001		0.015	
Highly urban/capital region				
. *yes*	0.082	***	0.101	***
	Socio-economic status			
Education				
. *low*	0.128	***	0.013	
. *middle*	−0.087	***	0.039	
. *high*	−0.041	***	−0.054	***
. *unknown*	−0.001		0.002	
Homeowner (*no is reference*)				
. *yes*	−0.233	***	−0.110	***
Rooms relative to household size				
. *linear*	−0.211	***	−0.062	***

(*Continued*)

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Table 1. (*Continued*)

	First-generation versus natives		Second-generation versus natives	
	diff	*sig*	*diff*	*sig*
	Employment potential			
Employment potential				
. *respondent*	−0.055	***	−0.030	***
. *partner*	−0.070	***	−0.034	***
	Predicted attitudes towards maternal employment			
Progressive attitudes towards maternal employment				
. *linear*	−0.184	***	−0.078	***

Notes: As a result of the usage of effects coding for country fixed effects, the main effects of education can be interpreted as the average effect across countries. Significance levels: $*p < 0.050$, $**p < 0.010$, $***p < 0.001$. *Source*: GGS wave 1, calculations by authors.

Table 2. Average marginal effects from country fixed-effects logit models of couples' formal childcare uptake, fifteen GGS countries, 2002–2013

	Model 1		Model 2		Model 3		Model 4		Model 5	
	AME	*sig*	*AME*	*sig*	*AME*	*sig*	*AME*	*sig*	*AME*	*sig*
					Survey design variables					
Gender of sampled respondent (*male is reference*)										
. *female*	0.017								0.228	
					Migrant-native differential					
Migration background (*native is reference*)										
. *first generation*	−0.085	***	−0.062	**	−0.033	***	-0.046	*	−0.009	
. *second generation*	−0.025		−0.017		−0.014		−0.012		0.029	
. *migration*country*[1]	incl.		incl.		incl.		incl.		incl.	
Country fixed effects										
. *effect coding dummies*	incl.		incl.		incl.		incl.		incl.	
					Demographic characteristics					
year										
. *linear*	0.004								0.001	
Household type (*married couple is reference*)										
. *unmarried cohabiting*	−0.025								−0.012	***
. *single parent*	0.087								0.229	***
Number of resident children (*one child is reference*)										
. *two*	0.224	***							0.235	***
. *three*	0.180	***							0.221	***
. *four or more*	0.108	***							0.181	***

(*Continued*)

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Table 2. (*Continued*)

	Model 1		Model 2		Model 3		Model 4		Model 5	
	AME	*sig*	*AME*	*sig*	*AME*	*sig*	*AME*	*sig*	*AME*	*sig*
Age of the youngest resident child (*0 years is reference*)										
. 1 year	0.136	***							0.136	***
. 2 years	0.235	***							0.237	***
Age respondent										
. linear	0.004	**							0.001	
Grandparents in household										
. yes	−0.067								−0.014	
Highly urban/capital region										
. yes	0.034	*							0.013	
Socio-economic status										
Education (*lowest is reference*)										
. middle			0.016						−0.024	
. high			0.130	***					0.036	
. unknown			0.018						−0.045	
Homeowner (*no is reference*)										
. yes			0.109	***					0.043	***
Rooms relative to household size										
. linear			−0.048	*					0.025	
Employment potential										
Employment potential (*probabilities*)										
. male respondent					0.030	*			0.023	
. female respondent					0.049	***			0.045	*
. male partner					0.016				0.020	
. female partner					0.077	***			0.034	*
Attitudes towards maternal employment										
Progressive attitudes towards maternal employment (*predictions*)										
. linear							0.016	***	0.015	***
Model parameters										
df.	74		51		50		29		138	
−2LL	4454.39		5546.01		5058.91		5152.02		4179.05	
Δ−2LL	773.64	***	211.02	***	169.13	***	76.01	***	1048.99	***
N	4,051		4,051		4,051		4,051		4,051	

Notes: As a result of the usage of effects coding for country fixed effects, the main effects of education can be interpreted as the average effect across countries. Significance levels: $^{*}p < 0.050$, $^{**}p < 0.010$, $^{***}p < 0.001$ *Source*: GGS wave 1, calculations by authors.

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childcare, and that homeowners also exhibit higher probabilities of formal childcare uptake, in addition to an unexpected negative association between formal childcare use and rooms relative to household size. The latter association can be explained by the impact of the number of children on household size, an interpretation which is supported by the fact that this association disappears when controlling for number of children in the full model (model 5). Regarding differential formal childcare usage (Figure 1), findings show that variation in socio-economic status accounts for a considerable part of the gaps in formal childcare uptake. Compared with the null model, the differential uptake for first-generation migrants shifts from 20.4 per cent to 13.6 per cent when controlling for level of education and housing characteristics, whereas the corresponding gap for migrants' descendants shifts from 8.7 per cent to 3.8 per cent. This average finding masks variation between countries. The clear explanatory power in reducing or even reversing negative differentials in France and Belgium, and to a lesser degree in Australia and Sweden, contrasts with little-to-no explanatory power of socio-economic status in Russia, Germany and Austria.

With respect to employment potential, migrants' descendants and particularly migrants themselves display lower estimated employment potential (Table 1), in line with available literature (OECD, 2020). Model estimates indicate positive associations formal childcare uptake and employment potential, particularly the employment potential of female respondents or female partners (Table 2, model 3), but also that migrant–native gaps decrease when taking the effect of employment potential into account (Figure 1). Compared with the null model, the negative differential in formal childcare uptake for migrants and their descendants shifts from 20.4 per cent to 7.2 per cent and from 8.7 per cent to 3.1 per cent, respectively, when controlling for employment potential. It is noteworthy that, when focussing on the average pattern across countries, the model controlling for employment potential is the only model (except the full model) in which differential formal childcare uptake for migrants vis-à-vis natives without a migration background is no longer statistically significant. However, the extent to which differentials in formal childcare uptake can be explained by differences in employment potential also varies strongly by country. In most countries the explanatory value of employment potential as explanation for differential formal childcare uptake by migration background is similar or even stronger than socio-economic status, such as is the case in Russia, Germany, Belgium, Australia, Sweden and migrants' descendants in Austria, whilst the explanatory value of employment potential is weaker yet still notable for France. The gap between natives without a migration background and first-generation migrants in Austria even reverses from a negative gap to a positive difference when controlling for employment potential.

Regarding attitudes, migrants' descendants and particularly migrants themselves on average exhibit significantly lower predicted scores on a seven-point scale of progressive attitudes towards maternal employment (Table 1). The multivariate regression results of model 4 (Table 2) indicate that predicted progressive attitudes towards maternal employment associate positively with formal childcare uptake. Estimates of formal childcare uptake by migration background (Figure 1) indicate that the average degree of differential formal childcare uptake across countries decreases when comparing the null model with a model controlling for predicted attitudes towards maternal employment. For migrants the gap decreases from 20.4

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per cent to 10.1 per cent and for migrants' descendants it decreases from 8.7 per cent to 2.6 per cent. However, the differential uptake amongst migrants remains statistically significant. With respect to cross-country variation in the explanatory power of attitudes, the reduction of negative differentials (or strengthening of positive differentials) in uptake is similar or weaker in comparison with socio-economic position and/or employment potential in Russia, France, Austria, Australia and Sweden. The results for migrants and their descendants in Belgium and migrants in Germany stand out, as the weakening of the differential is larger than for all other aforementioned models in these two countries.

When combining demographic characteristics, socio-economic status, employment potential and predicted attitudes towards maternal employment in one multivariate model (model 5), findings (Table 2) indicate higher formal childcare uptake amongst single parents, parents with more than one child, parents with a slightly older under-three year old in the household, homeowner parents and parents with a higher employment potential. Additionally, Figure 1 illustrates the remaining differentials in formal childcare usage by migration background. On average across all seven countries, uptake gaps decrease from 20.4 to 2.0 per cent lower uptake amongst first generations migrants and 8.7 per cent lower to 6.4 per cent higher uptake amongst migrants' descendants. Hence, the already limited negative differential for migrants' descendants has been reversed, whereas only a marginal negative gap for first-generation migrants persists after controlling for the combined explanatory power of demographic characteristics, socio-economic status, employment potential and predicted attitudes towards maternal employment.

However, country-specific results indicate cross-country variation in the persistence of differential formal childcare usage by migration background. Differential uptake for migrants and descendants in Australia and migrants in Russia seem resistant to our control variables. Results for Germany show that the negative differential for migrants is halved, whereas the original negative differential for migrants' descendants is reversed. In France the negative differential for migrants is mostly explained. In Austria we find a reversal of the gap for migrants, and strengthening of a positive differential for their descendants. In Belgium the original gaps without controls are approximately triple the size of the remaining gaps after including all control variables. Finally, results for Sweden indicate that the negative differential in formal childcare uptake for migrants is almost completely explained, whereas the moderate negative gap for their descendants is reversed when including all control variables.

Sensitivity analyses

To test the robustness of our findings, we ran five (groups of) sensitivity checks. First, the main analyses include both educational attainment and housing characteristics as indicators for socio-economic status. However, spending power and the ability to purchase a (large) home could be endogenous to formal childcare uptake (via employment, wages and access to credit). Results of model 2 without housing characteristics (see Figure A2, model 2, excl. H, in appendix) indicate slightly stronger migrant–native gaps in formal childcare uptake compared with the

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model including housing factors for migrants (−13.6 versus −16.9 per cent) and their descendants (−3.8 versus −5.9 per cent).

Second, as it is theoretically possible that lower formal childcare amongst migrants and their descendants results from using informal childcare and/or parental leave, we ran models including a dummy indicator for the informal childcare use (see Figure A2, model 6 [INF] in appendix) and a model including a dummy indicator for parental leave uptake (see Figure A2, model 7 [LEAVE] in appendix). On average across countries, but also within most countries, these indicators seem to explain a very large part of negative differentials in formal childcare uptake, and also drive reversals of differentials. However, as the use of informal childcare and parental leave are likely to be endogenous, that is, the result of (non-)take up of formal childcare, these control variables are not used in the main analyses.

Third, as the GGS for Belgium, France, Russia, Austria and Sweden also includes the question (five-point Likert scale) whether care for pre-school children is a task for society, both or the family, we assessed the explanatory power of this indicator (see Figure A2, model 8 in appendix). On average across countries, this indicator explained a share of differential uptake for migrants similar to the model including predicted attitudes to maternal employment, yet the explanatory power is more limited for Belgium and drives an even stronger reversal to a positive gradient in Sweden.

Fourth, we re-ran all models distinguishing natives without a migration background from European country origin groups, and non-European origin groups, without comparing generations, which is not possible due to low cell frequencies. The results (see Figure A3 in appendix) in terms of statistical explanation of demographic composition, socio-economic status, employment potential and work–family attitudes are similar to the main results. Analyses distinguishing high-income from lower-income origin countries similarly do not alter the main findings.

Fifth, several variations of the estimation procedure for employment potential were tested. We omitted migration background from the equations for employment potential. In addition, instead of the main analyses in which single parents are assigned the employment probability of a partner on the basis of similar profiles of childless individuals with a partner, we also re-ran the models using an indicator of partners' employment potential, which is set to zero for all single parents. Additionally, we ran all models using an estimation of employment potential at the household level, modelling whether any present partner is not working. None of these variations alter the main results of the study.

Discussion

Notwithstanding a relative scarcity of empirical research on formal childcare uptake by migration background in comparison with the large body of research addressing gradients in uptake by income or level of education, a handful of studies report lower uptake rates for migrants and their descendants in comparison with natives (Maes et al., 2023b; Eremenko and Unterreiner, 2023; Biegel et al., 2021; Sprong and

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Skopek 2023), similarly to ethnic gaps in the uptake of parental leave in many high-income countries (Kil et al., 2018; Marynissen et al. 2021). Given the numerous potential benefits of formal childcare enrolment for parents, children and society as a whole, this pattern is cause for concern amongst policy-makers and social policy scholars. As the available literature provides little information on potential explanations for differential formal childcare uptake by migration background, this study assesses the statistical explanatory power of four groups of demand-side characteristics: demographic characteristics, socio-economic status, employment potential and predicted attitudes towards maternal employment. Using comparable data for seven countries, this study reports negative differentials in formal childcare uptake for first-generation migrant groups except in Sweden, which resonates with previous cross-national research on socio-economic differentiation in formal childcare uptake, finding the weakest to virtually non-existent gradients in Sweden (Pavolini and Van Lancker, 2018; Ghysels and Van Lancker, 2011; Wood et al., 2023). Migrants' descendants exhibit relatively weak differential formal childcare uptake compared with natives without a migration background, despite strong negative gradients in Belgium, in line with previous research (Biegel et al., 2021).

There are three main lessons to be drawn from this study. First, the overarching question is: Can differentials in formal childcare uptake by migration background be explained by the observed demand-side factors? Our findings indicate that – whereas differentials for migrants' descendants are limited and insignificant even without controlling for background variables – the average negative differential for migrants across all countries disappears almost completely and is no longer statistically significant after controlling for demographic characteristics, socio-economic status, employment potential and predicted attitudes towards maternal employment.

Second, there is no clear dominant demand-side statistical explanation for differential formal childcare use by migration background. Overall, demographic characteristics, socio-economic status, employment potential and attitudes towards maternal employment collectively contribute to understanding lower formal childcare uptake amongst migrants' descendants and particularly migrants themselves. Controlling for demographic composition reduces the gap in formal childcare usage, particularly amongst first-generation migrants (hypothesis 1). Socio-economic status also plays a significant role, as migrants generally exhibit lower educational attainment and homeownership rates, and highly educated parents and homeowners are found more likely to use formal childcare (hypothesis 2), in line with previous research (Krapf, 2014; Wood et al., 2023). Contributing to the existing literature on the linkage between employment and formal childcare uptake (Van Lancker and Ghysels, 2012; Van Lancker, 2013; Krapf, 2014; Abrassart and Bonoli, 2015; Hirshberg et al., 2005; Mamolo et al., 2011; Greenberg, 2011), we also show that the employment potential of migrants and their descendants also influences formal childcare uptake, with lower predicted employment probabilities associated with lower uptake. On average across countries, the explanatory power of employment potential seems stronger than all other background characteristics as potential explanations for gaps in uptake between natives without a migration background and migrants (hypothesis 3). In line with previous research (Steiber and Haas, 2012; van Gameren and Ooms, 2009; Fortin, 2005), attitudes towards

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maternal employment also impact childcare uptake, with migrants exhibiting less progressive attitudes on average, and weakening negative differential uptake for migrants and their descendants after controlling for such attitudes (hypothesis 4).

Third, in line with expectations (hypothesis 5), country-specific results indicate cross-country variation in differential uptake by migration background and the explanatory power of different demand-side factors. Despite the fact that future research on such cross-sectional variation using a larger set of countries should be encouraged, we speculate on potential reasons for such cross-country differences. Given that employment potential explains most of the differential formal childcare uptake between migrants and natives without a migration background, and the country-ranking of the identified gaps seems to align with available literature on gradients by income or socio-economic status (Pavolini and Van Lancker, 2018; Ghysels and Van Lancker, 2011; Wood et al., 2023), we speculate that cross-national variation in labour market inequalities and design features of formal childcare might play a role. This assumption resonates with previous research highlighting socio-economic position and employment as key explanations for unequal uptake of formal childcare by migration background (Thil et al., 2023; Eremenko and Unterreiner, 2023, Biegel et al., 2021). We find the strongest significant negative differential for formal childcare uptake for migrants in some Western European countries – Belgium, Germany and to a lesser degree, France – contexts with strong employment differentials for migrants (OECD, 2020; Rubin 2008). These findings align with available research highlighting the importance of socio-economic position and employment as explanations for differential formal childcare uptake by migration background in Belgium and France (Eremenko and Unterreiner, 2023, Biegel et al., 2021). We find more limited gradients in Austria, Australia and Russia, which are also countries with more limited differences in labour market outcomes (OECD, 2020).

Additionally, our speculation that the design features of formal childcare also affect the degree of differential uptake by migration background seems supported by the positive differential for migrants in Sweden, a context with high coverage and accessibility and weak socio-economic differentiation in formal childcare uptake (Pavolini and Van Lancker, 2018; Ghysels and Van Lancker, 2011). Hence the relatively large employment gaps between natives without a migration background and migrants in Sweden presumably do not translate into negative gradients such as in the Western European countries, as formal childcare supply typically meets demand (European Commission et al., 2014). As such, this study complements research suggesting that supply-side factors such as policy design features, access to information or geographic differences in childcare shortages should also be taken into account to fully grasp inequalities in formal childcare usage (Abrassart and Bonoli, 2015; Pavolini and Van Lancker, 2018; Vandenbroeck et al., 2014).

In addition to the importance of socio-economic position and employment, it is noteworthy that the explanatory power of attitudes seems largest in Belgium and Germany, also the countries with the largest differentials in formal childcare uptake by migration background. Despite the fact that this finding aligns with previous research indicating that migrants are less in favour of formal childcare than natives in Germany (Seibel and Hedegaard, 2017), the available literature on migrants' attitudes concerning these topics in different countries is too premature to speculate

https://doi.org/10.1017/S004727942500008X Published online by Cambridge University Press

on the reasons for cross-sectional variation in the importance of attitudes as a potential explanation of formal childcare uptake by migration background.

The findings of this study hold significant implications for policy discussions surrounding the social investment paradigm, social inclusion and inequalities in formal childcare coverage (e.g. Hummel et al., 2023; Pennerstorfer and Pennerstorfer, 2021; Bonoli, 2020; Yerkes and Javornik, 2019; Van Lancker and Ghysels, 2012). In addressing differential formal childcare use by migration background, the study sheds light on the multi-faceted nature of demand-side factors influencing access to formal childcare services. By comprehensively examining demographic, socio-economic, employment-related and attitudinal characteristics, the study underscores the complexity of addressing such gaps, which might contrast with stereotypical mono-causal explanations in popular debates.

Finally, we present three avenues for future research. First, future research on explanations for differential formal childcare use by migration background should compare different generations and origin groups simultaneously, whilst addressing differentiation by reason for migration and length of stay, which requires sample sizes considerably larger than those available in the GGS. Second, the GGS data provide variables which would be unavailable in other types of data (e.g. lack of attitudes in administrative data). However, the data do not include information on intensity or timing of uptake, knowledge of formal childcare systems (Hummel et al., 2023), local-level contextual variables (e.g. childcare provision or regional level care cultures) (Pennerstorfer and Pennerstorfer, 2021) or the proximity of potential informal care (e.g. grandparents) (Biegel et al., 2021), which require further attention. Third, future research should address potential explanations for cross-country differences in the gaps and underlying explanations due to compositional and contextual differences, providing more information on how demand-side (e.g. employment position) and supply-side features (e.g. priority rules or childcare shortages) (e.g. EllingsÆTer and Gulbrandsen, 2007) might interact in shaping subgroup differentials in formal childcare uptake. Such a study requires larger sample sizes to study the composition of groups with a migration background in more detail, and a larger set of countries to employ contextual indicators.

Supplementary material. The supplementary material for this article can be found at https://doi.org/10.1017/S004727942500008X

Acknowledgements. This research was funded by the Research Foundation Flanders (FWO grant no. 12ZA821N: COPE Project, G096321N and G0AHS24N), and the Research Council of the University of Antwerp (BOF: SEP-ERC Wood).

Competing interests. The author(s) declare none

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Cite this article: Wood, J. (2025) Differential formal childcare uptake amongst migrants and their descendants in Europe and Australia: the role of socio-economic status, employment and work–family attitudes. *Journal of Social Policy* 1–22. https://doi.org/10.1017/S004727942500008X