UNIVERSITY OF SOUTHAMPTON
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Exploring relationships between international migration and family formation in the United Kingdom

by

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ABSTRACT

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EXPLORING RELATIONSHIPS BETWEEN INTERNATIONAL MIGRATION AND FAMILY FORMATION IN THE UNITED KINGDOM

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This research provides some of the first quantitative analyses of the family patterns of Polish and Other A8 groups in the UK and compares their migration experience with that of other recent migrants from Pakistan, Bangladesh and India, for whom migration is more commonly thought to be related to family formation. The analyses fill a gap in the literature by offering insight into the trends underlying current foreign-born fertility patterns, in the wider context of increasing UK immigration, increasing shares of UK births to foreign-born mothers and compositional changes in these patterns since 2001.

The research uses a pooled sample of UK Labour Force Survey data, combining quarters from 2001-2009, to ensure sufficient sample sizes. A series of binomial logistic regressions are fitted to predict the probability of being partnered and of being a parent, first for recent migrants in comparison to other groups and then for more detailed analyses amongst the recent migrant groups. Own Children Methodology is then used to estimate the fertility patterns of the recent migrant groups so that the timing of births can be analysed in relation to the timing of migration.

The findings show that the probabilities of being partnered for the 20-34 years age groups studied here are much higher for females, with it seemingly more common for males to migrate without partners than for females. In this respect, the experience of A8 females is similar to that of South Asian females, but they differ with regards to the relationship between the migration event and partnership status. For South Asian females, the pattern is consistent with marriage migration, whilst this is not the case for the A8 groups.

The probabilities of being parents are found to be relatively low for male recent migrants, even amongst those who are partnered, except amongst the Pakistani and Bangladeshi males. For females, the differences in parent status are also pronounced between country of birth groups, with Polish and Other A8 females having lower parent probabilities than the South Asian groups.

Own Child fertility estimates confirm that the fertility of the Polish group is relatively low, characteristic of that at origin. For young South Asian migrant females, evidence is found for family formation related migration, with high proportions arriving to the UK childless and having births soon after arrival. For the Polish females, this phenomenon exists at younger ages but is less common, and those in their early thirties more commonly join partners who arrived to the UK previously, and bring their children with them.

The findings illustrate that whilst the nature of migration is very different for A8 and South Asian females, for both groups migration is often indirectly or directly related with being partnered and having children, but that this manifests in different ways, relating to the nature of migration undertaken and the different socio-legal contexts for migrants from these flows. The findings contradict the popular belief that recent Polish migrants to the UK are primarily single, with the migration and family reunification process occurring quickly for this group who have relative ease of movement within the European Union.

Contents

List of Figures

List of Tables

Declaration of Authorship

I, Lorraine Waller, declare that the thesis entitled

'Exploring relationships between international migration and family formation in the United Kingdom'

and the work presented in the thesis are both my own, and have been generated by me as the result of my own original research. I confirm that:

- this work was done wholly or mainly while in candidature for a research degree at this University;
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- where I have consulted the published work of others, this is always clearly attributed;
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- none of this work has been published before submission

Signed: .....

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Chapter 1

Introduction

In recent years, immigration has been particularly important for the United Kingdom (UK) in terms of population growth and redistribution, contributing to the composition of the population and ethnic change. Low fertility levels combined with increasingly high levels of immigration to the UK, have meant that net migration overtook natural change[1] as the biggest contributor to the growth of the UK population in 1999. Indeed, net migration has accounted for UK population growth to a greater extent than natural change up until 2008, when natural change overtook net migration for the first time since 1998.

The increase in the contribution of natural change to population growth is largely associated with recent rises in UK fertility, which have been partially driven by foreign-born childbearing, with immigration continuing to have an important indirect effect in UK population growth. For example, the large inflows of migrants to the UK during the 2000s have resulted in an increase in the numbers of females at childbearing ages. This is exemplified in the substantial increases in the proportions of UK births occurring to foreign-born women over the past decade or so. Whilst 14.3% of births within England and Wales in 1999 occurred to women born outside of the UK, the comparable figure for 2009 is 24.7% of births[2](Office for National Statistics, 2010a).

The fertility of the foreign-born population as a whole is higher than that of the UK-born population, meaning that their increasing share of childbearing will contribute to increases in UK fertility levels. Fertility has also risen due to an increase in the fertility of UK-born women of all ages with the UK Total Fertility Rate (TFR)[3]

[1]Net migration refers to the difference between immigration and emigration, whilst natural change refers to the difference between the number of births and deaths.

[2]Note that whilst these figures refer to England and Wales here, the situation for the whole of the UK is very similar.

[3]A Total Fertility Rate (TFR) is the sum of the Age-Specific Fertility Rates (ASFRs) for a period of interest (if the ASFRs are based on five-year age groups, the sum is also multiplied by five). An ASFR is the number of live births occurring to women of a defined age in a defined time period divided by the number of all women of that defined age in the defined time period. ASFRs are expressed as births per 1,000 females. Thus, the TFR measures fertility rates in the period of interest for a synthetic cohort, reflecting the average number of children these women would have if they experienced the current ASFRs throughout their reproductive careers.

consistently rising from 1.63 in 2001 to 1.96 in 2008, the highest UK TFR since 1973 (Office for National Statistics, 2009e). However, recently published estimates for 2009 suggest that fertility of UK-born women has experienced a slight decrease in the 2008-2009 period due to a decrease in the proportion of UK-born women at childbearing ages (Office for National Statistics, 2010a).

Despite the importance of foreign-born fertility within the UK, relatively little is known about the context within which this childbearing is occurring, particularly for recent migrants. Most of the quantitative evidence regarding migrant fertility and family composition is based on 2001 census data. However, since this time, there have been well documented, important changes in the nature of immigration to the UK. With the accession to the European Union (EU) of the 'A8' countries[4] in May 2004, there have been large inflows of migrants originating from these countries. In particular, 71% of immigrants to the UK from these eight countries from 2004 have been from Poland (Office for National Statistics, 2010b). Whilst the numbers of Polish immigrants arriving in the UK decreased, and emigration increased, in 2008, the Polish population within the UK remains substantially large. In December 2009, Polish-born individuals constituted one of the three largest non-UK born groups in all UK countries and regions, with the only exception being in London where they constituted the fourth largest non-UK born group (Office for National Statistics, 2010b). Furthermore, Poland has moved from not featuring in the ten most common countries of birth of non UK-born mothers having live births within England and Wales in 2004 to becoming the second most common country of birth in 2008. Alongside Poland in the top four countries in 2008 were Pakistan as the first most common country of birth of non UK-born women and India and Bangladesh as the third and fourth, respectively. These three countries were in the top three between 2001-2006 until 2007 when Poland became the third most common.

Polish migration to the UK presents an interesting case because the fertility of more traditional immigrants in the UK, such as those from Pakistan, India and Bangladesh, has typically been higher on average as they originate from high fertility societies. However, in the Polish case, fertility at origin is low with a TFR fluctuating from 1.2-1.4 births per woman in the period 1998-2008. Meanwhile, it has been thought that much of the migration from Poland and Other A8 countries has been primarily economically driven and consisting of mostly individuals who are single (Office for National Statistics, 2009f). This contrasts with the migration of individuals from countries, such as Pakistan, India and Bangladesh, where flows are often associated with family migration. However, given that Polish migration

[4]The countries known as the 'A8' group are: Czech Republic, Estonia, Hungary, Latvia, Lithuania, Poland, Slovakia and Slovenia.

to the UK is a relatively new phenomenon, in terms of the scale of the inflows since 2004, there is at present little quantitative evidence on the family formation patterns of this group, despite their large numbers within the UK. This is partially due to the fact that it is a recent phenomenon and also due to the difficulty in obtaining sufficient data to study such issues.

This research attempts to fill these gaps in the literature by analysing the relationships between migration[5] and family formation for recent migrants, and by examining differences between key groups. The first research question to be addressed is:

1. How do the partnership and family patterns of recent migrants to the UK compare with those of individuals with different migration trajectories, such as established migrants and non-migrants?

These analyses will focus on how the observed differences and similarities in the partnership and family patterns of these different groups further understanding of the relationship between migration and family formation in the life-course. The importance of life-course stage occupied at migration for subsequent family formation trends will be considered, with regards to whether entry to partnership and parenthood is delayed or accelerated for recent migrants in comparison to other groups. This research thus provides a basis for understanding how individuals negotiate their family careers across transnational space, as well as explaining the implications for the UK population.

Secondly, the family formation patterns of recent migrants to the UK are examined in more detail, with the second research question asking:

2. What are the partnership, family and fertility patterns of recent migrants to the UK and how do these compare amongst individuals from different migration systems?

It is of particular interest to investigate how the patterns of recent migrants from South Asian countries (Bangladesh, India and Pakistan), often associated with family formation migration to the UK, compare to those of young recent migrants from A8 countries, whose migration is thought to be primarily economically motivated. The analyses examine the extent to which migration is associated with family formation for young recent migrants from these two groupings and thus, what patterns underlie their high rankings amongst the most common countries of birth of foreign-born parents having live births in the UK.

[5]The focus is only on voluntary migrations here, as far as it is possible to determine that this is the case. Individuals who are forced into migration represent a different case that is beyond the scope of this research.

The research addresses the two substantive questions relating to family formation and its relationship with migration outlined above, but also asks a third research question relating to the paucity of detailed immigration data sources available in the UK:

3. To what extent is it possible to address the research questions outlined above with the data sources available in the UK?

The main contribution of the research is that it provides the first quantitative and detailed insights into the family formation patterns of recent migrants to the UK since 2001, and does so by separately analysing partnership, parent and fertility patterns. These insights are especially important in the case of the A8 migrant group, for whom little information is currently available. The findings therefore offer understanding of the ways in which various migrant groups may continue to contribute to the population structure of the UK and of the trends underlying current foreign-born fertility.

1.1 Structure of the thesis

The thesis begins in Chapter 2 with an overview of the main theories of migration, family formation and the relationship between the two processes. These theories are related to the UK context with regards to what patterns are currently observed and what one might expect to find, given the theory. In Chapter 3, available UK data sources for conducting the analyses are described, along with the rationale for choosing the UK Labour Force Survey. The sample used for the analyses and the variable definitions are also outlined in this chapter. In Chapter 4, logistic regression modelling, used to analyse partnership and parent status, is described. In Chapter 5, the analyses of partnership status, and the characteristics of migrants' partners are presented. The probability of being partnered is estimated for different groups of interest, whilst controlling for other characteristics. The analyses of partner characteristics provide insight into whether recent migrants are partnering with other migrants or UK-born individuals, and the timing of their partner's arrival to the UK in relation to their own, and therefore how closely migration and partnership are related. The analyses of parent status presented in Chapter 6 estimate the probability of being a parent amongst different groups, whilst controlling for demographic characteristics and partnership status. The importance of partnership types for parenthood probabilities is also explored, where applicable. In Chapter 7, the Own Child Methodology used to estimate the fertility patterns of recent migrant groups is described, before presenting the estimates obtained using

this methodology. These analyses indicate the level of fertility and allow the identification of the timing of births in relation to the timing of the migration event, offering further insight into whether family formation is closely associated with migration for different groups. Finally, the overall findings and main contributions of the research are discussed in Chapter 8, along with areas for further research.

Chapter 2

Migration and family formation

2.1 Introduction

This chapter provides an overview of the literature that covers both the processes of migration and family formation, as well as the relationships between them. Whilst many studies focus specifically on the family formation patterns of individuals who have migrated, it is important to firstly consider the processes of migration and family formation more generally. This is necessary to understand the wider contexts within which the relationships between migration and family formation might occur and to give consideration to how migrants may differ from the UK-born, within a life-course context.

An overview of theories on international migration is provided in Section 2.2. This is important to consider because international migrants are a *selected* group of individuals. Much attention has been paid across social science disciplines to both the factors that can contribute to making an international migration and to the characteristics of international migrants. This theory is important for understanding what the characteristics of recent immigrants to the UK might be and how they might differ from the UK-born population, and the implications of such for family formation patterns. The need to also account for the individual life-course is argued in Section 2.3 and accordingly, how the meaning and nature of migration can alter with progression through various life stages, emphasising the importance of not only historical but also individual time.

The determinants of fertility are described and discussed in Section 2.4. Reviewing fertility theory provides the contextual background for this research before focusing on what is known about these processes amongst migrants. In analysing the family formation patterns of migrants, it is necessary to compare the migrant group to the UK-born to identify to what extent observed patterns are related with the migration process and to what extent they are related to *selection* effects associated with migration[1]. In comparing the two groups, controls need to be made

[1]Any conclusions drawn with regards to the role of migration remain tentative since it is ac-

for known and observed determinants of family formation processes, such as differences in the age distribution of migrant and non-migrant groups.

Finally, the bodies of work that have specifically addressed the interrelationships between migration and family formation are discussed in Section 2.5.

2.2 Theories of migration

Much of the migration theory proposed across the social sciences has been conducted within different academic disciplines, with different questions and interests in mind. This has led to the emergence of different theories for explaining migration[2] that in some cases overlap, and in others focus on completely different aspects of the migration process, with no real clear consensus or theory of migration across disciplinary boundaries (Brettell and Hollifield, 2000; Massey, Arango, Hugo, Kouaouci, Pellegrino, and Taylor, 1993; Zolberg, 1989). The main theories are outlined here, whilst assessing their relative strengths and weaknesses for understanding the migration process, in the context of recent immigration to the UK.

The review in this section starts with theories that have largely originated from an economic perspective, before moving on to theories that have attempted to account for the non-economic aspects relating to migration. More recent attempts within the literature to bring many of the discussed theories together to provide a more holistic, interdisciplinary account of migration are then discussed. The overview finishes with the point made that migration related research needs to consider the multifaceted, complex nature of migration at the macro, meso and micro level for explaining the propensity to migrate at particular points in time.

Much of migration theory has originated from an economic perspective, with the underlying assumption that migration flows will be initiated for economic reasons (Castles and Miller, 2003; Massey et al., 1993). One of the earliest economic theories applied to study migration is the 'neo-classical perspective', which focuses on the individual as a rational actor seeking to maximise utility gain (Brettell and Hollifield, 2000; Mulder, 1993). From this perspective, migration is seen as a form of investment in an individual's human capital, whereby the individual decides to migrate when the economic returns to the migration are greater than any costs incurred in the migration process (Massey et al., 1993; Sjaastad, 1962). Thus, the

knowledged that differences might also exist due to *unobserved* heterogeneity amongst migrants and non-migrants, rather than as a result of the migration process itself.

[2] As discussed earlier, this research focuses on the migration theory largely relating to voluntary migration, with 'forced' migration representing a different type of migration that is beyond the scope of this research.

choice of where to migrate to will depend on the country which offers the best possible maximisation of economic returns for the particular individual (Borjas, 1989). Accordingly, some people choose to remain in the origin area because the perceived costs to migrating are greater than the perceived returns.

Given the neo-classical view of migration being based on a cost-benefit type analysis, Chiswick (2000) states that migrants are positively selected from the population at origin. Moreover, Chiswick argues that those individuals who have the greatest resources to invest in migration, are those with the greatest potential for labour market success and returns from migrating. For these positively selected individuals the perceived costs to migration are lessened, meaning that they stand to benefit more from making a migration than those who have less resources and for whom the costs of migrating will therefore be greater. Propositions such as these have led to notions of 'brain drain' (e.g. see Wächter, 2006; Kwok and Leland, 1982; Johnson, 1979) which refers to net loss of the most skilled and educated individuals at a particular origin, usually less developed. Chiswick (2000) acknowledges that individuals may have non-economic motivations for migration (e.g. family reunification), that are beyond the scope of the theory.

A strength of the neo-classical perspective is the simplistic notion of cost-benefit analysis, which undoubtedly reflects *some part* of the individual-level decision making process undertaken when considering to make a migration. However, the perspective has been critiqued for its assumption that individuals are rational, well informed decision makers who are able to assess all possible costs and returns that are associated with a given migration. Later extensions to the neo-classical model have attempted to address this issue by allowing for the role of uncertainty and incomplete information. The cost-benefit analysis typology provides a useful, general framework but the theory does not explain all of the factors that might be important in decision-making. It is likely that individuals consider a range of economic *and non-economic* factors when making a migration.

It is simplistic to consider all migrants as positively selected into migration. Chiswick's (2000) idea of positive selection makes an important point in the aspect that individuals will need to have certain resources in order to make a migration. However, this notion is likely to be context specific. In those scenarios where migration is relatively easy, migration may be a more accessible option for most individuals. For example, within the European Union (EU), individuals from EU member states are free to move to another EU member state, which paired with modern and cheap modes of transport and the ease of transnational communication mean that migration is a less costly exercise (physically and emotionally) than it was in the past.

The 'new economics of migration' theory (e.g. Taylor, 1999; Stark and Bloom, 1985) acts as a complement to the neo-classical perspective, with its emphasis placed on the role of the family and household unit, rather than simply the individual, within the decision making process. Stark and Bloom, Taylor and others in this field suggest that migration is used by families and households as a strategy to minimise risk by diversifying the location of 'resources' and point to the important role of remittances for the household or family that remains at origin as a driver for this decision. Indeed, the family or household members other than the migrant may invest in a migration in anticipation of the returns for the family or household. A wider array of economic related factors is considered to be important here than in the neo-classical perspective, in that it might not be a wage differential that drives the migration, but more generally the availability of *secure* employment and long-term investment in capital (Castles and Miller, 2003; Keeley, 2000; Massey et al., 1993).

The focus of the neo-classical perspective on the individual rational actor does consider the influence of wider level, macro factors but only does so from the viewpoint of the individual. There are arguably wider forces that act to limit or provide opportunities for migration, which may or may not be within the individual's consciousness. Castles and Miller (2003) suggest that by not specifically addressing wider level issues, the neo-classical perspective is unable to account for why migration flows are not simply characterised by individuals moving from the poorest to the most affluent areas. Likewise, the new economics of migration theory does not explicitly account for the importance of factors outside of the family or household unit level. These two perspectives fail to ground individuals and the units to which they are attached within wider structural opportunities and constraints.

In response to the limitations of microeconomic perspectives of migration, theories have emerged that attempt to account for the wider context within which migration decisions are made. One such theory is the 'dual labour market' theory (e.g. Piore, 1975 cited in Massey et al., 1993), which suggests that the labour market requirements of modern, industrialised countries are the key drivers of international migration (Castles and Miller, 2003; Keeley, 2000; Massey et al., 1993). The theory refers to the problem with 'structural inflation' (Massey et al., 1993), which occurs due to the fact that jobs within society are associated with different levels of social prestige and accordingly have a hierarchy of wages associated with them. If there is a greater demand, than there is supply, for workers to fill low-skilled positions, the problem exists that employers cannot simply raise wages to increase the attractiveness of the jobs, since other jobs would have to have their wages increased in order for the social hierarchy to be maintained. In light of this problem, employers look to foreign workers who are happy to fill the lower paid

occupations, since for these individuals the wages may still be relatively high in comparison to those available at the area of origin if its economy is not as well established as that of the destination country.

The dual labour market theory explains the need for migration from the country of destination perspective but less about *who* from the country of origin will migrate. Dual labour market theory also fails to explain the migration of individuals to work in occupations other than those that are low-skilled and associated with low prestige. To some extent, the theory is a product of its subject in that it has tended to focus on the economic migration of foreign workers from less developed countries to those that are more developed, and therefore offers less explanation for other types of migration.

Whilst dual labour market theory focuses on the role of the economy at national level, 'world systems theory' (e.g. Wallerstein, 1974 cited in Massey et al., 1993), or what has later become known as the 'historical-structural approach', focuses on the importance of the world economy in driving international migration. The key argument of this theory is that migration occurs within the unequal world economy, where powerful capitalist nations recruit cheap labour from less developed societies in order to both enhance their profits and growth, and therefore power, whilst sustaining the dependence of developed societies on these nations (Castles and Miller, 2003; Massey et al., 1993). As with the complementarity between the neo-classical and new economics of migration theories, the historical-structural approach fits well with dual systems theory; whilst dual systems theory focuses on the economic drivers of migration at the national level, the historical-structural approach highlights what the implications of such might be more globally in terms of the relations between different countries.

The limitations of the economic theories discussed here reflect to some extent wider tensions within the social sciences in the difficulties in establishing the balance between structure (macro-level factors) and agency (micro-level factors) in affecting behaviours and outcomes within society (for a review, see Giddens, 1984). Indeed, it is not true that the balance will be the same across situations, but that there will be some degree of interplay between the two. Individuals act within wider structural boundaries, whilst such structural boundaries are defined and reshaped by individual collective action. As such, these four theories of migration discussed thus far are partial in addressing either one or the other, but are not contradictory and taken together can provide a more holistic account of the decision making processes and different factors that influence migration at different societal levels.

A wider problem with the macroeconomic and microeconomic theories pre-

sented above is that they make the assumption that economic factors are the primary drivers of migration. Whilst this may be valid in some cases, it is unlikely that economic factors act in isolation of the non-economic factors that are almost entirely neglected in the theories above, and in other cases, economic factors may indeed play a less important role in the migration process. Network theories have stressed the importance of social factors in the migration process (e.g. Massey, 1990a,b; Boyd, 1989). Specifically, social networks of family members or friends in the area of destination are seen as facilitating the move of subsequent members of the family, neighbourhood or wider community. A social contact at the place of destination will be able to offer support with practical matters, as well as culturally and psychologically due to having already experienced the same process. The importance of social networks in facilitating the migration process may explain why one country of destination is preferred over another, when there may not necessarily be great differentials in the opportunities or conditions in two potential destination countries. With expanding migration networks, migration flows become increasingly diverse (Massey et al., 1993).

A related concept to network migration is that of 'cumulative causation' (Massey, 1990b), which refers to the increasing momentum of migration flows once they have been established due to the role of social networks, as described above. Cumulative causation also refers to the changing nature of the environmental, social and cultural contexts resulting from migrant inflows, which makes subsequent migration more likely (Keeley, 2000). The social network and cumulative causation aspects of the migration process help to explain why governmental policies that focus on economic factors are often unsuccessful in slowing immigration flows, with a dependence on economic theories of migration offering only partial insight into the processes at work (Castles and Miller, 2003; Massey, 1990a).

'Migration systems theory' (e.g. Kritz, Lim, and Zlotnik, 1992) attempts to bring together the different theories discussed above, as well as more general theories and factors relating to migration. In addition to this, migration systems theory recognises the importance of macro, meso and micro level factors both at origin and destination in the migration process. Migration systems theory attempts to synthesise the existing literature, which to some extent has been partial and fragmented, and to also account for the great complexity of migration. This is not to suggest that migration systems theory provides a grand narrative that is applicable to all migration. Rather, migration systems theory attempts to address the fact that many inter-related factors are important in the migration process.

Migration systems theory postulates that a 'system' exists where two or more countries are connected via migration between them. In studying migration flows,

it is necessary to study the conditions at both origin and destination with regards to institutional, political, cultural, social and economic factors, in order to fully appreciate all aspects of the linkages between the countries (Castles and Miller, 2003).

According to migration systems theory, any number of reasons may help to explain why certain migration flows exist, with no one reason likely to be sufficient in explaining migration. For example, in the case of the migration of individuals from India, Pakistan and Bangladesh to the UK, this can be linked to existing political ties with the British having had a colonial presence in these countries. Castles and Miller (2003) point to the importance of such an existing link between countries in the emergence of subsequent migration flows between the two, whether the ties are for economic, cultural or political reasons. In the case of Bangladeshis, Indians and Pakistanis migrating to the UK, economic and social explanations of migration alone would be ineffective in explaining why these individuals have chosen the UK in particular as a destination to migrate to.

2.2.1 Immigration to the UK

A systems theory approach provides a useful tool for considering recent immigration to the UK for the key groups of interest within this research. The key countries of interest are Bangladesh, Pakistan, India, and the A8 countries, which constitute a large proportion of the foreign-born population in the UK.

Firstly, many of the theories outlined above apply to the case of migration from Bangladesh, India and Pakistan. In the case of these South Asian countries, the colonial links with the UK meant that they were afforded special immigration rights until 1962, and this paired with a guest-worker recruitment programme in the period following the Second World War led to large-scale immigration flows from these countries (Charsley, Van Hear, Benson, and Storer-Church, 2012). This migration was primarily economic in character and followed by later family reunification and settlement. The large number of migrants from these groups who have settled in the UK means that there are now well-established networks and channels for future migration from these countries. Much migration from the Indian subcontinent is now often characterised by that associated with family formation (Charsley et al., 2012; Peach, 2006).

Secondly, for the A8 countries, the migration process can be seen to be in a much earlier stage, with large-scale immigration flows to the UK from 2004 onwards. A migration systems approach helps understanding of the large-scale flows seen *to the UK in particular* of A8 groups, due to the fact that the UK was one of the few EU

states who granted full participation into their labour markets for individuals from these countries following their accession to the EU (McCollum and Findlay, 2011). This migration is thought to be characterised by the earlier economically motivated migration when flows are first established. Whilst there are social networks to facilitate subsequent migration, these will be made up of other recent migrants, in contrast to the South Asian case, where many of the second generation are now in adulthood.

From the theories discussed in the previous section, it might be expected that migration will be more closely associated with family formation for the South Asian groups than for the A8 group, whose migration is less well-established and therefore likely to be associated with more highly selected flows and less diversity in migration experiences. This idea is explored in this thesis when comparing the family patterns of these groups.

2.3 Migration and the life-course

As Mulder (1993) suggests, the field of demography provides useful concepts and tools for the analysis of the complexities of the migration process. For example, Mulder refers to the general difficulty in relating macro and micro level factors within research and in disentangling the role that each of these factors may play. One way to assess the importance of macro level factors is to consider either temporal or geographical variations in the research outcomes of interest. In doing so, one is considering the behaviour of individuals across either different time periods or different geographical locations, with any observed differences providing possible indication of the importance of the wider environmental context in affecting these behaviours. Within the field of demography, the importance of the particular historical time period in which demographic events occur is referred to as a 'period' effect (Mulder, 1993). For example, in each historical period, particular social, economic, cultural and political conditions exist, with associated normative conventions for behaviours.

In order to ascertain whether observed differences across temporal or spatial variations are really due to macro-level influences, we also need to consider whether micro-level differences between individuals may be attributable for any observed variations. In particular, it is known that demographic events, such as migration, union formation and childbearing, are strongly related to age and progression through the individual life-course. Before discussing the implications of this for the current research, it is firstly useful to introduce the concept of the 'life-course'

in more detail.

The life-course concept employed here originated in its current formulation in the work of Glen H. Elder Jr and colleagues, writing from the 1960s onwards (e.g. Elder Jr, Johnson, and Crosnoe, 2003; Elder Jr, 1995, 1994, 1975). Within many social science disciplines, the life-course has become a research paradigm for studying social processes, with the life-course itself conceptualised as the way in which an individual progresses through their life via parallel careers and key transitions and events that can each lead to the embodiment of different life stages, each of which can have different meanings and connotations. For example, a career within the life-course of interest for this research is an individual's migration career, whereby an example of a key event or transition from one stage to another would be making an international migration for the first time, moving from occupying the state of being a 'non-migrant' at origin to that of a 'migrant' in the country of destination.

As Kulu and Milewski (2007) suggest, whilst the focus of the life-course perspective might be on the progression of individuals through their life-course, the aim of such an approach is to ultimately understand social processes and trends; observing the life-course trajectories of individuals with different sets of characteristics, evaluating the importance of those characteristics for different trajectories. The life-course perspective views individual agency as operating in relation to that of other individuals, as well as being grounded within wider social constraints and opportunities[3]. It is acknowledged that the life-course has become more individualised and fluid in the latter half of the twentieth century(Brückner and Mayer, 2005). Nonetheless, in industrialised, developed societies, such as the UK, where society is to some extent age-structured, there are still norms surrounding the timing of different events within the life-course (Mulder, 1993). This relates to the 'cohort' concept within demographic research, which defines a group of individuals who are of the same age within the same historical period, who progress through the life-course together and often experience similar timing of life events and transitions.

The timing of events in one career can be mediated by those of other parallel life-course careers. For example, Section 2.4 discusses how the timing of first births within the childbearing career can vary according to the state occupied in the education career. This is a key feature of the life-course approach in attempting to understand how the interplay of different careers leads to certain outcomes. As with the systems theory of migration, the life-course perspective suggests that many factors are inter-related in bringing about particular outcomes. However, the

[3]The concept of the life-course used here is intended to break from earlier more deterministic conceptions of the individual 'life-cycle', which refers to a more fixed set of life-stages that are pre-determined (Mulder, 1993).

key contribution of the life-course perspective is in highlighting the importance of individual time in the occurrence of certain life events, and in particular here, for the propensity to migrate. Much research has sought to locate migration within a life-course perspective (for examples of earlier and more recent developments respectively, see Courgeau, 1985; Kulu and Milewski, 2007). In this research, the focus is on the relationships between the migration and family formation careers within the life-course for recent migrants to the UK.

In Clara Mulder's studies of migration dynamics across the life-course (a collection of which are found in Mulder, 1993), she suggests that individuals do not constantly consider whether or not to migrate, but instead that the migration decision will be triggered by some life-course event or in relation to such. Thus, migration is considered not as an ends in itself but as an 'instrumental behaviour' (Willekens, 1987) allowing the attainment of desired outcomes. The 'triggering' event(s) responsible for the migration will strongly determine the characteristics of the individuals who are selected in to migration and accordingly, the family patterns we might expect to see. For example, individuals may choose to migrate to pursue higher education, in which case we would expect childbearing following migration to be less likely since this may not be feasible whilst studying. By contrast, if an individual chooses to migrate to be reunited with a partner or to form a partnership, the migration is much more closely related with family formation[4].

Willekens also discusses the notion of 'state dependence' in relation to migration, referring to the current life-stage occupied. For example, commitments to remaining in the current location may be stronger whilst occupying some states than in others, depending on the security of one's career, whether they own their residence and whether or not they have a family. This notion has been supported by the common finding across studies that individuals are increasingly less likely to migrate, the longer they have been in the current location (e.g. Courgeau, 1985; Sandefur and Scott, 1981; Morrison, 1971), which is likely due to greater settlement and investment in life in the area (Mulder, 1993). This supports the earlier critique of Chiswick's (2000) notion of migrants always being positively selected, since those individuals with greater skills may have better returns or economic prospects than low-skilled individuals in the area of origin, meaning that the state dependence of the higher-skilled individuals in their occupations may be greater.

In this research, it might be expected that state dependence is greater amongst

[4]This refers to the initial intentions and motivations for migration. Naturally, with time since migration, different behaviours may become more likely as migration is a dynamic process. For example, whilst individuals may migrate for educational purposes, they may decide to stay in the destination country after completing education and therefore, family formation behaviours may become more likely.

individuals who have already established partnerships and families, than amongst single individuals. Individuals with established families may be less likely to migrate since it would also involve re-locating or being separated from other family members.

Since migration is strongly related to other careers within the life-course, it is not surprising to find that age plays an important role (Mulder, 1993). Migration is generally found to be most common amongst young adults, who have less constraints or responsibilities. However, some studies also document an increase in migration propensities at retirement ages also (King, Warnes, and Williams, 1998), once individuals are no longer tied to an occupation and may therefore migrate to deal with the life-course transitions encountered at these older ages (Evandrou, Falkingham, and Green, 2010). Thus, both individual age and, in relation to this, current life-course stage affect the propensity to migrate and the nature of the migration undertaken (Mulder, 1993).

2.4 Theories of fertility

In this section, the main theories that have been proposed across social science disciplines to characterise determinants of fertility are reviewed. The most basic simplification of the study of fertility is that it focuses on the number of children born to females. Hence, a large part of the fertility process is biological in nature. Within demography, the biological capability to reproduce is referred to as fecundity, whilst the concept of fertility is usually reserved for the *actual* bearing of children, rather than merely the ability to reproduce. The importance of social factors in mediating *fertility* outcomes is the focus of interest within this research.

The study of the demographic transition, the process whereby countries move from high mortality and fertility scenarios to lower mortality, followed by lower fertility resulting in ageing populations (Lee, 2003), has led to a number of works seeking to explain the various components of this process. Here, the interest is in the fertility transition and in reviewing the theories that have been proposed to explain this, drawing on an overview provided by Weeks (2005), in order to gain a better understanding of wider explanations of the social determinants of fertility.

Theories aimed at explaining the shift to lower fertility levels in transitional societies stem from the two major schools of thought placing importance on either the economics of fertility or the cultural diffusion of ideas (Weeks, 2005). The discussion will start here with those grounded in the economic discipline before moving on to the cultural approaches. The 'supply-demand' framework, as pro-

posed originally in the work of Easterlin (1975), suggests that individuals work to balance the available supply of children with their own demands for childbearing. According to this theory, fertility was high in pre-transitional societies as a means of providing the desired demand for children in the context of high infant and child mortality. Therefore, couples' fertility was high in order to produce the desired number of *surviving* children. Since in this context, supply would meet demand, there was little need for control over fertility. However, in the context of declining mortality levels and therefore increasing numbers of *surviving* children, the supply of children might exceed the demand, with some form of fertility control now needed, depending on the perceived costs of implementation (Easterlin, 1975).

The supply-demand theory is grounded within neo-classical economics, with the rational actor(s) responsible for declines in fertility, due to a cost-benefit analysis of the desired number of children and the subsequent alteration of behaviours in order to achieve that fertility. This theory fits well in the 'new household economics' approach (earlier discussed with reference to migration theory in Section 2.2), since the fertility decision is considered to be made at the couple or household level.

The economic concept of 'opportunity costs' offers insight into why having fewer children may be preferred. It is argued that with modernisation and industrialisation, gender equity has increased with more opportunities available for women in terms of education and labour force participation than previously available, as the means of production have changed (Brewster and Rindfuss, 2000). Thus, with the increase in opportunities for women other than those offered in the childbearing career, the costs of childbearing become greater, requiring greater sacrifices to be made. Women may therefore lower their demand for fertility in order to pursue other opportunities. This would suggest that not only does supply potentially alter with the socio-economic changes resulting from modernisation, but so too does demand.

It should be acknowledged that under a neo-classical model of behaviour, we also need to consider the perceived benefits to childbearing (Weeks, 2005). However, these are hypothesised to have also altered with the economic growth of society since children may bring less economic benefits for their parents than in more traditional societies. In premodern societies, children provided a form of human capital that would yield economic returns for their parents via income and security, particularly amongst those living in rural, agricultural areas (e.g. Cain, 1981). However, in more advanced economies, children provide far less economic returns for their parents, with greater time and resources needed to be invested in children

by their parents.

The notion of children as commodities, requiring investment, was introduced by the work of Gary Becker (e.g. Becker, 1991; Becker, Murphy, and Tamura, 1990; Becker and Barro, 1988; Becker, Duesenberry, and Okun, 1960). According to this theory, each individual will have a utility function, which is an expression of their desire to have children in relation to other life goals, given the perceived costs and benefits of each. Continuing on the theme of investment for returns, Becker's work also claims that there is a balance that needs to be established between the quantity and quality of children. In traditional societies, where children provide income and security, quantity may have been more favourable, whilst in modernised societies where children require greater investment of resources in their human capital, more attention may be focused on quality. This would help to explain a shift from a preference for higher to lower fertility levels.

The notions of quantity versus quality and opportunity costs have also been proposed to explain fertility differentials *within* societies. It is suggested that individuals in higher social strata choose to invest in the quality of their children and therefore limit their fertility in order that sufficient resources can be invested in each child. Meanwhile, it is implied that this is less the case for individuals in lower social strata, who will be likely to have a greater quantity of children. Likewise, the opportunity costs to childbearing are perceived to be greater for women who have higher levels of human capital (Weeks, 2005).

The micro-economic perspectives reviewed above highlight the importance of accounting for level of education, employment status and socio-economic status in the analysis of fertility. Indeed, in fertility research high levels of socio-economic status and level of education, along with employment status have almost universally been found to be inversely related with fertility levels (e.g. Weeks, 2005; Brewster and Rindfuss, 2000; Caldwell, 1980). However, as with the micro-economic perspectives of migration, these theories are criticised for focusing on the socio-economic aspects of fertility decline, without enough attention paid to cultural factors (Weeks, 2005). For example, religion, the extent of gender equity and cultural norms within a given society may all affect the ability of females to participate in the economic sphere.

The 'diffusion of innovations' theory (e.g. Rogers, 1962) has been proposed to explain the spread of ideas and trends within society, and is thought to be, at least partially, accountable for the cultural shift from high to low fertility norms (Bongaarts and Watkins, 1996). It is thought that the diffusion of innovations had played an important role in the early fertility declines because the patterns spread geographically across Europe, despite the fact that the levels of mortality and eco-

nomic growth varied somewhat between European countries at the time (Watkins, 1991 cited in Weeks, 2005).

Some societies are more susceptible to the diffusion of innovations than others (Pollack and Watkins, 1993), depending on the extent to which individuals are 'empowered' to control their own fertility behaviours (Weeks, 2005). For individuals who live in societies with lower levels of gender equity and, or, where religion plays an important role in their lives (e.g. Frejka and Westoff, 2008), they may feel less freedom to control their own fertility due to the presence of strong social and cultural norms about appropriate fertility behaviours and the role of women in society.

It is also important to acknowledge the role that public policies may play in influencing fertility behaviours within each society (Gauthier, 2007). For example, public policies towards female employment and the family may affect to what extent it is feasible for women to pursue both their employment and childbearing careers at the same time (Brewster and Rindfuss, 2000). These theories stress the importance of considering factors such as religion and ethnicity, which may help us to understand the beliefs and practices of certain individuals, as well as the wider institutional contextual factors, such as public policies towards childbearing.

The fertility theories outlined above refer to the fertility transition from a high to low fertility society and thus are largely concerned with the decrease in fertility *quantum*.[5] However, for post-transitional societies, such as the UK and within wider Europe, the *tempo* of fertility and the interaction between tempo and quantum are particularly important for understanding the very low fertility levels witnessed over the past couple of decades.

Particularly low fertility emerged in Southern, Central and Eastern European countries during the 1990s (Sobotka, 2004), which led to the term 'lowest-low'[6] fertility being adopted (Kohler, Billari, and Ortega, 2002). Sobotka (2004) shows that by 2000, 20 European countries, representing approximately 72% of Europe's population, had recorded TFRs of 1.4 or below. The fertility seen in Northern and Western Europe during the same period was comparatively high, with it not decreasing to 'lowest-low' fertility levels but remaining below replacement level, with the UK reaching a low TFR of 1.63 in 2001.

The low and lowest-low fertility levels seen in Europe over the past couple of decades have caused much concern due to the imbalance between larger older de-

[5]The quantum of fertility refers to the *number* of children a woman has, whilst the *tempo* of fertility refers to the timing of childbearing, such as when a woman has her first child and the time elapsed between births.

[6]The term lowest-low fertility refers to an arbitrarily chosen value for countries with Total Fertility Rates of 1.3 or below, taken to indicate very low fertility levels.

pendent cohorts and smaller cohorts at working-ages, and more generally because continued sub-replacement fertility in a stable population would lead to population decline (Frejka and Sobotka, 2008). One proposed 'solution' by the United Nations was that of 'replacement migration', whereby the young age structure of immigrants and their childbearing could help to ease the problems of ageing populations and low fertility (United Nations, 2000). Such notions were largely rejected due to the scale of immigration needed for such a solution to work (Coleman, 2002), but the suggestion does serve to highlight the important ways in which immigration can contribute to population growth, as has been seen in the current UK context, and is the interest of this thesis.

Much debate has also focused on whether lowest-low and low fertility reflects actual reduction of fertility quantum, or whether cohort fertility will be higher than observed period fertility due to a transitional period of postponement followed by later recuperation at older ages. The postponement idea has been suggested because of the almost universal increase in age at first birth across European post-transitional societies (e.g Sobotka, 2004; Frejka and Sobotka, 2008), which has been accompanied by a number of wider changes in living arrangements and behaviours, that are grouped together under the umbrella term of 'Second Demographic Transition' theory (SDT), proposed by Lesthaege (1995) and van de Kaa (1987). These behaviours, which have been witnessed across Europe, include: older ages at leaving the parental home, increased cohabitation, later ages at marriage for those who do marry, increasing proportions of births occurring outside of marriage, increased prevalence of divorce, increased single parenthood, increased childlessness and greater variation of family forms (for examples, see Stone, Berrington, and Falkingham, 2011; Sobotka, 2008; Berrington, 2004).

The SDT refers to the cultural shift in norms (linked to the diffusion of innovations theory discussed above) and practices towards individualisation, the pursuit of self-fulfilment and secularisation, and underlying structural changes, such as the expansion of higher education and modernisation (Sobotka, 2008). Within these settings, it has become more normative for females to pursue higher education and high income careers, which have been shown to be associated with later entry to parenthood in the UK and wider Europe (Berrington, 2004; Rendall and Smallwood, 2003). In the Southern European case, lowest-low fertility has been associated with high youth unemployment and thus, greater incentives to remain in higher education and in the parental home. Whilst in the Central and Eastern European case, the collapse of the former Soviet Union and associated transitions to market economies meant that there were potentially greater returns to human capital, providing greater incentives for the pursuit of higher education and careers, than there had been previously (Kohler et al., 2002).

As Sobotka (2008) argues, it might be too simplistic to simply equate the behaviours characterised by SDT theory with lower fertility, but rather it might be that delayed fertility is a result of these changing norms and behaviours. Under a 'perfect' postponement-recuperation scenario, the lowest-low and low European fertility is indicative of purely a tempo effect, whereby the childbearing of these cohorts is simply shifted to later ages, but overall quantum remains the same (Kohler et al., 2002). Alternatively, it may be that there is a postponement-quantum interaction, whereby individuals postpone childbearing in anticipation of later recuperation but do not fully realise those fertility intentions due to 'perpetual-postponement' (e.g. Berrington, 2004; Kohler et al., 2002) until biological ageing acts as a barrier to childbearing. It could also be that fertility intentions are altered with progression in the childbearing career in line with other life-course careers (e.g. Berrington, 2004; Monnier, 1989) or that the low fertility is indicative of lower fertility preferences, but less weight has been given to the last argument.

It is important to briefly note here a key difficulty in addressing the postponement-recuperation question, which helps to explain why there has been much debate around these issues. It is believed that the lowest-low and low fertility observed may be lower than eventual cohort fertility due to tempo effects, which means that the low fertility levels recently observed are due to the use of the period TFR as an indicator of fertility. The TFR is based on a synthetic cohort of females, based on current childbearing levels and will therefore be affected by shifts in the timing of childbearing amongst different cohorts. Given this, there has been a whole literature focused on the appropriateness of the TFR for measuring fertility, but the TFR remains a useful, widely accepted, tool for comparing fertility levels between groups, in the absence of more detailed data (for discussion see Ní Bhrolcháin, 2011; Bongaarts and Feeney, 2000, 1998). This is also particularly relevant for this research because of the impact immigrant fertility may have on the TFR, due to tempo fertility effects caused by migration timing (as explained further in Section 2.5 below).

Despite the difficulties in measuring whether postponement is occurring, evidence has recently emerged which provides support for postponement-recuperation, with increases in the fertility of lowest-low and low fertility countries towards the end of the last decade. Goldstein, Sobotka, and Jasilioniene (2009) attribute this to recuperation and suggest that lowest-low fertility was mainly attributable to postponement, rather than to a postponement-quantum interaction. Most of the lowest-low fertility countries now have TFRs higher than 1.3 but their TFRs are still below replacement level, leading Goldstein et al. (2009) to suggest that there is a reduction in the pace of postponement but that the phenomenon has not yet ended. Nonetheless, this is still an emerging and complex phenomenon, with the

uncertain economic climate in Europe potentially stalling recent increases (Goldstein et al., 2009) and immigration also partially attributable for increasing fertility (Tromans, Jefferies, and Natamba, 2009; Goldstein et al., 2009). As discussed in Chapter 1, in the UK case recent rises in fertility are attributable to the fertility of UK-born and foreign-born women.

The review of theories of fertility considered in this section has been instrumental in highlighting key social determinants of fertility. For example, the importance of level of education, employment status, socio-economic status, religion, ethnicity and the interplay between tempo and quantum effects at the micro-level, in addition to public policies and cultural norms and practices at the macro-level have all been stressed.

For this research, the importance of selection into migration, in terms of life-course stage and the motivation for migration, is evident. If individuals are positively selected in to migration as economic migrants, we might expect to observe low fertility levels amongst this group given their higher human capital and the opportunity costs associated with their childbearing. By contrast, if individuals migrate for reasons relating to family formation, we might expect to observe high fertility levels. This again leads to the notion that the family formation and migration experiences of the South Asian and A8 recent migrant groups may be quite different.

2.4.1 UK fertility

Fertility in the UK began to decline around 1875, and the UK is now at the stage where both fertility and mortality are low, and it is experiencing an ageing population. For the past three decades, fertility in the UK has been relatively stable and low (Sigle-Rushton, 2008). A low TFR of 1.63 was recorded in 2001, but since then the TFR has been increasing, with fertility now approaching 'replacement' level (2.1) with a recorded TFR of 2.0[7] for 2010 (Office for National Statistics, 2011).

As Sigle-Rushton (2008) states, whilst fertility has been relatively stable within the UK over the past three decades, there are important variations between groups in line with those described above. Important differentials in fertility patterns have been shown for educational groups (e.g. Rendall, Couet, Lappegard, Robert-Bobée, Rønsen, and Smallwood, 2005), occupational groups (see Sigle-Rushton, 2008, for discussion) and amongst ethnic groups (e.g. Coleman and Dubuc, 2010), which fit with the theories outlined in the previous section.

[7]Note that this TFR is for England and Wales but the picture of increasing fertility, and TFR, is very similar for the UK.

2.5 Relationship between migration and fertility

Within the social sciences, there has been long standing interest in the study of the relationships that exist between migration and fertility. A result of this has been the emergence of key hypotheses proposed to explain these relationships, which can be used as a guiding framework for the analyses of migrant fertility, and also migrant family formation patterns, within this thesis. A summary of the key features of each of the hypotheses discussed here is shown in Table 2.1.

The socialisation hypothesis ultimately views childhood environment as the main factor for shaping fertility outcomes in later life (Kulu, 2005). Under this hypothesis, the change in environment incurred due to migration is not considered to alter fertility behaviours. As such, the fertility patterns displayed by migrants would be expected to most closely resemble those of non-migrants at place of origin, rather than those of non-migrants at place of destination. This hypothesis also means that differential fertility patterns would be observed between migrants in the same destination area, if they had originated from areas with different fertility patterns to one another (Milewski, 2007).

The adaptation hypothesis provides a very different perspective to the socialisation hypothesis in placing emphasis on conditions in the destination area. The adaptation hypothesis has sometimes been confused for the process of assimilation but more recent studies have clarified this issue (e.g. Andersson and Scott, 2007; Andersson, 2004). For example, both the processes of adaptation and assimilation would suggest that migrant fertility trends will most closely resemble those of non-migrants at destination. However, the underlying explanations for why this is the case differ between the two hypotheses.

The idea behind adaptation is that migrants will have to adapt to the social, political and economic conditions they are subject to in the new location (e.g. Schmid and Kohls, 2009; Lindstrom and Saucedo, 2007; Milewski, 2007), meaning that fertility is altered on account of practical rather than ideological reasons. Thus, the recognition of the importance of current context in shaping fertility behaviours suggests that those who share the same context will also share similar fertility patterns.

By contrast, assimilation refers to a process of acculturation (Andersson, 2004), whereby migrants come to adopt the cultural norms at destination and therefore fertility patterns will be the same due to ideological reasons. However, depending on the age at migration and the extent of the cultural normative differences between destination and origin, it might be that assimilation will only be visible f-

Table 2.1: A summary of proposed hypotheses to explain the relationship between migration and fertility

Hypothesis	Effect of migration	Main influence on fertility outcomes	Mechanism	Expected patterns in migrant fertility	Visibility of effect after migration	Duration of effect
1. Socialisation	None	Place of origin; Childhood environment	Fertility preferences mainly shaped by those present in childhood social environment	Similar to non-migrant fertility at *origin*	Immediate	Permanent; Should be visible amongst all migrants regardless of duration of residence
2. Adaptation	Indirect - causes the change in environment	Place of destination	Socioeconomic, political factors will affect ease of childbearing	Similar to non-migrant fertility at *destination*	Immediate	Long-term (provided one remains in destination environment); Should be visible amongst all migrants regardless of duration of residence
3. Assimilation	Indirect - causes the change in environment	Place of destination	Adoption of cultural norms and behaviours of destination after long period of time	Similar to non-migrant fertility at *destination*	Gradual - Increases with duration of residence	Long-term (provided one remains in destination environment)
4. Selection	None- occurs as a result of fertility preferences	Migrant characteristics	Individuals migrate to most suitable areas for their fertility preferences	Similar to non-migrant fertility at *destination*	Immediate	Permanent (fertility preferences always precede migration decisions); Should be visible amongst all migrants regardless of duration of residence
5. Disruption	Direct	Migration	Migration *process* causes disruption to childbearing before and after the move	Lowered fertility prior to move; Fertility either lowered due to continued disruption or elevated due to 'catch-up' effect after the move	For some immediate; For others could take between 1-2 years in order to analyse births that have very closely followed the migration	Short-term; Should be visible for recent migrants but not migrants who arrived a long time ago
6. Interrelation of events	None- occurs as part of joint decision making process on several life events	Not specified	Migration, union formation and childbearing closely linked and occur within short period of time; Interconnected processes - rather than consecutive events	Fertility and migration occur very closely within time	For some immediate; For others could take between 1-2 years in order to analyse births that have very closely followed the migration	Short-term; Should be visible for recent migrants but not migrants who arrived a long time ago

or second generation migrants (Schmid and Kohls, 2009; Andersson, 2004).

Adaptation is, therefore, a process that will occur immediately after arrival, whereas assimilation is a gradual process, which will increase with duration of residence (Schmid and Kohls, 2009; Lindstrom and Saucedo, 2007; Andersson, 2004).

Whilst the ideas of socialisation, adaptation and assimilation place emphases on social environment in affecting fertility outcomes, the selection hypothesis suggests the importance of the characteristics of migrants (Schmid and Kohls, 2009). The selection hypothesis, in line with the wider migration literature, points to the fact that individuals who migrate are a sub-group of the whole population and therefore have been selected in to the process of migration. As Milewski (2007) suggests, migrants may be selected in terms of observable demographic and socio-economic characteristics, or in terms of unobservable characteristics, such as the desire to pursue a career or indeed fertility preferences.

With regards to migrant fertility, the selection hypothesis implies that similar patterns of migrant and non-migrant fertility at destination are not due to processes of adaptation or assimilation but rather due to migrants moving to locations which are more compatible with their own fertility preferences. In some scenarios, the relationship is considered to be fairly direct with fertility preferences as the main reason for migration (Lindstrom and Saucedo, 2007). An indirect relationship has been proposed by the mobility hypothesis, whereby individuals migrate for career or educational purposes to improve their own socio-economic position (Lindstrom and Saucedo, 2007). The driving forces of the migration are not fertility preferences *per se* but pursuit of further education or career goals are often associated with delays in childbearing (Schmid and Kohls, 2009; Bledsoe, Houle, and Sow, 2007).

The main idea behind the selection hypothesis, of which the mobility hypothesis is considered a sub-hypothesis, is that individual characteristics are attributable for migrant fertility trends. Fertility outcomes are therefore considered as uninfluenced by the change in environment and as predetermined prior to the move. The act of migration does not directly affect fertility outcomes, but facilitates the attainment of fertility preferences.

All four of the hypotheses outlined above propose long lasting relationships and effects between migration and fertility. By contrast, the disruption hypothesis focuses on the short-term effects of the actual process of migration (Schmid and Kohls, 2009). The main premise of this hypothesis is that fertility will be disrupted in the periods before and after a migration is made, with a predominant focus on effects on the tempo of fertility. The disruption hypothesis provides little explana-

tion of whether, and how, fertility quantum will be affected by migration.

The literature has generally suggested that fertility would be lowered during the periods prior to and after a migration (e.g. Schmid and Kohls, 2009; Kulu and Milewski, 2007). Proposed explanations for fertility decreases are stress, and anticipation of the move, prior to the migration (Milewski, 2007) and the need to settle in to a new environment or due to partner separation following the migration (Lindstrom and Saucedo, 2007; Milewski, 2007). However, some studies have also suggested that the disruption effect could result in heightened fertility after migration due to a recuperation effect occurring as a result of postponed fertility prior to the move (e.g. Bledsoe et al., 2007; Milewski, 2007; Andersson, 2004). In this sense, the disruptive effect would be considered strongest before the migration is made.

The notion of elevated fertility following a migration is not only characteristic of the disruption hypothesis, but also of the interrelation of events hypothesis. This hypothesis proposes that elevated fertility following migration is due to the interconnectedness of events (e.g. Schmid and Kohls, 2009; Andersson, 2004). For example, rather than viewing events, such as migration and childbearing, as occurring consecutively in time and as causing one another, they are viewed as jointly determined and interrelated. This is hypothesised to especially be the case where migration, union formation and first births occur very closely in time. Migration might facilitate union formation, or union formation might create the need to migrate to live together and these events may in turn allow the process of childbearing. Furthermore, this type of association is expected to be especially common where short distance moves have been made, likely reflecting the need to simply change household to accommodate changes in family composition.

The interrelation of events hypothesis is also similar to the disruption hypothesis in the sense that it indicates the short-term patterns of fertility that might be observed, but does not discuss expected long-term patterns in migrant fertility. For example, it is unknown whether there will be fertility differentials for individuals for whom migration was associated with childbearing in comparison to individuals whose fertility trajectories did not include a migration. A further hypothesis worth mentioning here is the legitimacy hypothesis, which is a relatively new and under-researched hypothesis within the field (Bledsoe et al., 2007; Milewski, 2007). The notion behind the legitimacy hypothesis is that individuals who are making international moves may postpone childbearing until after they have arrived in the receiving country in order to gain citizenship rights for their children and in order to access other possible entitlements. If this is the case, then elevated fertility levels would be expected soon after arrival at destination. Whilst most of the hypotheses

discussed above have been in very abstract form, this hypothesis clearly depends very much on the legal issues in the specific contexts involved, as not all countries afford citizenship to foreign-born children for example (Milewski, 2007).

The existing literature that has attempted to research the relationship between migration and fertility can be classified in to two broad groups. The first of these relates largely to the early studies on migrant fertility (e.g. Lee and Farber, 1984; Goldstein and Goldstein, 1981; Zárate and Zárate, 1975), which were conducted mainly within the context of the first demographic transition in developing societies, where the process of rapid urbanisation and rural-urban internal migration lead to fears about acceleration of already growing populations. Migrant fertility was considered important within this context because the individuals migrating from rural to urban areas had characteristically higher fertility than that found amongst individuals in urban areas. Thus, there were concerns regarding whether such high fertility would be sustained and exacerbate the perceived problem of rapid population growth, or whether the fertility behaviours of individuals would alter in accordance with those displayed in the urban areas. For example, Goldstein and Goldstein (1981) studied the fertility of rural-urban internal migrants in Thailand in the 1970s, comparing migrant and non-migrant fertility estimates across different areas, using the Own Children Method to derive the fertility estimates. They concluded that their results could provide support for both the selectivity and disruption hypotheses because migrant fertility did not reach that of non-migrants at origin, but a recuperation effect of elevated fertility did appear after arrival at destination. Meanwhile, Lee and Farber (1984) found support for the adaptation hypothesis in their study of Korean rural-urban fertility, due to the lower fertility found amongst rural-urban migrants in comparison to rural non-migrants. Such studies were also conducted within the American context where there were also concerns over rapid urbanisation (see Zárate and Zárate, 1975, for a review).

The second body of literature relates to more recent studies, which have been interested in migrant fertility in the context of post-transitional societies where ageing populations and low fertility scenarios, such as that found in the UK, have lead to migrant fertility being viewed in a more positive light in helping to increase the youthfulness of populations. These two bodies of research are distinct not only in terms of the motivations for the research on migrant fertility patterns, but also in terms of the data sources and methodologies used to investigate the problem. Within developing societies, there is not always detailed data available for studying the research questions, with research attempting to maximise the potential of the available data. Whilst more recently, research conducted within developed contexts has exploited the availability of detailed, longitudinal data sources and

more sophisticated methodologies. Indeed, the new wave of literature on migrant fertility has suggested that inconsistencies between studies is likely to be due to a dependence on cross-sectional data and associated analyses (e.g. see the special collection by Kulu and Milewski, 2007). It is argued that in order to fully address proposed hypotheses on migrant fertility, some of which are long-term in nature, longitudinal analyses situated within a life-course perspective are required. Such research has turned to event history analyses to observe fertility outcomes over time, following arrival to the destination country, and taking in to account characteristics at arrival. Analyses have also been extended further using multi-process models to account for unobserved heterogeneity between individuals, in an attempt to address the selectivity hypothesis (e.g Kulu, 2006).

The recent developments within the migrant fertility literature are helpful in furthering understanding of the different hypotheses proposed to explain migrant fertility. However, in those countries where detailed information is not available, the analyses that can be conducted are still very informative with regards to migrant fertility patterns. This is the case for the UK, where detailed information on migration and fertility histories are not available together in a dataset that offers sufficient sample sizes to allow detailed longitudinal studies of migrant fertility with sophisticated methodologies (as discussed in more detail in Chapter 3).

2.5.1 Immigrant fertility in the UK

Whilst there has been much interest in the fertility of different ethnic groups within the UK, there has been less attention paid recently to analyses by country of birth. Tromans et al. (2009) analyse the fertility of the foreign-born population in comparison to the UK-born population to assess the extent to which increases in recent UK fertility are attributable to immigrant women. They find that foreign-born women are responsible for 39%, 88% and 100% of the increases in fertility at ages 20-24, 25-29 and 30-34 years, respectively. This is paired with the fact that Poland now features as the second most common country of birth for foreign-born mothers having live births in the UK in 2008, with Pakistani, Bangladeshi and Indian mothers also featuring highly on this list. Thus, there is a need for analyses of the fertility of Polish females in comparison to those of the South Asian groups. Typically, the fertility of these South Asian groups is found to be higher than the UK average, when providing estimates by ethnicity (Coleman and Dubuc, 2010), although the difference is not so pronounced for Indian females. For Polish females, however, given the low fertility at origin, it is particularly interesting to consider whether the large number of live births is purely due to the size of the Polish population in

the UK or whether they are experiencing higher fertility in the UK than that found at origin. This can be explored by calculating fertility rates.

Due to the focus on recent migrant groups, short-term hypotheses of migrant fertility will be focused on within this research. The hypotheses considered are the 'disruption' (hypothesis 5) and 'interrelation of events' (hypothesis 6) hypotheses outlined in Table 2.1, which focus on the relationship between the *timing of the migration event* and fertility. Whilst these hypotheses have been proposed within the framework of migration and fertility, they will also be considered more generally with regards to partnership patterns and family formation for the recent migrant groups.

2.6 Summary

The theories of migration, fertility, and the relationships between the two, outlined in this chapter provide useful tools for the analyses conducted in this thesis, for comparisons of the family formation patterns of recent migrant groups to the UK. The migration theory suggests that we should expect to see quite different patterns for the South Asian and A8 groups, given the different nature of the immigration flows and experience of these groups to the UK. Fertility theory suggests other important factors, such as education, to both control for and explore the importance of when comparing the experience of different migrant groups and the experience of recent migrants against that of the UK-born population. Meanwhile, there are some emerging findings on the fertility of migrant groups within the UK, but further analyses are needed for recent migrants, using short-term hypotheses of migrant fertility to consider how A8 and South Asian females compare.

Chapter 3

Data

3.1 Comparison of UK data sources

In order to address the proposed research questions, it is necessary to identify an appropriate data source that has information relating to individuals' migration histories, as well as their family and fertility characteristics after arrival to the UK, and provides sufficient sample sizes to analyse immigrants living in the UK, given that they are a minority group within the general population. The data also ideally need to be representative of the UK population and to capture both recent and more established migrants to the UK.

The 'ideal' data source required to conduct this type of research clearly needs to be quite detailed and comprehensive. Indeed, in other countries where similar research has been conducted with emphases on longitudinal patterns and a life-course approach, there has often been detailed data available, such as population registers that link together key demographic events, including fertility and migration histories, with detailed information on an individual's characteristics (e.g. Andersson, 2004).

Part of the difficulty in conducting this research within the UK context is that there is not one comprehensive data source available with all of the required information. In this section, the third research question is addressed by briefly discussing the relative strengths and limitations of key potential UK data sources for the research. The data sources considered are: the General Lifestyle Survey; the British Household Panel Survey; the 1970 British Cohort Study; the National Child Development Study; the Sample of Anonymised Records; the Labour Force Survey; the Annual Population Survey and the ONS Longitudinal Study.

The General Lifestyle Survey (GLF) (previously known as the General Household Survey (GHS)) is an annual, continuous, cross-sectional household survey

that covers Great Britain, dating from 1971 to the present[1]. The sample of addresses is drawn from the postcode address file. The relative strengths of the GLF for this research are that it contains information on country of birth, nationality and year of arrival to the UK, which are all necessary to determine migrant status and fertility patterns following arrival. Furthermore, it not only contains information on children within a household to give some indication of previous fertility but also asks women to record their birth histories so that complete fertility histories are available, subject to recall error. This is a particular strength for this research where migrants may have migrated without their children, because any births could be identified, regardless of whether or not those children are currently living with their parents. Despite these strengths of the GLF, its major disadvantage is its sample size of approximately 13,000 addresses per annum. In this research, we wish to focus on immigrants to the UK who are a minority population and so require as large a sample size as possible. The small sample here means that by the time the sample is restricted to individuals who are international migrants, there would not be sufficient numbers to conduct the analyses and so the decision was taken to not use the GLF for this research.

The British Household Panel Survey (BHPS), which started in 1991, is a longitudinal, nationally representative study that first covered Great Britain, with later samples added to extend its coverage to the whole of the UK in 2001. Like the GLF, the BHPS also contains information on country of birth and year of arrival to the UK, along with relationships to each member of the household so that a fertility history could be constructed. A further advantage of the BHPS is that it is longitudinal, meaning that it would be possible to follow individuals over time and observe how changes in their characteristics might relate to their fertility patterns following arrival to the UK. However, as with the GLF, the BHPS is limited by its small sample size of approximately 10,000 households across the UK so is excluded here. Furthermore, households were first sampled using the postcode address file in 1991, with boost samples in 1999 and 2001. Other than these samples, individuals only enter the sample if they move in to a previously sampled address, meaning that we would be unlikely to capture sufficient numbers of recent migrants to the UK within the sample.

The 1970 British Cohort Study (BCS70) is also a longitudinal study, which follows a specific cohort of approximately 17,200 individuals born in the UK in a particular week in April. Since our interest is in individuals who were not born in the UK, this survey is limited for our purposes. To some extent, international migrants

[1]There have been some breaks and changes in the survey during this time period - for more details consult the Economic and Social Data Service's website: `http://www.esds.ac.uk/government/ghs`

are represented within this survey because individuals who were born anywhere in the world in the sample week and who are currently living within the UK are included in the cross-sectional samples at particular sweeps. However, attempts to add immigrants to the sweeps were stopped after the cohort reached age 16 years. Thus, the immigrants in the sample covered here would again be very few in number, given the sampling criteria and small sample size. Another limitation of the survey is that it is not conducted on an annual basis, with six sweeps conducted so far, adding another reason for why recent immigrants are unlikely to be well represented. Furthermore, individuals born in 1970 will be in their late 30s now and so the sample would not represent the young recent migrants arriving to the UK in the past decade that are of interest for this research. Similarly, there is an earlier British birth cohort study, the National Child Development Study (NCDS58) with a sample of approximately 17,000 children born in one week in 1958. This is again subject to the same sample size limitations and does not represent the population of interest, since the members of the sample will now be in their late 40s/early 50s.

The Samples of Anonymised Records (SARs) are cross-sectional micro data sources for 1991 and 2001 that are approximately 1% samples taken from the UK censuses for the respective years. The major advantage to these data sources is their sample size, with the household SARs for 1991 and 2001 containing around 200,000 households each. They also contain other information available from the census, which are useful for our analyses, such as country of birth, nationality and questions referring to the number of children in the household, with ages of children so that fertility histories could be constructed. However, the major limitation of the SARs for our purposes is that they only have partial information on year of entry to the UK. That is, we only know if an individual entered the UK within the past 12 months, but there is no further detail on date of entry for individuals who arrived more than a year ago. This is problematic for our research because we need to detect fertility outcomes that have occurred after (and before) arrival to the UK if we are to understand how migrant fertility might contribute to the UK population. For this reason, we choose not to use the SARs for our analyses.

The Labour Force Survey (LFS) is a nationally representative, quarterly, rotating panel survey for the UK, dating from 1992 to the present, in its current quarterly form. The sample of addresses are drawn from the postcode address file, with approximately 60,000 households sampled in each quarter. A major advantage of the LFS is the large sample size covered, along with the fact that it contains information on country of birth, nationality and year of entry to the UK so that migrants can be identified. Furthermore, the frequency of the sampling means that recent migrants are likely to be included in the sample, in addition to migrants who have been living in the UK for longer periods of time. The LFS contains information on

all household members and their relationships to one another so that reproductive histories could be constructed for household members on the basis of who is living with them. However, unlike the GLF, the LFS does not ask questions relating to birth histories so it is only possible to construct partial fertility histories, being unable to identify children who are not currently living in the household with their parents. Another limitation to the LFS is that the panel element means that individuals are followed for five quarters, which equates to one year and three months so the longitudinal element is limited.

The Annual Population Survey (APS) started in 2004 and is released quarterly with each release representing one year of data. The APS contains the LFS sample in addition to boost samples from the English, Welsh and Scottish labour force surveys. Thus, the APS has a larger sample size than the LFS with approximately 170,000 households per dataset, and so is considered to give more robust estimates than the LFS. This is an advantage given that we are interested in a minority group within the UK population. The APS also covers most of the main variables covered by the LFS. However, a disadvantage to the APS is that it did not start until 2004 so there is not as much information available as there is with the LFS for migrants to the UK over a longer period of time.

Finally, the ONS Longitudinal Study (LS) is considered here. The LS links together census data with data from vital registration for a 1% sample of the England and Wales population, from 1971 onwards. Individuals are sampled in to the LS on the basis of four selected dates of birth throughout the year, with records for over 950,000 sample members. The LS also contains data on other members of a sampled member's household taken at census, but does not follow them in the same way between censuses as it does for sampled members. Individuals will be sampled in to the LS if they are born on an LS date of birth with their birth flagged at vital registration, or if they are found to have an LS date of birth at census. Immigrants enter the LS between censuses when they register with a doctor and their date of birth is identified at the National Health Service Central Register (NHSCR).

The LS has both strong advantages and disadvantages for this research. Advantages of the LS are that it covers all of the information required with year of entry and country of birth variables, as well as information on other family members within the household. In addition to this, its major strength lies in the large sample size and longitudinal nature of the sample. The fact that the sample spans back to 1971 means that it is now possible to observe completed fertility histories for some cohorts of women in the sample. Further, births are linked in to the census from vital registration when births occur to sample members, potentially offering more accurate information on fertility outcomes than one can obtain from

constructing retrospective fertility histories from household information[2]. However, disadvantages of the LS include the fact that immigrants are only detected once, and if, they choose to register with a doctor, which means the sample may be biased with respect to entry dates and towards those who are more likely to need health care, such as pregnant women. We may not detect short-term migrants who do not register with a doctor or individuals who are not in need of healthcare. Moreover, detailed information is only gained for individuals once they are linked in to a census, which means that if immigrants leave the country before a census is taken, only very limited information is available on their characteristics. Furthermore, for those immigrants who have entered the UK since 2001 there will not be very detailed information available because there has not been a census taken since their arrival. This is problematic given the changes in the flows in migration since this period and in the foreign-born fertility, which are of particular interest within this research.

Of the data sources discussed above, there are strengths and limitations with each. Some are instantly excluded on the basis of their limitations being too strong, such as with the small sample sizes of the GLF, BHPS, BCS70 and NCDS58, and the lack of information available on year of entry to the UK in the SARs. This leaves the LFS, APS and LS. Despite its limitations, the LS offers the most potential in terms of studying the hypotheses on migrant fertility in the UK with longitudinal analyses, but is limited for recent migrants to the UK who arrived in 2001 or after. This group is particularly of interest given the recent patterns in foreign-born fertility in the UK. Despite the fact that they do not offer the longitudinal component in the same way as the LS, the LFS and APS offer better potential for studying the fertility of recent migrants to the UK. Furthermore, the recent arrival of these groups means that their fertility can not be studied for such long periods of time anyway. Therefore, the LFS is considered the best dataset to use for these analyses. The LFS is preferred over the APS here because the boost samples will not add a great amount of extra information for the population of interest and it is preferable for the analyses to include data from 2001 onwards, providing an update to what is known from the last census.

3.2 The Labour Force Survey

Background:

As discussed in Section 3.1 above, the Labour Force Survey (LFS) is used for

[2]However, there are problems with the linkages of births in to the LS sample.

this research[3]. In this section, the LFS is described in more detail, highlighting the strengths and limitations of its use for these analyses[4].

In Great Britain the survey is managed by the Office for National Statistics (ONS), whilst in Northern Ireland, DETINI (Department of Enterprise, Trade & Investment) are responsible for its management. The LFS started in 1973 as a bi-annual survey, moving to an annual survey in 1984 and then to its current quarterly form in 1992. At this time, the LFS represented Great Britain only, with the Northern Ireland LFS joining the LFS in the Winter quarter of 1994/5, making it representative of the UK population from then onwards. With the change to quarterly release in 1992, several changes, regarding sample size and sample rotation, were made but these are not addressed as this research uses data for 2001 onwards, meaning that forms of the LFS prior to 1992 are not relevant here. The nature of the sample for 1992 onwards is discussed below. In 2006, the LFS quarters shifted to calendar quarters, in line with European regulations but this does not pose difficulties because the relevant quarters have been backdated in to calendar form to ensure consistency over time.

The primary purpose of the LFS is to collect data on labour market information for the UK. However, the fact that households are surveyed and detailed information on the basic demographics, education and employment characteristics of each household member are collected means that the LFS is a valuable data source for other types of social analysis also. Indeed, in this research the LFS is useful because it contains many variables relating to basic demographics, such as age, sex, ethnicity and partnership status, as well as those that are relevant for fertility and migration. The variables on year of first entry to the UK, country of birth and nationality all enable disentanglement of migration histories. Meanwhile, the relationship matrix, which identifies the relationships between each member of the household to one another enables the identification of family types and fertility analyses. It is important that tying together the fertility analyses with the migration variables then allows the differentiation between those births which occurred prior to migration and those which occurred following arrival, in an attempt to understand the nature of the relationship between migration and fertility.

Sample coverage:

The LFS is the largest household survey in the UK, sampling private addresses

[3]Access to the Labour Force Survey data is obtained through the UK Data Archive: Office for National Statistics, Social and Vital Statistics Division and Northern Ireland Statistics and Research Agency. Central Survey Unit, Labour Force Survey 2001-2009. Colchester, Essex: UK Data Archive [distributor].

[4]The information provided within Section 3.2 is based on that contained within the 2009 version of Volume 1 of the Labour Force Survey user guide, available at: `http://www.statistics.gov.uk/downloads/theme_labour/Vol1-Final-2009.pdf`

drawn from the Postcode Address File (PAF)[5] for 99% of the Great British population. The PAF is used to sample private addresses within Great Britain which are south of the Scottish Caledonian Canal. For the area north of the Caledonian Canal, the sample is drawn from the telephone directory and thus, is slightly biased in that it does not represent individuals who are not listed but the area is so sparsely populated, constituting such a small proportion of the total sample that this is considered to be the most pragmatic sampling method. The sample for those living in NHS accommodation is drawn from a frame provided to ONS by the NHS and is thought to represent 92% of all NHS accommodations. These samples are single stage samples drawn with a random start and constant interval. The Northern Ireland (NI) sample is drawn from the 'Valuation List', which is grouped into three geographical strata. The NI sample is drawn at random, without replacement, within each strata. In effect, the LFS can be considered as a simple random sample. The survey represents approximately 0.1% of the UK population, with roughly 53,000 households interviewed each quarter.

Information is collected for all individuals at a sampled address, including those who are away temporarily for a period of less than six months, children aged 16 or under (even if they are away at boarding schools) and students aged over 16 who are living away from home in halls of residences or equivalent accommodations[6]. Individuals who are sampled at more than one address will be included at the address which is considered to be their main residence. The interviews can be given by proxy by another suitable household member in the event that a particular individual is unavailable (the implications of this are discussed below).

The survey is not completely representative of the total UK population because not all individuals living in non-private, communal establishments are represented. These include establishments such as psychiatric and hospital care homes, nursing and residential care homes, children's homes and prisons. The omission of these establishments equates to approximately 1.5% of the GB population not being represented within the LFS. This is not considered to be a great limitation for this research because the interest is on international migrants and their fertility patterns, so is interested in those individuals who are living within private households and ultimately, family units. It will mean, however, that migrants who live in communal establishments for educational purposes, and whose parents do not live within the UK, will not be sampled within the LFS. Further, migrants who migrate to the UK for short-term, economic migration will not be sampled if they

[5]The PAF covers approximately 97% of private addresses.

[6]The students are included at their parents' address, which means that the household unit is defined slightly differently to that used in comparable social surveys, such as the General Lifestyle Survey, and therefore the household units in the LFS will be slightly larger on average.

are living in collective accommodation, such as hotels, boarding or guest houses. However, such migrants will be sampled if they are living in shared housing at private addresses. Thus, the sample of international migrants found in the LFS may be slightly biased towards those individuals who are more oriented towards settlement or family building than might be expected to be found in the total population of international migrants to the UK. On the other hand, individuals can be identified by their country of birth so migrants who have lived in the UK for less than a year at private households can be identified as opposed to the normative convention of international migrants defined on the basis of living within the UK for at least 12 months, so in this sense the LFS offers the advantage of the detection of short-term migrants too.

The LFS sample is a rotating panel with households surveyed for a total of five quarters (where attrition is absent). Thus, in each quarter, 20% of the sample are in their first wave of interview, whilst 20% are in their second wave, 20% in their third wave and so forth, equating to 80% of the sample being repeated at each quarter. The method of survey at the first wave is to conduct face-to-face interviews, whilst subsequent interviews are conducted via telephone where possible. The interviewing is conducted on a continuous basis, meaning that the information collected represents every week of the year[7], so the estimates given by a particular quarter can be considered as a three-month rolling average. However, as is described in Section 3.3 below, quarters for many years are combined for this research, which means that in some cases the estimates represent averages across years.

Non-response:

The panel nature of the LFS means that individuals or households could drop out of the survey at any of the five waves of interview. In other cases, some individuals or households may not be successfully sampled at initial waves due to non-contact but join the survey at later waves. Thus, the panel element of the survey is something that needs to be considered in the calculation of non-response. Accordingly, if households drop out of the survey, they will not be further contacted but are retained in the eligible sample, which is used for non-response calculations. The response rate is then calculated on the basis of the number of households found and successfully interviewed at a particular wave in relation to the number of households eligible for interview at that wave (including those who have previously dropped out).

Response rates have declined over recent years. The total response rate for the LFS remained above 60% in January-March 2006, but the response rates vary

[7] An exception to this is the week of 1st-7th March 2004, which was omitted as a 'leap week' in order to bring the timing of the LFS back into line with the quarters represented.

greatly according to the wave of interview. Nonetheless, the overall response rate of the LFS is still sufficiently high for a large-scale social survey.

Characteristics associated with non-response were identified in a study, which compared 2001 LFS data to 2001 Census data. The results found that non-response does not occur randomly and therefore could be problematic because certain types of individuals will be more represented than others, to an extent that is not representative of the UK population and therefore produces biased results. Of particular interest to this research is the fact that individuals are represented differently according to their age, marital status and level of education, all of which are importantly associated with fertility. Indeed, non-response varies according to the number of dependent children one has. With regards to country of birth of the household reference person, those born outside the UK were found to have higher non-response related with non-contact, although this variable was not strongly related to total non-response. This is obviously an important issue for this research because individuals who would be defined as migrants may be under-represented within the LFS due to contact not being established with households at the sampled address. Differential non-response can be partially compensated for by applying weights to the data.

Weighting the LFS:

The application of weights to LFS data allows estimates to be produced that are representative of the UK population of private addresses, whilst also correcting for differential non-response amongst different sub-groups. Weights are needed for these analyses, even if differential non-response was not a problem, if the goal is to provide estimates at the population level. The weights are applied to the data to gross up estimates from the sample to represent the population.

Each weight within the LFS equates to how many individuals in the total population are represented by the one individual to whom the weight is applied. If differential non-response was not present in the LFS, the weights would simply be the reciprocal of the probability of being selected in to the LFS sample, where all individuals have an equal probability of being selected in the most basic scenario, such as with simple random sampling. However, the weights also need to be altered to allow for the fact that differential non-response is present, which is problematic when certain individuals are more likely to be represented than others in a way that is disproportionate to their actual representation within the wider population (i.e. non-responding groups will be under-represented, whereas, other groups may be over-represented). Thus, individuals who have a lower probability of being sampled, due to non-response, are given larger weights to re-balance the representation of the population of interest.

ONS derive the weights by breaking down known population estimates into key sub-groups and then identifying the number of individuals falling within each sub-group within the LFS. The number of cases in the population sub-group is then divided by the number of cases in the sample sub-group. Thus, it is evident how the larger the probability of being sampled and represented in the LFS for a particular sub-group, the smaller the weight allocated to each member of that sub-group because there are more individuals to divide by. Conversely, the fewer the individuals represented of a particular sub-group, the weight allocated to each will be larger because they each need to represent more individuals.

Until the implementation of the 2007/2008 re-weighting programme of the LFS, the weights were derived in three stages, where estimates for three different sets of characteristics were used. In the first stage, population estimates for local areas were used to weight cases for non-response at the local area level. Secondly, non-response, which is found to be particularly prevalent amongst young individuals, was corrected for using age and sex population estimates. The third stage then involved correcting the estimates for non-response broken down by age groups, sex and region. The weighting was conducted in three stages to avoid breaking the estimates down by several variables at once and ending up with empty cells for some sub-groups, which would have meant that no weight could be allocated to that group. The process was iterated, as adjustments made at later stages may affect calculations at earlier stages and by iterating several times, the weights produced more reasonable estimates for the population according to each of the characteristics used in the three stages. With the introduction of the re-weighting programme in 2007/2008, the method for producing the LFS weights was altered, with a single stage process now used instead of the three stage iterative process[8]. However, the non-respondent characteristics corrected for in deriving the weights are still those described here.

For data after 2001, when the last census was taken, mid-year population estimates are used to provide the population estimates in the derivation of the sample weights. Mid-year population estimates (and projections) are calculated by taking the estimates from the last census of the population and then using information from several data sources to account for population changes that have occurred between the census estimates and the date for which the current estimates are being produced. Data on internal migration is provided by the NHSCR (NHS Central Register), whilst international migration information is collected from the International Passenger Survey (IPS) and data on births and deaths are taken from vital registration. The importance of the LFS re-weighting exercise in 2007/2008 relates

[8]See Office for National Statistics (2009b), p.54 for more technical details.

to the change in mid-year estimates of population used. Prior to this exercise, mid-year estimates had been based on mid-year estimates up until 2003, which had been released in early 2003. The new weights are derived using mid-year estimates from up until 2006 that had been based on census data released late in 2003, which had been revised. Thus, the new weights should be more representative of the actual population after initial problems with the 2001 census, such as the undercounting of certain sub-groups, had been corrected for.

The weights provided are used in the analyses of LFS data within this thesis. These do not directly correct for non-response differentials according to country of birth, but the correction for individuals according to age, sex and geographical area groups may partially address this issue. Migrants tend to be younger on average than the non-migrant population and also concentrated within certain geographical areas. If some migrants of the countries of birth for which non-response is high *are* sampled, this should not be a problem as they may be corrected for in the other corrections. It is when the individuals who are not represented are systematically different from those who are that the weighting will be less effective in countering the non-response biases. It may be that the migrant groups who are likely to be non-respondents, due to non-contact, are those who have recently arrived in the UK or who are less settled at a particular address. If this is the case, these types of migrants may be less well represented than other migrant groupings.

This research focuses on migrants who establish or live with their families in the UK and their childbearing behaviours in the UK. This group is likely to be better represented in the LFS, since such individuals are expected to be more likely to live at private addresses and to be more settled. However, a limitation remains in the fact that other migrant groups may be under-represented, when these would have been informative in establishing the characteristics of individuals whose migration trajectories are not associated with family formation and fertility at that point in time.

Data Quality:

As mentioned previously, if an individual is unavailable for interview, their information may be collected via a proxy interview, to maximise the information collected and minimise costs associated with having to otherwise return. Proxy interviews are also collected for economically inactive individuals aged 70 years and above. Approximately one third of all responses within the LFS are collected by proxy. Proxy responses are not randomly distributed but are more common amongst individuals aged between 16-19 years, amongst males rather than females, and amongst non-white ethnic groups more so than amongst white ethnic groups. Therefore, it is important to question the accuracy of data collected on

behalf of another individual and whether the collection of information by proxy introduces serious biases into the data.

A study (Dawe and Knight, 1997 cited in Office for National Statistics, 2009b) on the validity of proxy responses in the LFS found that the accuracy of proxy responses varied according to the nature of the question asked and by whom the proxy interview is given, in terms of their relationship to the individual the interview is being given for. Proxy responses for age, sex, de facto marital status, economic activity and whether the individual had a second job were all found to have high accuracy rates of over 90%. Many other variables had fairly high accuracy rates of between 80-90%, which included educational qualifications when the individual had obtained a first degree. However, for lower-level qualifications, such as GCSEs, and other responses relating to number of actual hours worked in the past week and income, much lower levels of accuracy were found, ranging from 20-30%. However, as noted, many of the variables for which low levels of accuracy were found were also those for which individuals themselves had more problems with recall error, due to the greater amount of detail often required. Thus, low accuracy for these variables was not to be unexpected.

Overall, the levels of accuracy for most variables that are used in this study were found to be good. However, one cause for concern relates to the age of leaving full-time education variable, which is used in this analysis, and was found to have a gross error rate higher than one third. This is again a precise variable, subject to individual recall error. When the values for such variables are banded or aggregated into groups, the degree of agreement between the proxy and actual respondent substantially increases. In this analysis, the values of the variable are banded, which should minimise the problem of recall error for both personal and proxy respondents but caution is maintained in interpreting results from analyses using this variable, given that it is subject to recall error for not only proxy, but also personal respondents.

Individual versus household releases of the LFS[9]

The fact that information is collected for all individuals within a household means that the LFS lends itself to analyses not only at the individual level but at the family and household level also. However, since the original purpose of the LFS was for individual-level analyses, the data are not necessarily organised in a way that provides the best outputs for family and household analyses. To avoid this issue, two different versions of the LFS are released, one of which is the

[9] The information for this section is based on the 2008 version of Volume 8 of the LFS user guide, available at: `http://www.statistics.gov.uk/downloads/theme_labour/vol8_2008.pdf`

original LFS and then a second which is the Household version. When conducting analyses, it is necessary to decide which of the two versions is most appropriate to use. The household and individual LFS releases are based on the same samples and contain almost all of the same variables. The exceptions are that the household version contains more variables that have been specifically derived to facilitate family and household related analyses, such as family unit type, at the cost of the omission of earnings variables and the more detailed geography available in the individual version[10].

Two other major differences separate the datasets. The first is that the household version of the LFS is only released for two quarters of the year (April-June, and, October-December) as opposed to all four quarters of the year as with the individual version. The second difference relates to the weights provided with each version of the dataset. In the individual version, each individual is given a specific weight, with those who are economically inactive allocated a weight of zero. The household version, on the other hand, allocates the same weight to all individuals within a household, even for those who are economically inactive. The necessity of providing different level weights stems from the fact that analyses of family-level characteristics have produced inconsistencies in the estimates provided using the individual version of the LFS. However, the household version provides consistent results for estimates of family or household level variables because members within the same household are given the same weight. Thus, it is recommended that, particularly where weighting is required, the appropriate version of the dataset is used according to the level of analyses of interest. If the interest is in producing analyses at the individual level but by family or household characteristics, such as in this research with the exploration of partnership characteristics and fertility behaviours, the household version should be used.

The weights provided in the household version of the LFS correct for non-response by age-group, sex and government office region. However, household-level non-response is not accounted for. If households vary in their response rates according to country of birth, this might mean that the migrant households detected within the LFS sample are not representative of the wider population of migrant households, if they are different to those sampled with respect to age, sex and government office region.

In this research, the household version of the LFS is used because it provides more information on family related variables and facilitates family-level analyses, providing the appropriate weights for producing analyses of individuals by their

[10]The lowest level of geography available in the household releases is at the Government Office Region level.

family and fertility characteristics. The loss of data on detailed geography is not problematic since the small sub-groups in the analysis mean that it is unfeasible to disaggregate estimates by detailed geography in addition to the other characteristics examined. The omissions of earnings data is also unproblematic because this variable is not of interest within these analyses. The slight disadvantage to using the household LFS is that it is only released for two quarters of the year, which makes pooled sample construction less straightforward than with the individual version, where sampled individuals are observed at all of their interview waves. This is discussed further in the description of sample construction below.

3.3 Sample

The stages involved in the construction of the LFS sample are shown in Figure 3.1. Firstly, the April-June quarters of the household version of the LFS are combined for the years 2001 through to 2009[11]. Respondents in their fifth wave (215,494 individuals) are then dropped from the sample to avoid any repetition of individuals, as these individuals would have been in the wave one sample of the April-June quarter for the previous year. At least, this is true for the majority of cases where households and individuals were successfully contacted and interviewed at wave one. If they did not enter the survey until a later wave, they will be omitted from this sample altogether. This is true more generally for those who did not enter the sample until after the wave that is selected for the sample in April-June, as the sample is designed to be cross-sectional, so if individuals were missed at the April-June quarter but subsequently found they will not be included in the sample. Individuals might enter the survey at later waves for a number of reasons, including failure to make contact with the household in previous waves or if they join a household that is already participating in the survey.

Non-respondents (23,581 individuals, equating to 2.51% of the total sample) are then removed from the sample because there is not the necessary information, required for the analyses, available for such individuals. Those individuals whose country of birth or year of entry information is missing or erroneously reported[12] are also removed from the sample[13], as these key variables are required to develop the migrant identifier variable used for the analyses (described in Section 3.4 be-

[11]The April-June quarters are preferred here over the October-December quarters because additional migration variables are available in the April-June quarters, and the most recent weights are available for longer periods of time in these quarters than they are for the October-December quarters.

[12]For example, there were 15 individuals whose recorded year of arrival was for before they were born.

[13]929 individuals were removed from the sample here.

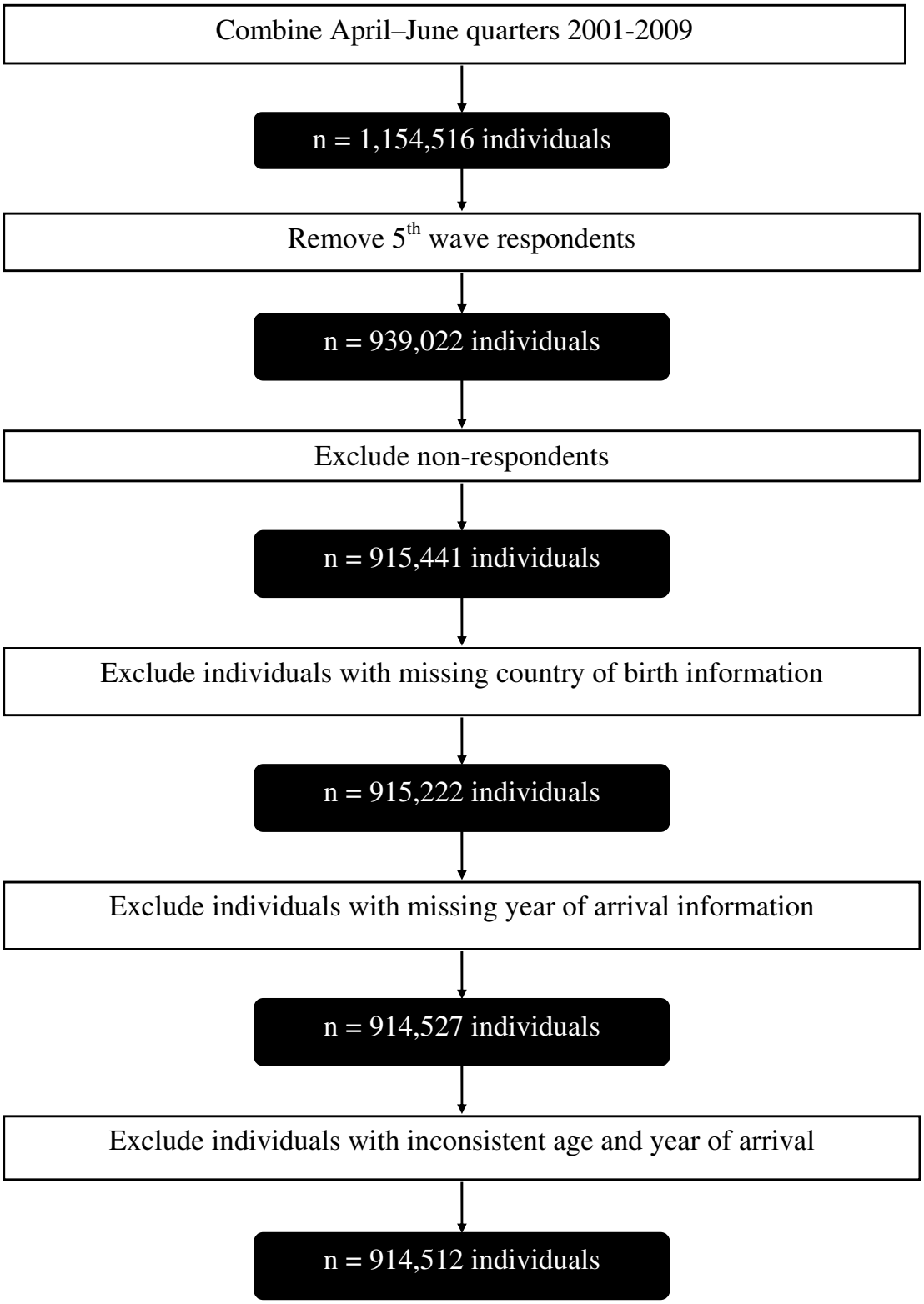


Figure 3.1: Stages involved in the construction of the pooled sample, using Household Labour Force Survey (LFS) April-June Quarters from 2001-2009.

low).

Within the sample, 8.6% of individuals are foreign-born[14]. This is slightly lower than might be expected in the general UK population, where international migrants constitute approximately 10% of the population. However, this sample is aggregated from 2001 to 2009 so reflects the different proportions of the population constituted by migrants across this time period. For example, when analysing the number of migrants and non-migrants in the sample for particular years, it can be seen that for those interviewed in 2009, migrants do constitute approximately 10% of the general population in comparison to approximately 7% for those interviewed in 2001, reflecting the increases in the proportion of migrants in the UK population over this time period. The age and sex distributions of the total sample and by migrant status are shown in Figure 3.2. Figure 3.2 looks fairly similar to what would be expected for the UK population, considering that the data is pooled for 2001-2009. The most interesting point to mention here is the young age structure of the foreign-born group in comparison to the UK-born group, as we would expect (e.g. Mulder, 1993), emphasising the important contribution made to UK population structure by young migrants of working and childbearing ages.

Finally, Figure 3.3 shows the selection criteria and sample sizes for each of the sub-samples that are used for the different analysis stages in Chapters 5, 6 and 7.

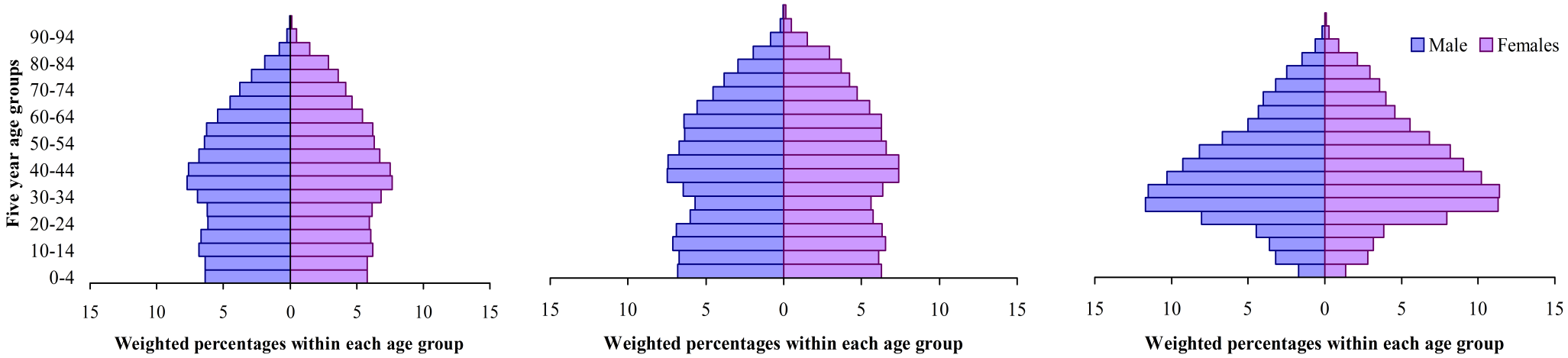
3.4 Variables and definitions

Age at survey

In Chapters 5 and 6, the analyses focus on individuals aged 20-34 years at the time of survey. These ages are chosen because the interest of the research is on partnership formation and family formation amongst young, recent migrants to the UK. The 20-34 years age band reflects both the young ages at which these events often occur and the young age structure of the foreign-born population (see Figure 3.2). Furthermore, as discussed above, these are the ages at which foreign-born females are particularly contributing to UK childbearing, with 39%, 88% and 100% of the recent increases in UK fertility at ages 20-24, 25-29 and 30-34 years, respectively, attributable to foreign-born fertility (Tromans et al., 2009).

In contrast to Chapters 5 and 6, Chapter 7 analyses data for females aged 15-64 years as the time of survey. This is because the information is used to create retro-

[14] All individuals whose country of birth is outside of the UK are included in the foreign-born population. Those from the Isle of Man and the Channel Islands are also included as foreign-born because these countries are not part of the UK, although they are crown dependencies.



(a) Total Sample, *n=914,512*

(b) UK-born, *n=835,912*

(c) Foreign-born, *n=78,600*

Figure 3.2: Population pyramids to show the age and sex distribution of the UK population 2001-2009, for the total sample, UK-born, and Foreign-born groups

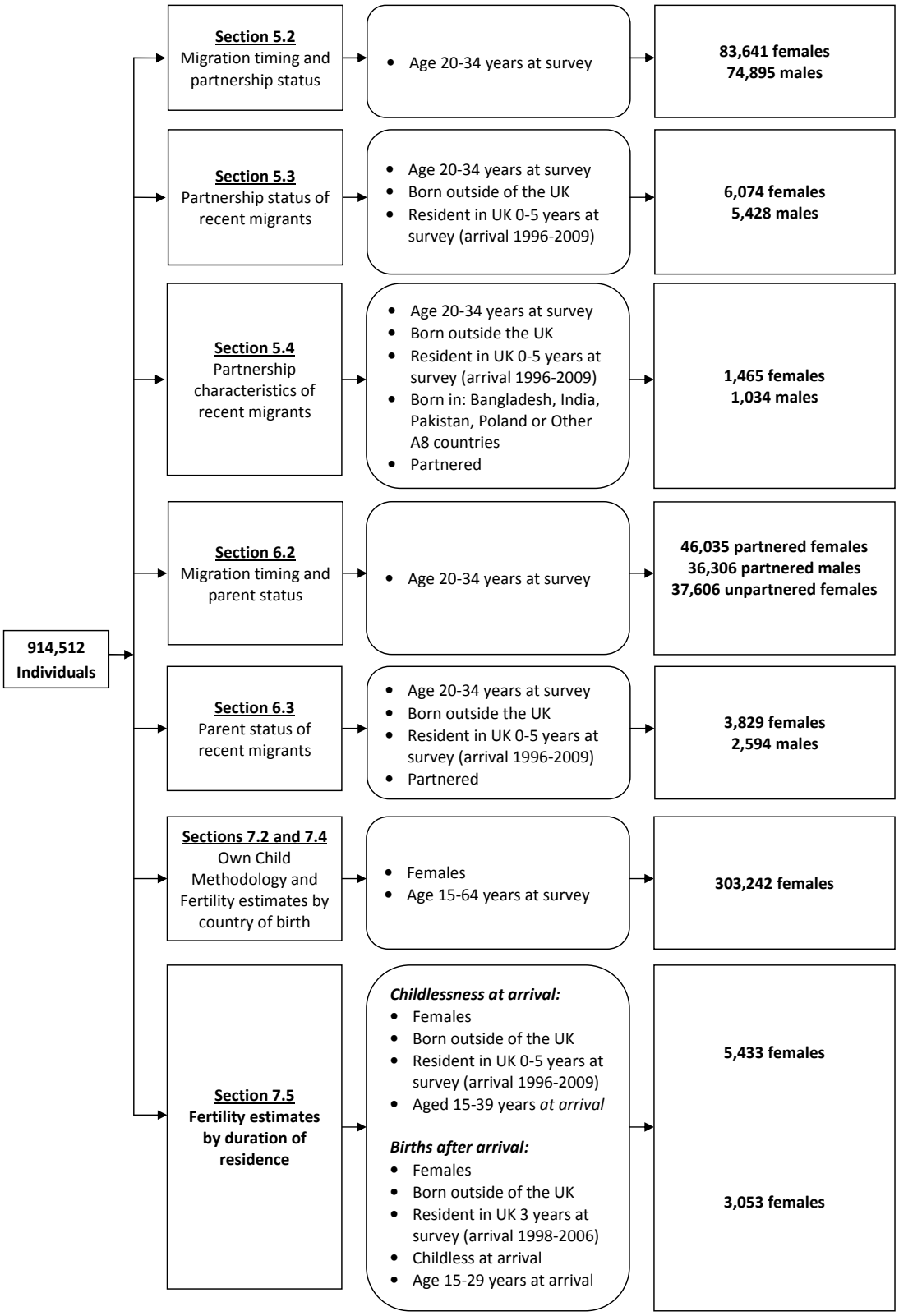


Figure 3.3: Selection criteria and sample sizes for sub-samples used in the analyses presented in Chapters 5, 6 and 7

spective fertility histories for when women were at younger ages, as is explained further in Section 7.2 when describing the Own Child Method.

Migrant status

Of great importance to this research is how to operationalise the definition of a migrant and how to further distinguish between migrant groups to identify those who are 'recent' migrants so that the importance of migration timing can be considered throughout the analyses.

The first question of defining a migrant is a relatively simple one, with all individuals born within the UK considered as non-migrants for these analyses, and individuals who were born outside of the UK considered as migrants. As discussed above, individuals born in the Channel Islands or the Isle of Man are also included within the migrant group here. Whilst individuals born within the UK may be migrants, it is not possible to treat them as such within this research because the year of arrival to the UK question is only asked of individuals whose country of birth is outside of the UK. It is also important to note that a further limitation of the year of arrival variable (cameyr) used for these analyses is that it asks the year of first arrival to the UK and so if individuals have left the UK between that stay and the current stay, this will not be detected. Given that the interest is in recent migrants to the UK, it will hopefully be less likely that individuals have left between the year of arrival and the current stay when interviewed. Follow up variables are now being introduced into the LFS asking whether individuals have continuously stayed in the UK since their first arrival and if not, what their most recent arrival year is. However, these variables are not yet publicly available at the time of conducting these analyses.

The question of identifying recent migrants is more complex, given the nature of the data but is important in order to make comparisons between 'recent' and 'established' migrants to disentangle issues relating to the timing of migration events. Since the period from 2001 onwards is that in which much change has occurred in relation to immigration flows and proportions of births to foreign-born females in the UK, and is therefore the period of interest for this study, one approach is to define recent migrants as individuals who arrived from 2001 onwards. However, this period based approach is complicated due to the pooled nature of the dataset which means that individuals who arrived after 2001 may have in fact been resident in the UK for longer periods of time than individuals who arrived prior to 2001.

A second approach is to define a recent migrant on the basis of duration of residence within the UK, but in this case individuals may have arrived in the period

prior to 2001 and still be defined as recent migrants. The importance of such issues in operationalising 'recent' migration is an interesting theme for this research given the complexity of the pooled sample used.

A comparison of the two differing approaches to defining migrant status, shown in Table 3.1, reveals that the two approaches are fairly similar. Table 3.1 indicates that the majority of individuals who are defined as recent migrants according to the period based measure (arrival to the UK from 2001 onwards) are also those defined as recent migrants by the duration based measure (resident in the UK 0-5 years). However, there are a small number in each group where individuals defined as recent migrants according to one measure are defined as established migrants by the other, and vice versa. For example, of 6,192 individuals defined as recent migrants born in Europe by the period approach, 464 (7.5%) are defined as established migrants by the duration based approach because they arrived after 2001 but have been resident in the UK for longer than 5 years. Note that the duration of residence based approach offers larger sample sizes for the recent migrant groups because this definition allows individuals to have arrived within a wider time period, than does the period based approach.

Since one of the main interests in comparing the recent migrant group with established and non-migrant groups is to assess the importance of the timing of the migration event in relation to other family related events, it is considered that the duration of residence approach is most appropriate here. It is more substantively important to examine how individuals who have been in the UK for only short lengths of time compare to those who have been resident for longer periods of time, more so than how individuals arriving in 2001 compare to those arriving in 2002, for example. It is the 2001-2009 period that is of primary interest, but individuals who arrived prior to 2001 but who have only been resident for up to 5 years still contribute to the patterns of recent migrants in this time period. This means that for the analyses comparing recent migrants with established and non-migrants in each chapter, 'recent' migrants have migrated to the UK between 1996[15] and 2009, whilst 'established' migrants have migrated up until 2003[16]. Thus, the periods in which recent and established migrants arrived in can widely differ under this approach.

Country of birth

The analyses conducted to address the second research question relating to the differences between recent migrant groups are presented in Sections 5.3, 5.4 and

[15]For example, an individual interviewed in 2001 who arrived to the UK in 1996 is defined as a recent migrant under the duration definition, as their years since arrival is equal to five. This is calculated by subtracting the arrival year (1996) from the current survey year (2001).

[16]E.g. Individuals who were interviewed in 2009 and arrived in 2003.

Table 3.1: Comparison of period and duration of residence based measures of migrant status, by region of birth

Period of arrival	**Duration of residence in the UK (years)**							
to the UK	UK-born	≥6: Europe	≥6: Asia	≥6: Other	≤5: Europe	≤5: Asia	≤5: Other	Total
UK-born	**661,802**	0	0	0	0	0	0	661,802
<2001: Europe	0	**18,398**	0	0	*1,368*	0	0	19,766
<2001: Asia	0	0	**17,167**	0	0	*1,244*	0	18,411
<2001: Other	0	0	0	**16,481**	0	0	*1,610*	18,091
≥2001: Europe	0	*464*	0	0	**5,728**	0	0	6,192
≥2001: Asia	0	0	*769*	0	0	**4,247**	0	5,016
≥2001: Other	0	0	0	*741*	0	0	**4,054**	4,795
Total	661,802	18,862	17,936	17,222	7,096	5,491	5,664	734,073

Source: UK Labour Force Survey, April-June Quarters 2001-2009

n=734,073 individuals, aged ≥15 years.

Bold font indicates agreement between the two definitions

Italicised font indicates differences between the two definitions

6.3. The countries of birth focused on in these analyses are Bangladesh, India, Pakistan, Poland and 'Other A8'. The Other A8 group contains the remaining seven countries that joined the European Union at the same time as Poland in 2004[17]. These countries are chosen because they rank amongst the top countries of birth of foreign-born parents having live births within the UK in the most recent period, and are therefore important for understanding recent foreign-born fertility patterns. However, the exception is the Other A8 countries, which are included as a comparison group because of the similarity of their migration systems and fertility levels at origin to those of the Polish group. Due to small sample size issues, the Pakistani and Bangladeshi groups are combined together, due to the similarities in their fertility levels and demographic patterns in the countries of origin[18].

Duration of residence in the UK

Duration of residence in the UK is analysed in more detail when studying differences between the recent migrant groups in Sections 5.3 and 6.3. Duration of residence in the UK is created by subtracting year of arrival to the UK[19] from the year of survey. This will be subject to some error because the greatest level of precision available is in years. For example, two individuals surveyed in 2008, who arrived to the UK in January and December 2004, will both have 4 years of residence, when there is in fact a difference of 11 months between their stays. Similarly, two individuals surveyed within 2008 and who arrived in December 2003 and January 2004, will have 5 and 4 years of residence, respectively, when there is in fact only a difference of 1 month in their stays. To some extent, the underestimation and overestimation of duration of residence will counteract each other, and the variable is also aggregated into bands, which also helps to minimise error. The categories for duration of residence are: 0-1, 2-3 and 4-5 years of residence.

Age at arrival to the UK

In Sections 7.4 and 7.5, the fertility patterns of females by country of birth and duration of residence in the UK are estimated by age of arrival to the UK. Age of arrival to the UK is calculated by subtracting the number of years of residence in the UK (using the single years version of the duration of residence variable described above) from age at survey. This measure is subject to some error because the greatest level of precision available for both age and duration of residence is in years. However, as with duration of residence, slight overestimation and under-

[17]The seven 'Other A8' countries are: Czech Republic, Estonia, Hungary, Latvia, Lithuania, Slovakia and Slovenia.

[18]Note that it is acknowledged that there are important differences between Pakistani and Bangladeshi groups in their demographic behaviours, but they are relatively speaking very close in behaviours in comparison to the other groups considered here.

[19]Year of arrival is measured by the 'cameyr' variable. Recall that this refers to year of first arrival to the UK and so does not allow for subsequent migrations.

estimation of age at arrival should counterbalance one another, and estimates are aggregated into five-year age groups, also acting to minimise error.

Partnership status

The partnership status variable used for analyses in this research is derived from the family type (futype and futype6)[20] and relationship to the head of family unit (relhfu) variables in the LFS. In the LFS, "a family unit can comprise either a single person, or a married/cohabiting couple, or a married/cohabiting couple and their never-married children who have no children of their own living with them, or a lone parent with such children" (Office for National Statistics, 2008, p.4), meaning that if an individual is the adult child of the family head, they can be assumed to not be living with a partner or any of their own children. Therefore, using the family type and the relationship to head of family unit variables gives sufficient information to identify whether or not individuals are living with a partner. This same technique is also used to identify whether or not individuals are living with children in Chapter 6 (see below for the definition of 'parent status').

The partnership variable used throughout these analyses refers to *de facto* marital status with individuals defined as being in a partnership, regardless of whether it be as a part of a cohabiting or married couple. Thus, individuals who are separated, divorced or widowed could be categorised as partnered or unpartnered, depending on whether or not they are currently living with a partner since the partnership status variable is measuring the *present relationship* status. Since the LFS identifies individuals as being partnered on the basis of their relationships with other individuals within the household, partnership status as defined here, refers only to those individuals who are *living* with partners. It is not possible to identify partners living at separate addresses[21]. This an important point to note for these analyses since it could be the case that individuals migrate without their

[20]The 'futype6' variable was introduced in 2006 to replace the earlier 'futype' variable in line with the introduction of civil partnerships in the UK in December 2005, following the Civil Partnership Act 2004. The 'futype' variable had one category for those in same sex partnerships, which coded them as same sex family units and did not differentiate between those who did and did not have children. The newer variable introduced more categories for same sex relationships, differentiating between same sex cohabiting couples and those in civil partnerships, as well as by whether or not they have any dependent or non-dependent children. To create a consistent variable over time for these analyses, individuals in same sex family units in the earlier variable were reallocated in to the more detailed categories of the 2006 version using the relationship matrix information available in the LFS and Volume 4 of the LFS User Guides (Office for National Statistics, 2009d), which provides information on the creation of futype6.

[21]There is a variable (marchk) within the LFS that relates to a question asking whether an individual is living with their spouse but is only asked of those who have answered that they are married and living with their spouse on an earlier marital status question, and so is aimed at identifying those who do not live with their spouse due to one spouse working away or spending time in prison, for example. There is not a general question asked of all individuals with regards to whether they have a partner that they are not currently living with. Those individuals who are partnered but unmarried and also not living with that partner would not be identified here.

partners, to be later joined by these partners or to return to their partners in the cases of family reunification and temporary / circular migration, respectively.

Limiting the analyses to partners who live within the same household does mean that it is not possible to establish the full relationship between migration and partnership status but it is possible to provide an insight into which migrants are living with partners whilst residing in the UK and therefore what their potential for future childbearing might be. Thus, in assessing the relationship between migration and family formation in the life-course, these analyses are able to capture some part of that process, accounting for those parts experienced within the UK. For this research, one of the main interests is with regards to the consequences for the UK population, which it is possible to consider here. However, the research is also interested in the relationships between migration and partnership formation in the life-course, which can only be partially assessed here, given the currently available data. The available information allows one to address to what extent recent migrants are migrating alone and to what extent they are forming partnerships after arrival, or migrating with or to join partners.

Parent status

The definition of parent status used in Chapter 6 refers to that of being a 'current' parent, since it is only possible to detect children who are living within the same household as their parents at the time of survey. This provides further justification for the focus on those aged 20-34 years for the analyses of parent status, with the upper limit of 34 years reducing the likelihood of including individuals within the sample for whom it is possible to have older children who have already left the parental home. The lower age limit of 20 years is also appropriate, due to the very small numbers of migrants who are found to be parents at ages 15-19 years. The parent definition refers to own, adopted, foster and step-children, reflecting the status of having a 'parental role'[22].

Partner's migrant status

The importance of partner's migrant status is considered for recent migrants in Section 6.3.1, when predicting the probability of being a parent. Individuals are matched to their partners using the relationship matrix provided in the LFS (which is also used for the Own Child Method, as described in Section 7.2), making it then possible to analyse the characteristics of their partners. Partner's migrant status is based on the country of birth (using cryox and cryox7 variables) values for part-

[22]The interest in Chapter 6 is to use this more inclusive definition to consider the general family types migrants are living in with regards to whether that includes children, whilst more restrictive analyses of own, dependent children are later presented in Chapter 7, where fertility patterns and the timing of fertility in relation to migration are considered.

ners. Partners born in the UK are categorised as non-migrants, whilst partners born outside of the UK are categorised as migrants. For individuals with migrant partners, their year or arrival to the UK value[23] is compared to that of their partners, and where it is equal they are categorised as having the same arrival, where it is more recent, the partner is categorised as having arrived before, and, where it is earlier, the partner is categorised as having arrived after. Thus, the categories for the migrant partner variable are: UK-born; migrant: same arrival; migrant: arrived before; and, migrant: arrived after.

Years of education

Unfortunately, whilst the LFS does have many comprehensive variables on educational qualifications for the general population, all foreign qualifications attained outside of the UK are coded simply as 'other', without any real indication of the UK equivalent standard. In an attempt to overcome this problem, other analyses (Lindley and Lenton, 2006) have constructed a variable based on 'years of schooling'. We follow this approach here, using information on the age at which an individual completed continuous, full-time education[24].

Years of schooling are calculated based on the age at which an individual left full-time education for individuals who have already left education, and based on current age for those still in full-time education. A value of five was then subtracted from all of the values to allow for the infant period before entering education. The limitation of this measure is that school entry times may not be comparable between countries of birth, nor may the number of years equate to equivalent qualifications between countries of birth. However, this is the best information available within the LFS for education amongst foreign-born groups. The variable is categorised into <11 years of education, reflecting less than compulsory level of education (based on the UK system); 11-13 years of education, reflecting those with GCSEs to A-levels; and finally 14+ years of education, representing those who have degree or equivalent levels of education.

Economic activity

The economic activity variable used for this research has the following categories: employed, unemployed, full-time student and inactive. This variable is constructed by first taking an individual's economic activity status[25], based on ILO (International Labour Organisation) classifications (see Office for National Statistics (2009a) for more detail). The inactive category is then disaggregated into those

[23]Given by the cameyr variable.

[24]The 'edage' variable from the Labour Force Survey provides the information used to create this variable.

[25]This is based on the 'ilodefr' variable within the LFS.

who are economically inactive because they are full-time students versus those who are economically inactive for all other reasons[26]. Full-time students who are also employed are included in the student category rather than the employed category, as the fact that they are students will likely be important for their family formation patterns.

[26]Full-time students are identified using the 'cured' variable (values of 1, 2 and 3) in the LFS, which relates to current education received. This is the variable recommended for use by ONS when identifying full-time students. See Office for National Statistics (2009c) for more details.

Chapter 4

Regression analyses

4.1 Introduction

In this chapter, the logistic regression used to explore partnership (Chapter 5) and parent status (Chapter 6) is described. To address issues relating to the timing of migration and differences between groups with regards to their partnership and parent statuses, it is appropriate to model such relationships within a multivariate framework. Section 4.2.1 introduces *Generalised Linear Models*, the family of regression models from which logistic regression originates, whilst Section 4.2.2 describes logistic regression in more detail and the rationale for its use within this research. Sections 4.2.3 and 4.2.4 outline how logistic regression is implemented and interpreted within the thesis.

4.2 Multivariate analyses

Within Chapters 5 and 6, initial exploratory analyses are conducted to examine the bivariate relationships between variables, such as migrant status, and the outcome of interest, partnership status and parent status, respectively. To better understand such relationships, it is appropriate to use multivariate regression techniques, which allow for the inclusion of several variables within the modelling framework at one time. This is important as it allows controls to be made for the effects other variables may have on the observed relationship between a particular variable and the outcome of interest.

A useful example is to consider the case in Chapter 6, where the first logistic regression models fitted investigate whether migration timing is associated with delayed entry to parenthood. In this case, it is extremely important to also control for the effects of age because we have seen that the recent migrant group has a younger age structure than the established migrant group (Figure 3.2) and know

that the probability of being a parent increases with age. The inclusion of age and migrant status variables within the multivariate framework allows consideration of the relative importance of each for parent status, whilst controlling for the influence of the other. This extends to all covariates included within the regression models.

4.2.1 Generalised Linear Models

The regression techniques applied in this research fall within the framework of *Generalised Linear Models (GLMs)*, which are a group of regression models first formulated by Nelder and Wedderburn (1972) and subsequently extended in the work of McCullagh and Nelder (1989). These works suggest that methods associated with linear parametric regression, such as ordinary least squares (OLS) regression, can be extended to other models where the response variable is not continuous and where its relationship with the explanatory variables may be non-linear (Agresti, 2002; Hutcheson and Sofroniou, 1999; McCullagh and Nelder, 1989; Nelder and Wedderburn, 1972).

There are three key components that unify GLMs as a single class of models. The first of these is the *random* component, which refers to the probability distribution of the response variable. The assumption is usually made that the dataset consists of a random sample of *independent* observations (Agresti, 2002; Hutcheson and Sofroniou, 1999). The probability distribution depends on the nature of the response variable, with possible distributions coming from the exponential family and including the Normal, Poisson, Binomial and Gamma distributions, for example (Agresti, 2002; McCullagh and Nelder, 1989). An assumption about the nature of the random component is made by adopting a certain probability structure for the model, with appropriate distributions for given response types well defined for the user within the literature (Hutcheson and Sofroniou, 1999). For example, continuous responses, such as age at first marriage, are associated with the Normal distribution; count responses, such as number of children ever born, with a Poission distribution; and, response variables that measure a binary outcome, such as whether or not someone is married, with the Binomial distribution.

The second component is the *systematic* component (Nelder and Wedderburn, 1972), which refers to the *fixed* structure of the explanatory variables. This structure often takes a linear form, as Hutcheson and Sofroniou (1999, p.3) show in Equation 4.1, where η represents the linear predictor, $x_1, x_2, ..., x_j$ the explanatory variables, $\beta_1, \beta_2, ..., \beta_j$ the coefficients and α the value of η when all x variables are equal to zero.

$$\eta_i = \alpha + \beta_1 x_1 + \beta_2 x_2, ..., \beta_j x_j \tag{4.1}$$

It is this formulation of a linear predictor that allows the approaches of parameter estimation that are usually associated with classical linear regression, such as OLS and analysis of variance, to be extended to other models within the GLM framework (Agresti, 2002; Hutcheson and Sofroniou, 1999). The values of the explanatory variables of the systematic component are modelled to explain the variation in the means of the random variable, which in turn represents the response variable. Any variation that is unaccounted for by the explanatory variables is considered to be due to error in accordance with the chosen probability distribution (Agresti, 2002; Hutcheson and Sofroniou, 1999).

The random and systematic components are not always directly related, which creates the necessity for the third *link function* component to characterise the relationship between the two (Agresti, 2002; Hutcheson and Sofroniou, 1999). The role of the link function is illustrated in Equation 4.2.

$$g(\mu_i) = \eta_i \tag{4.2}$$

where g is the link function, μ_i the random component and η_i the linear component. The link function "...converts the linear predictor into a series of expected values corresponding to the original response variable" (Hutcheson and Sofroniou, 1999, p.4). As with the probability distribution, the choice of an appropriate link function is usually determined by the data type and examination of the data. In the simplest case of linear regression (where the response variable is continuous), the link function is the *identity link*, $g(\mu) = \mu$, which gives a linear model for the mean, with the random and systematic components directly related, with $\eta_i = \mu_i$ (Agresti, 2002).

GLM models are fitted using Maximum Likelihood Estimation (MLE) and Iterative Weighted Least Squares (IWLS) (McCullagh and Nelder, 1989). The ML estimates are calculated by maximising the *likelihood function*, which assesses the different likelihoods of obtaining the current sample given different sets of parameter values for the model (Long and Freese, 2006). The model parameters derived from the MLE are those which are most likely (i.e. have the 'maximum likelihood') to generate the data in the given sample, if the assumptions of the model hold (Long and Freese, 2006; Agresti, 2002). Agresti (2002) suggests that MLE is often chosen because of its properties, which he outlines as having large sample normal distributions, asymptotic consistency, convergence to the parameter with increases in sample size and asymptotic efficiency. The large sample standard er-

rors produced are equivalent to those obtained from other estimation methods[1] (Long and Freese, 2006; Hutcheson and Sofroniou, 1999). The user does not need to be proficient in the application of these statistical techniques, however, to fit these regression models, as most standard statistical computer programmes now include such models.

4.2.2 Logistic regression

In Chapter 5, a series of regression models are fitted for different sub-groups to examine the relationships between migration characteristics and partnership status, whilst in Chapter 6, regression models are fitted to explore the relationship between parent status and migration characteristics. For all of these models, the response variables are binary outcomes. In the first case, whether or not an individual is partnered, and in the second, whether or not they have one or more children.

When the response variable is dichotomous, logistic regression provides a suitable methodology for fitting regression models to the data (Hosmer and Lemeshow, 2000). The error of the random component in logistic regression is usually represented by the binomial distribution, whilst the systematic component is the same as that in linear regression. The inclusion of discrete or continuous covariates is possible (Hutcheson and Sofroniou, 1999). The *logit* (log odds) link function is used to relate the systematic and random components together (Hutcheson and Sofroniou, 1999).

In the simplest case where there is only one explanatory variable, the regression equation for any GLM refers to the expected value of the outcome variable, Y, given the particular value of the explanatory variable x. This is often expressed as $E(Y|x)$, which literally translates as the expectation of Y given x, and is known as the *conditional mean*. In the case of linear regression, where the systematic and random components of the model are directly related, the regression equation can be formulated as (adapted from Hosmer and Lemeshow, 2000, p.5):

$$E(Y|x) = \alpha + \beta_1 x_1 \tag{4.3}$$

In the case of logistic regression, $\pi(x)$ is often used to refer to the conditional mean of Y given x. Within the logistic model, $\pi(x) = P(Y = 1|X = x) = 1 - P(Y =$

[1]More detailed discussions of Maximum Likelihood Estimation and Iterative Weighted Least Squares can be found in Agresti (2002), McCullagh and Nelder (1989) and Nelder and Wedderburn (1972).

$0|X = x)$ (Agresti, 2002, p.166), with $\pi(x)$ equal to the probability of the outcome variable being a 'success' given the observed explanatory variable(s) value(s). The terminology of success and failure with reference to the outcome variable in logistic regression refers simply to the presence, $Y = 1$, or absence, $Y = 0$, of the modelled outcome of interest. The logistic regression model used here can be expressed as (adapted from Agresti, 2002, p.166):

$$\pi(x) = \frac{\exp(\alpha + \beta_1 x_1)}{1 + \exp(\alpha + \beta_1 x_1)} \tag{4.4}$$

The logit link function is then applied to give the linear predictor (adapted from Agresti, 2002, p.166):

$$\text{logit}[\pi(x)] = \log \frac{\pi(x)}{1 - \pi(x)} = \alpha + \beta_1 x_1 \tag{4.5}$$

where

$$\frac{\pi(x)}{1 - \pi(x)} \tag{4.6}$$

equates to the odds of success. The assumption is made that $\text{logit}[\pi(x)]$ is linearly related to the systematic component.

In the examples above, the case of the logistic model with one explanatory variable is described, but this is easily extended to include multiple variables, as follows:

$$\text{logit}[\pi(x)] = \alpha + \beta_1 x_1 + \beta_2 x_2 + ... + \beta_j x_j \tag{4.7}$$

This type of multiple logistic regression model is used for the analyses presented in Chapters 5 and 6.

4.2.3 Model selection

In this thesis, logistic regression models are fitted using the *Stata* statistical software package[2]. Manual stepwise, forward selection is used to test variables for inclusion within the model. In this approach, the null model is started with and variables are tested for inclusion in the model, and retained within the model if statistically significant. However, the stepwise element means that variables that

[2]Version 10 of Stata was used. More information about the Stata software can be found on its website: `http://www.stata.com/`.

are initially included can be later removed from the model if they are found to no longer be statistically significant after the addition of subsequent variables. The variables tested for inclusion in the model are identified on theoretical grounds for their relevance to the research questions, and are described in Section 3.4. Where there are modifications to these variables, such as collapsing of categories for maintaining sufficient sample sizes, this is described in the relevant analysis section.

In the models presented within this thesis, the process of model building is shown in stages, considering the importance of different groups of variables for the outcome of interest and for mediating the relationship between existing variables included in the model with the outcome variable, whilst final models test for two-way interaction terms between the main effects retained within the model. Testing for two-way interaction terms allows investigation of whether a particular variable relates to the response variable in different ways amongst sub-groups of another variable.

Weights are applied to the logistic model, using the 'pweight' command within Stata[3]. Where weighted analyses are conducted, it is not appropriate to use the likelihood ratio test to test the significance of variables included in the model (Long and Freese, 2006). The adjusted Wald test[4] is instead used to test the statistical significance of specific parameters included in the model. The Wald test tests the null hypothesis that the effects of specified variables are simultaneously equal to zero in the population. Main effects and two-way interaction terms are included within the models if they are found to be statistically significant at the 5% significance level.

4.2.4 Interpretation

Whilst logistic regression is fitted on the logit scale, it is possible to interpret the results on different scales. The coefficients provided by Stata are the log of the odds of success, but odds ratios and predicted probabilities are generally preferred for interpretation because they allow for more meaningful interpretation than do changes in the log-odds (Long and Freese, 2006). In this thesis, both odds ratios and predicted probabilities are used to interpret the results. These two methods of interpretation are discussed below.

An extension of Equation 4.4 for the case of multiple logistic regression shows that predicted probabilities of success can be obtained using:

[3]Refer to Section 3.2 for an overview of the weights provided in the Labour Force Survey.

[4]These are computed using the 'test' command in stata. The Wald tests are the adjusted Wald test, which are used by default in stata when weights have been applied within the regression model.

$$\pi(\mathbf{x}) = \frac{\exp(\alpha + \beta_1 x_1 + \beta_2 x_2 + ... + \beta_p x_p)}{1 + \exp(\alpha + \beta_1 x_1 + \beta_2 x_2 + ... + \beta_p x_p)} \tag{4.8}$$

An example can be given, using the coefficients provided in Model 1 of Table 6.2, whereby the probability of being a parent for a partnered female aged 25-29 years, who was born in Asia and arrived to the UK within the past five years (at the time of survey) is calculated as:

$$\pi(\mathbf{x}) = \frac{\exp(-0.471 + 0.400 + 0.130)}{1 + \exp(-0.471 + 0.400 + 0.130)} = 0.51$$

Whilst for a partnered female, aged 25-29 years, who was born in Europe and arrived to the UK within the past five years (at the time of survey), the predicted probability of being a parent is:

$$\pi(\mathbf{x}) = \frac{\exp(-0.471 + 0.400 - 0.784)}{1 + \exp(-0.471 + 0.400 - 0.784)} = 0.30$$

Thus, we would interpret that the probability of being a parent amongst partnered females, aged 25-29 years, who have been resident in the UK for five years or less at the time of survey, is higher for those born in Asia than it is for those born in Europe.

Recall from Equation 4.6 that the odds of success are the probability of success divided by the probability of non-success. Odds ratios then, refer to the odds of success for one group divided by the odds of success for the comparison group. Odds ratios can be obtained from regression output by taking the exponential of the coefficient (e^{β}), which gives the odds ratio for the group to whom the coefficient corresponds in comparison to the reference category of that variable, whilst the effects of all other variables are assumed to be held constant. An example of interpretation using odds ratios can be given, again using the coefficients from Model 1 of Table 6.2. The odds of being a parent for an individual aged 30-34 years are 3.72 ($e^{\beta} = e^{1.315}$) times greater than for an individual aged 20-24 years (reference group), holding all other variables constant[5].

The odds ratios are multiplicative, with negative effects bound between 0 and 1, and positive effects greater than 1. Thus, a positive effect of 2 is comparable in magnitude to a negative effect of 0.5 (Long and Freese, 2006). In order that effects are compared on a consistent scale, positive effects are interpreted within this thesis. When odds ratios refer to negative effects, the positive effect can be

[5]In this case, all variables included within the model are discrete and so are held at their reference category values.

obtained by taking the inverse ($1 \div e^{\beta}$) of the odds ratio to gain the positive effect, which then refers to the odds of non-success. For example, in Model 1 of Table 5.3, the odds of being partnered are 0.72 ($e^{-0.326}$) times smaller for the established Other group in comparison to the UK-born group. However, we could equally interpret that the odds of *not* being partnered are 1.39 ($1 \div 0.72$) times greater for the established Other group, in comparison to those of the UK-born group.

Odds ratios provide useful interpretation for comparing the odds of one sub-group with those of a different sub-group within a variable in relation to the outcome of interest. However, predicted probabilities are preferred for interpretation when there are a number of interaction terms within the model, because it is straight forward to specify the levels of all variables included within the predictor and to examine the probabilities for individuals with various combinations of characteristics. Predicted probabilities range from 0 to 1, with higher values indicating greater probabilities of success for the outcome of interest.

Throughout this thesis, main effects models are interpreted using odds ratios to describe relationships of interest, whilst predicted probabilities are used to more fully interpret final selected models which include two-way interactions. For this reason, the log-odds will be presented in the regression output tables, enabling the reader to see the values used for the calculation of both the odds ratios and predicted probabilities.

4.3 Summary

In Chapters 5 and 6, a number of binomial logistic regression models are fitted for different sub-groups to estimate the probability of being partnered and being a parent. These models are used to explore the relationships between partnership and parent status with timing of migration and between recent migrant groups. Differences in level of education and employment status are also controlled for and their role considered for partnership status and parent status, given the differences in the types of migration undertaken by recent A8 and South Asian migrants.

Chapter 5

Partnership status

5.1 Introduction

In this chapter, the partnership patterns of recent migrants to the UK are explored. Recall from Section 3.4 that the definition of being partnered, used throughout the research, is based on whether or not an individual is currently living with a partner, in a cohabiting or marital union[1].

The analyses of partnership status first compare the recent migrant group with established migrants and the UK-born population, in Section 5.2, which addresses Research Question 1 (Chapter 1, p.3). The aim of these analyses is to consider how the timing of migration and partnership formation are related in the life-course, by comparing groups with different migration trajectories. The analyses refer to hypotheses of migration and family formation, to consider whether the proportions partnered are high due to family formation related migration or whether proportions are low and migration does not appear to be directly related with family formation.

This adds to existing knowledge by providing quantitative analyses of how recent migrants to the UK compare to earlier arrivals and the UK-born population. The analyses differ from existing studies by separating the foreign-born population into two different groups, depending on their duration of residence in the UK, which allows greater consideration of the importance of timing of migration in relation to partnership patterns.

In Section 5.3, the partnership status of the recent migrant group is explored in more detail to consider differences according to country of birth and duration of residence in the UK, addressing Research Question 2 (see Chapter 1, p.3) for partnership patterns. The aim of these analyses is to consider intra-group differences amongst recent migrants, comparing the partnership patterns of Bangladeshi, Pakistani and Indian groups with those of the Polish and Other A8 groups. The nature

[1]For discussion of the strengths and limitations of the partnership definition, see Section 3.4.

of the migration flows of these groups to the UK are different, but all of the groups feature in the most common countries of birth for non-UK born individuals having live births in the UK. These analyses explore which sub-groups are partnered, and therefore at greater risk of childbearing, to consider the different migration strategies of these groups, and which appear to be most closely related to family formation events.

This adds to existing knowledge by providing detailed analyses of the partnership types of different recent migrant groups and allows insight into how these are related to education and economic activity characteristics. For the South Asian groups, these analyses provide evidence for the most recent inflows of migrants to the UK, allowing consideration of whether existing trends in immigration from these countries are changing. For the Polish and Other A8 groups considered, these analyses provide some of the first quantitative evidence of the partnership patterns of these groups in the UK, given that large-scale migration flows from these countries are relatively recent and due to the paucity of appropriate data for such analysis in the UK. This provides an important complement to emerging qualitative research exploring the family patterns of A8 groups living in the UK (e.g. White, 2011).

After exploring the partnership status of recent migrants in comparison to other groups and then between recent migrant groups, the partnered populations are analysed in more detail by exploring the characteristics of their partners, in Section 5.4. The analyses in this section address with whom migrants are partnering, with regards to whether their partners are also foreign-born or UK-born individuals. For those with migrant partners, the analyses also consider whether partners arrived before, after or in the same year. These analyses provide further insight into the nature of migration undertaken, with regards to whether individuals appear to be migrating to the UK to partner with UK-born individuals, as we expect to find amongst Pakistani and Bangladeshi groups, or whether they are partnering with other migrants, and how migrant-migrant couples structure their arrival in relation to each other. This answers further Research Question 2 (Chapter 1, p.3) by providing understanding of the similarities and differences in partner types and arrival strategies of recent migrants from different migration systems. These analyses provide some of the first quantitative findings on this topic for recent migrants to the UK.

5.2 Timing of migration

5.2.1 Introduction

In this section, the analyses consider the importance of timing of migration in the life-course for partnership patterns by comparing recent migrant groups with earlier arrivals and UK-born individuals. For example, it is of interest to see whether migration appears to be associated with being in a partnership for these groups or if alternatively, living with a partner is less common for individuals who have recently migrated. It is also of interest whether being partnered is associated with particular characteristics, reflecting different types of migration undertaken.

Recall from Section 3.4 that recent migrants are the foreign-born population who have been resident in the UK for five years or less at the time of survey, whilst established migrants are foreign-born individuals who have been resident for six or more years at the time of survey. Whilst the aim here is to focus on timing of migration, the recent and established groups are further distinguished by region of birth. The groups are separated according to whether they were born in Asia, Europe or all 'Other' regions to control for differences arising from the compositional change in flows to the UK experienced in the last decade (see Section 3.4 for more detail on the migrant status variable).

In Section 5.2.2 the samples used for analysis are described, along with exploratory analyses of the characteristics of the different groups and how these relate to partnership status. Multivariate analyses, using logistic regression to predict the probability of being partnered, are presented separately for females in Section 5.2.3 and for males in Section 5.2.4. The findings from across these three sections are compared and summarised in Section 5.2.5.

5.2.2 Exploratory analyses

There are 83,641 females and 74,895 males aged 20-34 years within the sample. The covariates analysed here are: age at survey; duration of residence and birth region (migrant status); years of education; and, economic activity. In Table 5.1 the distributions of age, years of education and economic activity are shown for each of the different migrant groups.

Table 5.1 highlights the young age structure of recent migrants, with higher proportions at younger ages in comparison to established and UK-born groups, for females and males. Amongst the recent migrants, those born in Europe have the youngest age structure. Amongst all groups, except for the UK-born, the most

Table 5.1: Weighted percentages to show the distribution of key characteristics, by duration of residence in the UK (years) and birth region

	UK-born	**≤5:Europe**	**≤5:Asia**	**≤5:Other**	**≥6:Europe**	**≥6:Asia**	**≥6:Other**
Females:							
Age at survey (years):							
20-24	32.3	36.8	31.1	27.1	18.8	17.8	19.4
25-29	31.7	41.1	38.8	44.5	32.7	32.7	30.1
30-34	35.9	22.1	30.1	28.4	48.5	49.5	50.5
Total	100	100	100	100	100	100	100
Years of education:							
<11	5.5	4.7	10.2	6.6	7.4	12.4	6.1
11-13	57.8	23.6	23.2	31.4	39.1	40.2	37.8
≥14	36.7	71.7	66.7	62.0	53.5	47.4	56.1
Total	100	100	100	100	100	100	100
Economic activity:							
Employed	72.9	68.0	36.3	63.8	68.8	44.1	65.2
Unemployed	4.0	5.3	6.4	5.4	4.5	4.6	5.7
Inactive	18.0	16.3	40.4	21.4	21.5	44.8	20.6
Full-time student	5.1	10.4	16.9	9.4	5.1	6.4	8.5
Total	100	100	100	100	100	100	100
Males:							
Age at survey (years):							
20-24	33.1	31.3	28.7	25.6	21.1	21.4	22.1
25-29	31.3	43.1	41.1	42.6	33.0	31.2	30.3
30-34	35.6	25.7	30.2	31.8	45.9	47.4	47.6
Total	100	100	100	100	100	100	100
Years of education:							
<11	4.7	5.3	9.4	6.1	8.2	9.7	4.8
11-13	60.0	27.7	18.4	30.3	42.7	35.5	35.0
≥14	35.3	66.9	72.2	63.6	49.1	54.8	60.3
Total	100	100	100	100	100	100	100
Economic activity:							
Employed	83.3	81.4	63.4	74.2	83.8	75.9	77.9
Unemployed	6.3	4.5	5.8	6.9	6.2	8.0	9.2
Inactive	5.3	3.9	8.2	6.0	5.3	6.8	4.5
Full-time student	5.1	10.2	22.6	12.9	4.7	9.3	8.4
Total	100	100	100	100	100	100	100

Source: UK Labour Force Survey, April-June Quarters 2001-2009;
n=83,641 females; n=74,895 males.

common number of years of education is 14+, with the recent migrant groups having higher proportions with the highest educational level in comparison to established migrants. The Asian born recent and established migrants have the largest minorities with the lowest level of education.

Amongst the European migrants, the most common economic activity status is employed, and the proportions are similar for recent and established migrants of the same sex. For Asian migrants, lower proportions of the recent migrants are in employment in comparison to established migrants. High proportions of the recent and established Asian female migrants are economically inactive. Recent migrants are also found to have higher proportions who are full-time students than the established migrant groups, with the highest proportions across all groups found for recent Asian male and female migrants. The findings for the Asian recent migrant group could reflect marriage migration, and thus high levels of economic inactivity, of young migrants from the Indian sub-continent on the one hand, whilst also reflecting the student migration associated with migrants from East-Asia and the rest of Asia on the other. This is explored further in Section 5.3 where key countries of birth are explored in more detail.

The distributions of age, education and economic activity status, shown in Table 5.1, highlight that there are important differences between recent migrants and other groups, reflecting the selective nature of migration. It is for this reason that it is important to control for such differences when exploring the importance of timing of migration for partnership status and to also consider how these characteristics relate to partnership status and whether they act in the same way across groups.

In Table 5.2, the distribution of the covariates within the female and male samples, and the bivariate associations between these covariates and partnership status, are shown. The distribution of the duration of residence and region of birth variable reflects the compositional change in migration flows that is of interest within this research. Asian born migrants constitute the largest of the established groups, but European born migrants are the largest of the recent groups, for both males and females. This highlights the importance of controlling for birth region when conducting these analyses. The distributions of the other covariates are largely as expected, with the clear trend emerging that economic inactivity is prevalent for females but less so for males.

All bivariate associations are found to be statistically significant at the 0.1% significance level, using Pearson chi-square tests. The bivariate associations suggest that: increasing proportions are partnered at older ages; for males education is negatively associated with the proportions partnered but the relationship is less

Table 5.2: Distribution of key characteristics and percentages who are partnered for females and males

	Females		Males	
	% Partnered[a]	*(Total n)*[b]	% Partnered	*(Total n)*
Age at survey (years):				
20-24	32.4	*(24,484)*	18.2	*(23,321)*
25-29	61.9	*(27,169)*	50.2	*(23,587)*
30-34	72.5	*(31,988)*	69.0	*(27,987)*
Duration of residence (years) & region of birth:				
UK-born	55.0	*(71,709)*	46.2	*(64,794)*
≥6:Europe	63.5	*(1,939)*	54.9	*(1,480)*
≥6:Asia	71.9	*(2,066)*	56.9	*(1,711)*
≥6:Other	53.2	*(1,853)*	48.3	*(1,482)*
≤5:Europe	64.5	*(2,481)*	48.3	*(2,237)*
≤5:Asia	72.8	*(1,812)*	43.2	*(1,753)*
≤5:Other	59.7	*(1,781)*	49.1	*(1,438)*
Years of education:				
<11	53.3	*(5,197)*	57.0	*(3,873)*
11-13	59.5	*(46,465)*	49.7	*(42,900)*
≥14	52.9	*(31,979)*	41.2	*(28,122)*
Economic activity:				
Employed	59.2	*(58,291)*	51.9	*(61,967)*
Unemployed	40.5	*(3,522)*	28.6	*(4,676)*
Inactive	61.2	*(17,431)*	31.0	*(4,141)*
Full-time student	18.1	*(4,397)*	8.8	*(4,111)*

Source: UK Labour Force Survey, April-June Quarters 2001-2009;
n=83,641 females; n=74,895 males.
[a] Weighted percentages. [b] Unweighted totals for each category.
For each sub-sample, Pearson chi-square tests of association find each variable to be statistically significantly associated with partner status at the 0.1% significance level ($p<0.001$).

clear for females; for males and females the proportions partnered are very low amongst full-time students, whilst they are high for those who are employed; and, for females the proportions partnered are particularly high amongst the economically inactive. In terms of migrant status, for females the proportions partnered are very close for recent and established groups, whilst for males, the proportions partnered are lower amongst recent migrants than amongst established migrants.

The findings from the bivariate analyses should be treated with caution as it is more appropriate to analyse these relationships within a multivariate framework, where the effects of other variables can be controlled for, particularly given the different distributions of covariates found across migrant groups in Table 5.1. Multivariate analyses are presented next in Sections 5.2.3 and 5.2.4, for females and males respectively.

5.2.3 Females

Table 5.3 shows the logistic regression results for the female sample. Model 1 includes age at survey and migrant status, Model 2 adds years of education and economic activity status to Model 1 and Model 3 includes statistically significant two-way interaction terms between all main effects included in Model 2.

In Model 1, the relationship between age at survey and the odds ratios of being partnered are as expected with increasing odds at older ages. For example, the 25-29 years group have 3.38 ($e^{1.219}$) greater odds and the 30-34 years group have 5.60 greater odds of being partnered, than those aged 20-24 years. When controlling for age, all groups, except for the established Other group, have higher odds of being partnered than the UK-born. In terms of the timing of migration, the odds of being partnered are greater for the recent migrants than for the established migrants from the same birth regions. In comparison to the UK-born group, the odds of being partnered are 1.78 times higher for the recent European migrants and 1.16 times higher for the established European migrants. The corresponding odds for those born in Asia are 2.45 times greater for the recent group and 1.74 times greater for the established group. The differences in odds for recent and established migrants are all found to be statistically significant at the 0.1% significance level[2].

In Model 2 (Table 5.3), the years of education and economic activity variables are introduced. The results for years of education are surprising because a negative

[2]It is possible to test whether there are statistically significant differences between the different levels of a variable by refitting the regression model with different reference categories. Model 1 was refitted with each of the recent migrant groups as the reference category for the migrant status variable to detect the statistical significance of differences between established and recent migrant groups.

Table 5.3: Log-odds of being partnered: Females aged 20-34 years

	(1) Demographics		(2) Education & Economic Activity		(3) Interactions	
Constant	-0.794^{***}	(0.014)	-0.902^{***}	(0.036)	-0.262^{***}	(0.072)
Age at survey (years)						
(ref: 20-24)						
25-29	1.219^{***}	(0.019)	1.103^{***}	(0.019)	0.670^{***}	(0.085)
30-34	1.723^{***}	(0.019)	1.584^{***}	(0.019)	1.032^{***}	(0.081)
Duration of residence (years) & birth region						
(ref: UK-born)						
≤5:Europe	0.576^{***}	(0.047)	0.735^{***}	(0.049)	0.878^{***}	(0.081)
≤5:Asia	0.894^{***}	(0.059)	1.244^{***}	(0.061)	1.040^{***}	(0.124)
≤5:Other	0.183^{***}	(0.053)	0.324^{***}	(0.055)	0.257^{***}	(0.072)
≥6:Europe	0.146^{**}	(0.050)	0.221^{***}	(0.052)	0.126^{*}	(0.060)
≥6:Asia	0.553^{***}	(0.051)	0.686^{***}	(0.053)	0.703^{***}	(0.185)
≥6:Other	-0.326^{***}	(0.049)	-0.214^{***}	(0.051)	-0.270^{***}	(0.052)
Years of education						
(ref: <11)						
11-13			0.376^{***}	(0.033)	-0.158^{*}	(0.073)
14+			0.191^{***}	(0.034)	-0.799^{***}	(0.075)
Economic activity status						
(ref: Employed)						
Unemployed			-0.663^{***}	(0.039)	-0.658^{***}	(0.050)
Inactive			-0.042^{*}	(0.020)	-0.492^{***}	(0.070)
Full-time (FT) student			-1.484^{***}	(0.044)	-1.465^{***}	(0.068)
Age*Duration of residence & birth region						
25-29*≤5:Europe					-0.586^{***}	(0.107)
25-29*≤5:Asia					-0.555^{***}	(0.151)
25-29*≥6:Asia					0.310^{**}	(0.119)
30-34*≤5:Europe					-0.786^{***}	(0.133)
30-34*≤5:Asia					-0.968^{***}	(0.164)
30-34*≤5:Other					-0.564^{***}	(0.116)
Age*Years of education						
25-29*11-13					0.336^{***}	(0.086)
25-29*14+					0.845^{***}	(0.090)
30-34*11-13					0.410^{***}	(0.081)
30-34*14+					1.200^{***}	(0.086)
Age*Economic activity status						
25-29*Inactive					-0.344^{***}	(0.051)
25-29*FT student					0.367^{***}	(0.105)
30-34*Unemployed					-0.260^{**}	(0.082)
30-34*Inactive					-0.365^{***}	(0.049)
30-34*FT student					0.507^{***}	(0.117)
Duration of residence & birth region*Years of education						
≥6:Asia*11-13					-0.414^{*}	(0.182)
≥6:Asia*14+					-0.682^{***}	(0.190)
Duration of residence & birth region*Economic activity status						
≤5:Europe*Unemployed					0.951^{***}	(0.203)
≤5:Europe*Inactive					1.356^{***}	(0.159)
≤5:Asia*Unemployed					1.081^{***}	(0.243)
≤5:Asia*Inactive					1.703^{***}	(0.152)
≤5:Other*Unemployed					0.859^{***}	(0.222)
≤5:Other*Inactive					0.591^{***}	(0.128)
≥6:Europe*Inactive					0.255^{*}	(0.124)
≥6:Asia*Inactive					1.005^{***}	(0.133)
Years of education*Economic activity status						
11-13*Inactive					0.572^{***}	(0.065)
14+*Inactive					0.923^{***}	(0.074)
Observations	83,641		83,641		83,641	
Pseudo R^2	0.091		0.110		0.122	

Source: UK Labour Force Survey, April-June Quarters 2001-2009
Robust standard errors in parentheses
Level of statistical significance: * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

association between the odds of being partnered and years of education would usually be expected. Instead, it is found that the odds are lowest for the <11 years of education group, with 1.46 times greater odds of being partnered for the 11-13 years group and 1.21 greater odds for the 14+ years group. Thus, the highest odds are found for those with the middle level of education (11-13 years).

Similarly, the results for the economic activity status are not as expected. The employed group have the highest odds of being partnered of all economic activity groups. Therefore, calculating the inverse of the odds ($1 \div e^{\beta}$) for the economic activity status categories shows that the odds of *not* being partnered are 1.94, 1.04 and 4.41 times greater for the unemployed, economically inactive and full-time students, respectively, in comparison to the employed group. Whilst it is expected that the odds for full-time students would be low, it would also have been expected that economically inactive females would have high odds due to family formation related migration.

The relationships between migrant groupings remain the same in Model 2 as found in Model 1. All groups, except for the established Other have higher odds of being partnered than the UK-born, and recent migrants have higher odds of being partnered than established migrants from the same birth region. However, the coefficients for the migrant status variable do not decrease in Model 2, as would be expected if controlling for education and economic activity had explained some of the observed differences between migrant groups. The coefficients for all migrant groups, except for the established Other group, become larger and either remain of the same or increase in statistical significance in Model 2. This suggests that these variables may be correlated with migrant status for particular sub-groups, emphasising the importance of checking for interaction effects for potentially explaining the unexpected patterns observed for the education and economic activity variables in Model 2.

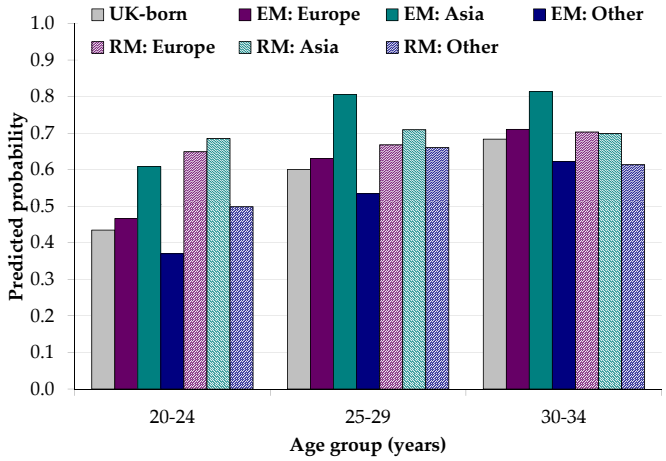
In Model 3, the large number of statistically significant two-way interaction effects reveal the complexities in the relationship between migrant status and the probability of being partnered. The years of education and economic activity variables now act as expected, but there are important differences between groups, as will be discussed below. The effects from the model are interpreted using predicted probabilities, calculated using Equation 4.8. Predicted probabilities of being partnered, by years of education levels, are shown in Figure 5.1, whilst holding economic activity status at the employed level. The predicted probabilities of being partnered, by economic activity status levels are then shown in Figure 5.2, whilst holding the years of education variable constant at less than 11 years of education.

A clear pattern emerges at ages 20-24 years, across all levels of education and

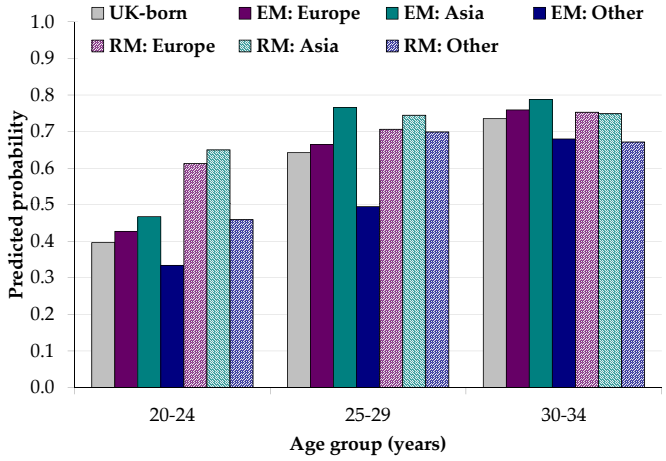
economic activity statuses, with recent migrants having higher probabilities of being partnered than the established migrant groups from the same regions of birth. These differences are more pronounced for some groups than for others. For those who are employed with less than 11 years of education (shown in Figures 5.1(a) and 5.2(a)), the probabilities are very high for the established Asian group also. The difference is also smaller amongst recent and established Asian migrants who are economically inactive, with very high probabilities of being partnered at ages 20-24 years for both of these groups. Finally, the differences are also small between all recent and established groups for those who are full-time students (Figure 5.2(d)) due to very low probabilities for all groups at these ages.

The higher probabilities for the recent migrant group at ages 20-24 years may be explained by the fact that the established migrants aged 20-24 years would have migrated when they were aged 18 years or younger (since they have been resident in the UK for 6 years or more at the time of survey). Therefore, it is more likely for some of the established migrants aged 20-24 years to have migrated to the UK with their parents or family and to potentially still be living with their relatives, displaying similar patterns to the UK-born, with later ages at leaving the parental home (e.g. Stone et al., 2011). The similar probabilities of being partnered found for established migrants and UK-born individuals, aged 20-24 years, with 11-13 and 14+ years of education fit with this idea. However, it is also expected that the established migrant group aged 20-24 years could represent individuals who migrated at the end of their teenage years for marriage migration, such as is the case with Bangladeshi and Pakistani migrants. This idea is also supported by the high probabilities of being partnered seen for the established Asian migrants with less than 11 years of education in Figure 5.1(a)). An examination of age at arrival to the UK for the established Asian females aged 20-24 years at survey, who are partnered and have $<$11 years of education, reveals that around 50% of these individuals arrived between the ages of 15-18 years. Thus, it seems likely for these individuals that their moves could have been related to marriage migration. However, for the other half of the group it seems that whilst these individuals arrived to the UK at younger ages, they also left education and formed partnerships early, reflecting the early union formation seen for certain Asian groups.

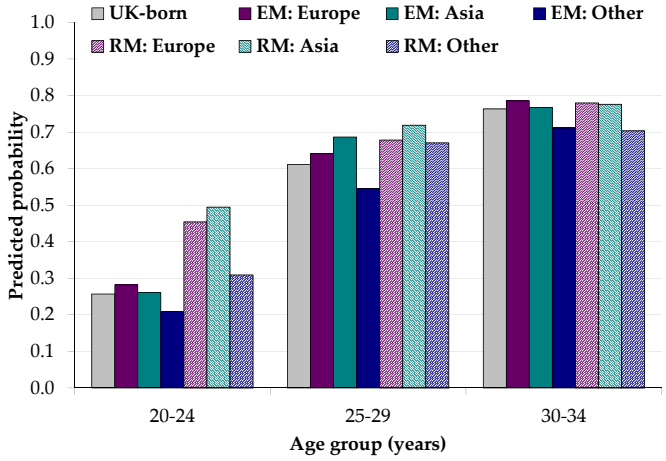
At ages 25-29 years, recent migrants from Europe continue to have higher probabilities than established migrants from Europe, across all educational and economic activity levels. However, the differences are small for all educational levels, the employed and full-time student groups. For the unemployed and inactive groups, the probabilities of being partnered are substantially higher for the recent European migrants in comparison to the established European migrants. For the



(a) <11 years of education



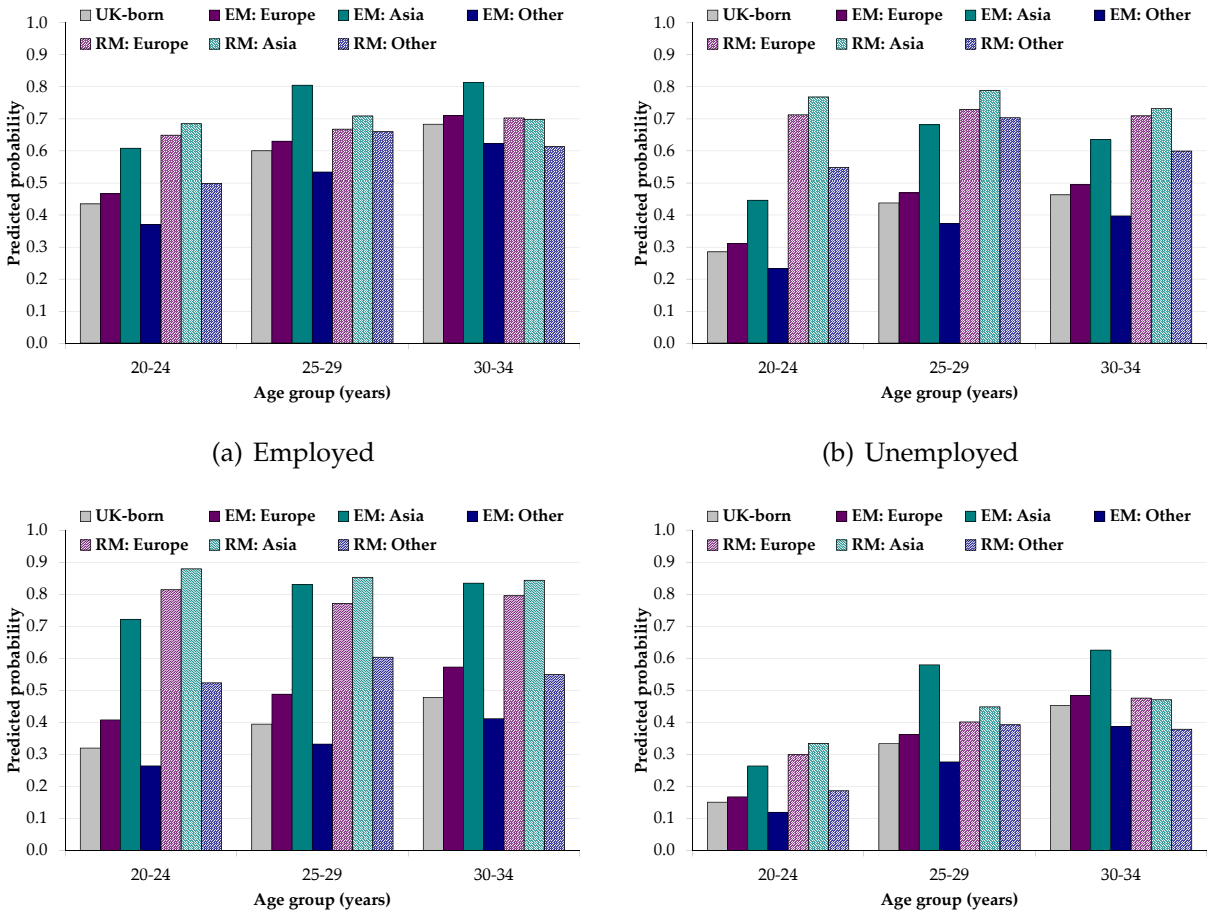
(b) 11-13 years of education



(c) ≥14 years of education

EM = Established migrant (resident in the UK ≥6 years at time of survey)
RM = Recent migrant (resident in the UK ≤5 years at time of survey)
Predicted probabilities calculated for those who are employed.

Figure 5.1: Predicted probabilities of being partnered for females aged 20-34 years, by years of education and migrant status and birth region



(a) Employed

(b) Unemployed

(c) Inactive

(d) Full-time student

EM = Established migrant (resident in the UK ≥6 years at time of survey); RM = Recent migrant (resident in the UK ≤5 years at time of survey)
Predicted probabilities calculated for those with <11 years of education.

Figure 5.2: Predicted probabilities of being partnered for females aged 20-34 years, by economic activity status and migrant status and birth region

Asian migrant groups aged 25-29 years, the differences between recent and established migrants vary across sub-groups. For those with <11 or 11-13 years of education, the probabilities of being partnered are highest for the established group, and this is particularly pronounced at the lowest educational level, highlighted by the interaction effects for the established Asian group with higher educational levels. Whilst for the most highly educated group, with 14+ years of education, partnership probabilities are highest for the recent migrant group. For the employed and full-time student groups, probabilities of being partnered are higher for the established Asian migrants than for the recent Asian migrants, but the reverse is found for those who are unemployed and inactive.

At ages 30-34 years, the probabilities of being partnered are comparable for recent and established European migrants across all educational levels and for those who are employed or full-time students. For individuals who are unemployed or economically inactive, the recent European migrants have higher partnership probabilities than the established European migrants, as found for the 25-29 years age group also. The recent and established Asian groups have comparable partnership probabilities for those aged 30-34 years with 14+ years of education, and higher probabilities for the established Asian group at lower educational levels. The findings for economic activity amongst Asian migrants aged 30-34 years are similar to those for ages 25-29 years, with established migrants having the highest probabilities amongst the employed and full-time student groups and the recent migrants having the highest probabilities amongst those who are unemployed. A different pattern is found for economically inactive Asian migrants at ages 30-34 years, in comparison to the 25-29 years group, with comparable probabilities for both recent and established migrants at these older ages.

Whilst the focus of the discussion here has been on the differences between recent and established migrants, because the intention is to consider how the partnership patterns of these groups compare, it is also important to briefly discuss the other interaction effects that are included in the model, whilst holding all other effects constant. The interaction between age and years of education is as expected with the negative effect of higher education decreasing at older ages, due to the opportunity to have both pursued higher levels of education and to have had greater opportunity for partnership formation following the exit from education. Economic inactivity for those with higher levels of education is also found to be positively associated with the probability of being partnered, most likely reflecting family formation following exit from education. The negative effect of being a full-time student is also found to lessen with increases in age. By contrast, the positive effect on the probability of being partnered of economic inactivity decreases with increases in age, suggesting that economic inactivity at younger ages is particularly

associated with family formation.

The aims of the analyses in this section are to consider the probabilities of being partnered for the female recent migrant groups and how these compare to those of other groups with different migration experiences. Overall, the findings suggest that the probability of being partnered is very high for all recent migrant females, except for those who are full-time students. A comparison of groups across Figures 5.1 and 5.2 shows that the Asian and European migrant groups always have comparable or, more often, higher partnership probabilities than the UK-born, regardless of educational level or economic activity status. For the Other recent migrant group, the pattern is more mixed, potentially reflecting the heterogeneous nature of this grouping, but also that migration may not be so directly related with being in a partnership for this group. Due to the heterogeneous nature of the Other group, they are included in analyses for comparison, but detailed interpretation of their patterns is avoided.

The high probabilities of being partnered found for the recent Asian and European migrants suggest the highly selected nature of this group, as, the high probabilities of being partnered remain after controlling for education and economic activity. This is particularly exemplified for those in the youngest age group where the probabilities of the recent migrant groups are substantially higher than those of all other groups. This may reflect the fact that these individuals have migrated at young ages, during adulthood, and therefore by necessity are more likely to have left the parental home (and have the opportunity for living with a partner) than other groups.

For recent European migrants, the high probabilities found across educational and economic activity groups mean that at ages 25-29 and 30-34 years, their partnership probabilities are very similar to those of established migrants of the same ages, except amongst the unemployed and economically inactive. Recent European migrants who are unemployed or inactive have much higher probabilities than comparable established European migrants. These findings suggest that for all recent European migrants, being in a partnership is closely associated with migrating, but particularly so amongst the unemployed and inactive.

For recent Asian migrants, aged 25-29 and 30-34 years, the partnership probabilities are lower than the established group at <11 and 11-13 years of education and amongst employed and full-time student groups. However, this is due to particularly high probabilities for the established Asian groups with these characteristics, rather than low probabilities amongst the recent Asian migrants. For the economically inactive, recent and established Asian migrants have similar predicted probabilities, whilst the probabilities of the recent Asian migrants are the

highest amongst the unemployed.

The recent Asian migrants have similar probabilities of being partnered to the recent European group,with both recent migrant groups having high probabilities of being partnered. This is particularly the case for economically inactive females, which relates to a high proportion of the recent Asian group (Table 5.1), but even for the recent European females, for whom the greatest proportions are employed, the partnership probabilities are above 0.65 for all age groups. It is not possible to identify the timing of union formation within the LFS, but the evidence does not suggest that partnership formation is necessarily delayed as a result of migration for these females. The issue of whether migration is directly associated with union formation, and thus, whether the interrelation of events hypothesis might apply to this scenario, is explored further in Section 5.3, where duration of residence is explored in relation to partnership probabilities, and in Section 5.4, where the migrant status of partners is explored.

Whilst recent migration is associated with high probabilities of being partnered for females, the analyses next explore whether this is also found for males in Section 5.2.4 or whether the relationship between partnership probabilities and recent migration is sex-specific.

5.2.4 Males

The logistic regression results for the male sample are presented in Table 5.4. As for females, Model 1 includes age at survey and migrant status, with Model 2 adding education and economic activity, and Model 3 includes statistically significant two-way interaction effects.

In Model 1, the odds of being partnered are 1.18, 1.15 and 1.26 times greater than those of the UK-born for recent migrants from Europe and established migrants from Europe and Asia, respectively. In contrast to the females, the odds for the recent Asian migrants are lower than for the UK-born and the odds for the recent Other group are not statistically significantly different to the UK-born. The results for Model 1 show that for European and Other migrants, the odds of being partnered are higher for recent migrants than for established migrants, whilst the opposite trend is found for the Asian group. However, when the models are refitted with different reference categories for the migrant status variable, the results show that differences between the recent and established groups is not statistically significant for those born in Europe.

The introduction of education and economic activity in Model 2 results in a

Table 5.4: Log-odds of being partnered: Males aged 20-34 years

	(1) Demographics		(2) Education & Economic Activity		(3) Interactions	
Constant	-1.508^{***}	(0.017)	-0.830^{***}	(0.044)	-0.397^{***}	(0.074)
Age at survey (years)						
(ref: 20-24)						
25-29	1.507^{***}	(0.022)	1.389^{***}	(0.022)	0.977^{***}	(0.097)
30-34	2.303^{***}	(0.022)	2.156^{***}	(0.022)	1.512^{***}	(0.093)
Duration of residence (years) & birth region						
(ref: UK-born)						
≤5:Europe	0.164^{**}	(0.050)	0.294^{***}	(0.052)	0.529^{***}	(0.116)
≤5:Asia	-0.158^{**}	(0.053)	0.179^{**}	(0.058)	-0.049	(0.183)
≤5:Other	0.059	(0.060)	0.284^{***}	(0.062)	-0.385	(0.228)
≥6:Europe	0.142^{*}	(0.059)	0.195^{**}	(0.060)	0.182^{**}	(0.060)
≥6:Asia	0.228^{***}	(0.053)	0.386^{***}	(0.057)	-0.253	(0.171)
≥6:Other	-0.172^{**}	(0.058)	-0.031	(0.060)	-0.042	(0.061)
Years of education						
(ref: <11)						
11-13yrs			-0.352^{***}	(0.042)	-0.805^{***}	(0.076)
14+yrs			-0.624^{***}	(0.043)	-1.284^{***}	(0.081)
Economic activity status						
(ref: Employed)						
Unemployed			-0.849^{***}	(0.038)	-0.388^{***}	(0.067)
Inactive			-1.101^{***}	(0.039)	-0.390^{***}	(0.087)
Full-time (FT) student			-1.581^{***}	(0.058)	-1.690^{***}	(0.098)
Age*Duration of residence & birth region						
25-29*≤5:Europe					-0.462^{***}	(0.117)
25-29*≤5:Asia					-0.383^{**}	(0.118)
25-29*≥6:Asia					0.460^{*}	(0.190)
30-34*≤5:Europe					-0.934^{***}	(0.131)
30-34*≥6:Asia					0.699^{***}	(0.188)
Age*Years of education						
25-29*11-13					0.437^{***}	(0.100)
25-29*14+					0.657^{***}	(0.104)
30-34*11-13					0.656^{***}	(0.095)
30-34*14+					1.024^{***}	(0.100)
Age*Economic activity status						
25-29*Unemployed					-0.473^{***}	(0.088)
25-29*Inactive					-0.665^{***}	(0.105)
25-29*FT student					0.316^{*}	(0.140)
30-34*Unemployed					-0.732^{***}	(0.089)
30-34*Inactive					-0.923^{***}	(0.099)
30-34*FT student					0.418^{*}	(0.165)
Duration of residence & birth region*Years of education						
≤5:Europe*14+					0.249^{*}	(0.100)
≤5:Asia*11-13					0.589^{**}	(0.218)
≤5:Asia*14+					0.399^{*}	(0.188)
≤5:Other*11-13					0.879^{***}	(0.253)
≤5:Other*14+					0.600^{*}	(0.242)
Duration of residence & birth region*Economic activity status						
≤5:Europe*Unemployed					0.839^{***}	(0.210)
≤5:Europe*Inactive					0.719^{***}	(0.215)
≥6:Asia*Unemployed					0.623^{**}	(0.214)
≥6:Asia*Inactive					1.039^{***}	(0.227)
Years of education*Economic activity status						
14+*Unemployed					-0.309^{***}	(0.088)
14+*Inactive					-0.358^{***}	(0.100)
Observations	74,895		74,895		74,895	
Pseudo R^2	0.137		0.163		0.167	

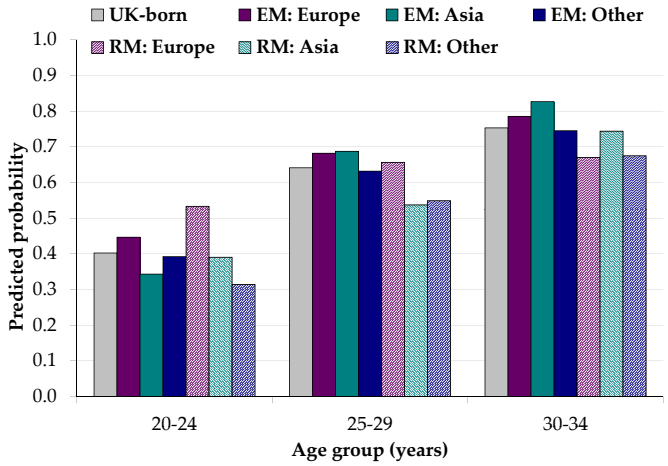
Source: UK Labour Force Survey, April-June Quarters 2001-2009
Robust standard errors in parentheses
Level of statistical significance: * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

change in the pattern observed for migrant status. All groups are now found to have higher odds of being partnered than the UK-born, other than the Other established migrant group for whom there is now no statistically significant difference. The relationships between established and recent migrant groups are the same as found in Model 1, with recent migrants having higher odds of being partnered for the European and Other groups and established migrants having the highest odds amongst Asian groups, with all of these relationships now statistically significant. As was also found for females in the previous section, the migrant status coefficients increase in size and statistical significance in Model 2, except amongst the established Other group, suggesting that education and economic activity are correlated with migrant status.

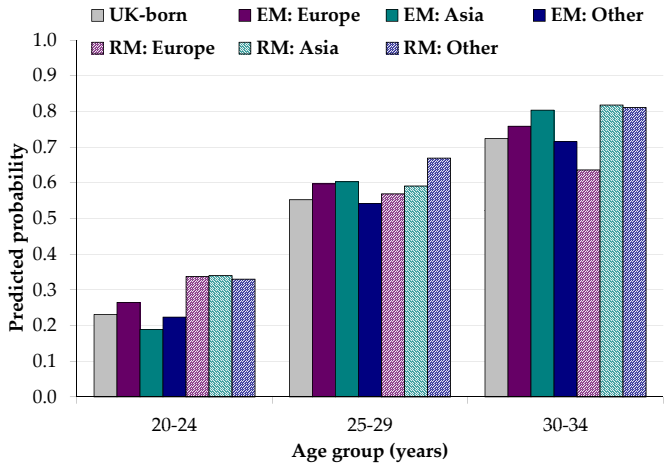
In Model 3, statistically significant two-way interaction effects are found between all main effects. Figure 5.3 illustrates the relationship between education and partnership probabilities for the employed group, whilst Figure 5.4 shows partnership across economic activity levels for those with <11 years of education. The first point to note in observing these figures is that partnership probabilities for the males are not high for all recent migrants, as they are for most female recent migrants.

At ages 20-24 years, recent migrants from Europe and Asia have higher partnership probabilities than established migrants, from the same region, regardless of educational level. This pattern is also found for the female group, and is likely to be due to recent migrants being a selected group who are more likely to have left the parental home at younger ages than other groups, and therefore to be *living* with a partner. However, this trend is not found universally across all economic activity statuses at age 20-24 years, as it was for females. For European migrants the probabilities are highest for recent migrants across all economic activity statuses, but for recent Asian migrants this is found only for the employed and full-time student groups. Thus, for this group being inactive or unemployed does not seem to be associated with migration related to being in a partnership as it is for other groups.

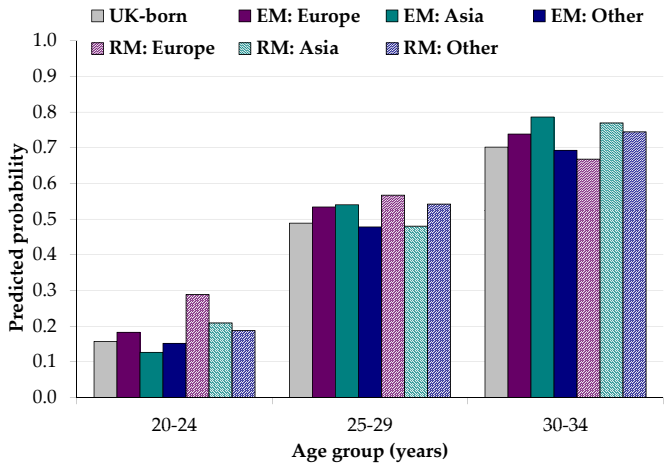
For Asian migrants, at ages 25-29 and 30-34 years, recent migrants have lower partnership probabilities than the established group across all economic activity statuses. The differences are especially large for the unemployed and economically inactive groups, although this is mainly due to the high probabilities of being partnered for established Asian migrants in these groups. The probabilities of being partnered for the recent Asian migrants are lower than for the UK-born at ages 25-29 years, and comparable at ages 30-34 years, for all economic groups. For the recent Asian migrants, no economic activity status appears to be strongly associa-



(a) <11 years of education



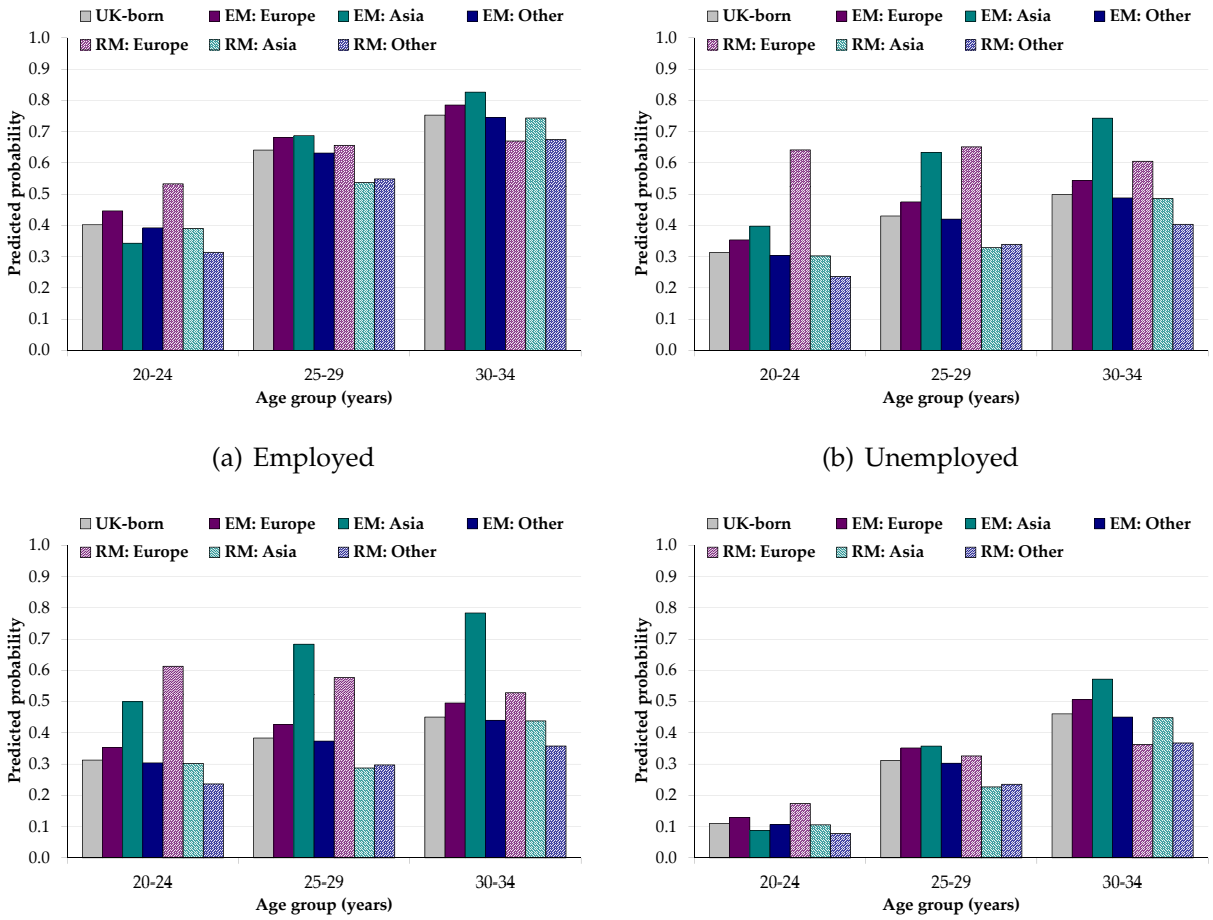
(b) 11-13 years of education



(c) ≥14 years of education

EM = Established migrant (resident in the UK ≥6 years at time of survey)
RM = Recent migrant (resident in the UK ≤5 years at time of survey)
Predicted probabilities calculated for those who are employed.

Figure 5.3: Predicted probabilities of being partnered for males aged 20-34 years, by years of education and migrant status and birth region



(a) Employed

(b) Unemployed

(c) Inactive

(d) Full-time student

EM = Established migrant (resident in the UK ≥6 years at time of survey); RM = Recent migrant (resident in the UK ≤5 years at time of survey)
Predicted probabilities calculated for those with <11 years of education.

Figure 5.4: Predicted probabilities of being partnered for males aged 20-34 years, by economic activity status and migrant status and birth region

ted with being in a partnership, except for those who are employed at older ages, reflecting later entry into partnership amongst recent Asian males.

In Figure 5.3, it can be seen that recent Asian migrants aged 25-29 years have lower partnership probabilities than the established Asian group at all levels of education, whilst at ages 30-34 years this trend persists for those with <11 years of education, but there is little difference at 11-13 and 14+ years of education. Thus, for the less educated Asian migrants, the probabilities are relatively low at ages 25-29 and 30-34 years, but for the more highly educated there appears to be some catch-up at older ages. Partnership probabilities are especially high amongst recent Asian migrants who are more highly educated and migrate at older ages, for those in employment. As seen in Figure 5.4, employment is a key factor for this group with lower probabilities even at older ages for those with other economic activity statuses.

For recent European migrants, their partnership probabilities are close to those of the established European migrants at ages 25-29 years for the employed and full-time student categories, whilst the recent migrants have lower probabilities amongst these groups at ages 30-34 years. For the unemployed and inactive groups, the recent European migrants have higher partnership probabilities than the established Europeans at all ages, but the size of the difference decreases at older ages. Thus, at younger ages the probabilities of being partnered for recent European males are highest amongst the unemployed and inactive, but for those arriving at the oldest ages being employed is associated with higher probabilities.

At ages 25-29 and 30-34 years, recent European migrants have lower partnership probabilities than established European migrants across educational levels, with the only exception found for recent migrants aged 25-29 years with 14+ years of education. For young highly educated, employed recent European males, they appear to be selected into partnership earlier than other groups, with all other groups with 14+ years of education having higher probabilities than, and hence having caught up with, the recent European males at ages 30-34 years.

As with the female model in the previous section, there are a number of other interaction effects that mediate the observed relationships. The negative effects of higher education and being a full-time student are again found to lessen with increases in age. The positive effects of unemployment and economic inactivity are found to decrease with age, whilst this was found only for inactivity amongst the females. A further difference to that found for females is that inactivity and unemployment are not positively associated with partnership probabilities for those with 14+ years of education. This suggests that for highly educated males, economic inactivity is not associated with family formation following an exit from

education, as it appears to be for females.

In terms of the importance of timing of migration and how recent migrants compare to other groups, the findings differ between sub-groups, highlighting the importance of years of education and economic activity status, and how these relate to the nature of migration undertaken. At young ages, there is evidence for a selection effect with the recent migrants having higher partnership probabilities than comparable groups, other than amongst recent Asian migrants who are inactive or unemployed. At ages 25-29 and 30-34 years, established European migrants have higher partnership probabilities than recent European migrants, except amongst the unemployed, economically inactive and the 25-29 years age group with 14+ years of education. Recent Asian migrants aged 25-29 and 30-34 years have lower partnership probabilities than established Asian migrants for all educational levels and economic activity statuses, except for those with 11-13 years of education, where the probabilities are similar for both groups. The lower partnership probabilities of many of the recent migrant groups in comparison to the established migrants suggest that partnership probabilities are lower for individuals who have recently migrated.

In comparison to the UK-born groups, recent European migrants tend to have higher partnership probabilities at ages 20-24 years, comparable probabilities at ages 25-29 years and lower probabilities at 30-34 years. This pattern does not apply for the economically inactive and unemployed, where the recent European migrants have higher probabilities than the UK-born across all age groups. For the recent Asian migrants, their partnership probabilities are lower than those of the UK-born at younger ages and comparable at ages 30-34 years, across all economic activity statuses. This pattern is also found amongst those with the lowest level of education, whilst the recent Asian migrants have higher or comparable probabilities at 11-13 and 14+ years of education.

Whilst the partnership probabilities of the recent migrants are often lower than those of comparable established migrants, the probabilities found for particular recent migrants are still high. For recent Asian migrants, particularly high probabilities are found amongst the older migrants and those who are employed. Meanwhile for full-time students, which constitutes just over one fifth of recent Asian male migrants (Table 5.1), the probabilities are low. For the recent European males, high probabilities are found for the economically inactive and unemployed at younger ages, but these groups combined represent less than 10% of the recent European group. Amongst recent European males who are employed, who represent the largest economic activity status for this group, the partnership probabilities are fairly high at ages 25-29 and 30-34 years. The recent European migrants have ear-

lier entry to partnership than recent Asian males, with peak probabilities at 25-29 years and 30-34 years for each group, respectively.

5.2.5 Discussion

In this section, the aim has been to explore the partnership patterns of recent migrants to the UK in terms of how they compare to those of individuals with different migration experiences and whether recent migrants with particular characteristics, relating to the nature of migration undertaken, are more likely to be partnered than others.

In section 5.2.2, the age, education and employment characteristics of different migrant groups were explored, for females and males aged 20-34 years at the time of survey. The findings showed that recent migrants are typically younger, and more highly educated than established migrants and the UK-born. However, Asian migrants, regardless of their arrival, were also found to have the largest minorities with the lowest level of education. The results with regards to economic activity were found to vary by sex, as would be expected. Around 16.3% of recent European, and 40.4% of the recent Asian female migrants are economically inactive, whilst for males the proportions are far lower. The recent Asian migrant males and females also have sizeable minorities who are full-time students. The vast majority of the recent European males are employed, with over two-thirds of recent European females and just under two-thirds of recent Asian males employed. Thus, for recent European migrants, their migration appears to be closely associated with employment for males and females, but also with not being in employment for a smaller proportion of the females. For recent Asian migrants, migration seems to be associated with employment or study for males, whilst for the females it was found to be associated with economic inactivity, but also employment for around one third and study for a sizeable minority.

In section 5.2.3, logistic regression models were fitted to predict the probability of being partnered for the female sample. The results for the females show that the probabilities of being partnered are high amongst all European and Asian recent migrants. Regardless of economic activity status or years of education, these groups have high partnership probabilities, except for those who are full-time students, but this is particularly the case amongst economically inactive and unemployed females.

In section 5.2.4, the logistic regression results for males were presented, again relating to the probability of being partnered. Amongst recent male migrants, the probabilities were low for the full-time students, as found for females. However,

the probabilities for other recent migrant groups were not always high, in contrast to females. For the European recent migrants, economic inactivity and unemployment are associated with high partnership probabilities, like for females, but this trend does not apply to recent Asian male migrants. For recent Asian male migrants, higher probabilities of being partnered are found at older ages amongst the employed group and those with middle to higher levels of education. For recent European males, the highest probabilities for young groups are found amongst the inactive and unemployed, whilst at older ages they are found amongst the employed group.

The findings from across these sections show that for all females, except full-time students, recent migration is associated with high partnership probabilities. For recent male migrants, this is not found to be the case. The partnership probabilities of the recent male migrants are often lower than those of comparable individuals with different migration experiences. High probabilities are found for the employed groups at older ages for recent migrant males, with earlier entry into partnerships for European males, but higher probabilities at older ages for recent Asian males. An interesting finding that emerges is that within recent migrant groups, probabilities do not differ so greatly by education as they do across economic activity statuses. This is likely related to the fact that highly educated individuals are selected into migration but economic activity may be more closely linked to the nature of migration and have greater current practical implications.

The findings in this section provide an important contribution to current understanding of the partnership patterns of young recent migrants to the UK and how they compare to those of other groups. A sex-specific effect is found with high probabilities of being partnered for all female recent migrants, except full-time students. This finding for females is important because although the nature of migration undertaken is quite different for European and Asian groups[3], it still appears to be associated with high partnership probabilities for both.

In the next sections it is of interest to consider the recent migrant groups in more detail, since the birth region groupings employed in this section are quite heterogeneous. These analyses have provided important insight for recent migrants in comparison to other groups, but next we explore differences *within* the recent migrant group, accounting for key countries of birth and duration of residence in the UK.

[3]Table 5.1 showed that, amongst females, for the recent Asian group, high proportions are economically inactive, whilst for the recent European group, high proportions are employed. Furthermore, most of the recent European group are from EU countries with less migration restrictions than for individuals migrating from Asia.

5.3 Recent migrants

5.3.1 Introduction

The focus of this section is to expand upon the analyses presented in the previous section, by considering intra-group differences amongst recent migrants. Individuals from the Indian subcontinent, for whom migration to the UK has often been closely associated with family formation, are compared to individuals from the A8 countries that joined the EU in May 2004, whose migration is thought to be economically motivated, but for whom there is currently little quantitative evidence regarding their family patterns. The countries of birth considered are Pakistan and Bangladesh, India, Poland and the Other A8 group. This is also interesting because it provides a comparison of the Polish group with the Other A8 countries, because the Polish group is sufficiently large to consider on its own. Breaking down the analyses by country of birth allows consideration of whether these key countries of birth are typical of their regions of birth, or whether important differences were masked by the groupings adopted in the previous section. A further control for duration of residence in the UK is added in these analyses to give better insight into whether partnership probabilities differ according to how long individuals have been resident, since the recent migrants were analysed as a homogeneous group in the last section but could have been resident in the UK from 0-5 years.

In section 5.3.2 the sample characteristics and bivariate associations with partnership status are explored, whilst the logistic regression analyses predicting the probabilities of being partnered are presented for females in Section 5.3.3 and males in Section 5.3.4. Finally, Section 5.3.5 provides a summary of the key findings from these analyses.

5.3.2 Exploratory analyses

The sample sizes for recent migrants, who have been resident in the UK for five years or less at the time of survey, are 6,074 females and 5,428 males. Table 5.5 shows the distribution of the covariates by country of birth, whilst Table 5.6 shows the bivariate associations between covariates and partnership status, for each of these samples.

For females in Table 5.5, important educational differences are found by country of birth. In particular, over two thirds of the Indian group have 14+ years of education, whilst for the Pakistani/Bangladeshi group only 38% do, highlighting the importance of considering these groups separately. In fact, the Indian females

Table 5.5: Weighted percentages to show the distribution of key characteristics, by country of birth for recent migrants

	Poland	Other A8	Pakistan/ Bangladesh	India	Other: Europe	Other: Asia	Other: ROW[a]
Females:							
Age at survey (years):							
20-24	38.3	40.3	48.4	18.9	34.9	31.3	27.1
25-29	44.9	40.8	30.9	47.8	38.9	37.0	44.5
30-34	16.8	18.9	20.7	33.4	26.3	31.7	28.4
Total	100	100	100	100	100	100	100
Duration of residence (years):							
0-1	34.1	31.1	20.0	31.6	30.6	28.4	29.0
2-3	46.2	41.6	43.0	37.9	37.6	40.5	37.3
4-5	19.7	27.2	37.0	30.5	31.8	31.1	33.7
Total	100	100	100	100	100	100	100
Years of education:							
$<$11	1.4	5.3	22.2	3.9	6.6	9.2	6.6
11-13	22.1	40.3	40.1	17.9	19.4	20.0	31.4
$\geq$14	76.5	54.4	37.7	78.3	74.0	70.9	62.0
Total	100	100	100	100	100	100	100
Economic activity:							
Employed	78.7	74.6	11.9	47.9	59.6	38.9	63.8
Unemployed	4.7	6.3	4.2	10.0	5.4	5.5	5.4
Inactive	14.6	14.0	77.1	37.3	18.0	29.3	21.4
Full-time student	2.0	5.1	6.8	4.9	17.0	26.3	9.4
Total	100	100	100	100	100	100	100
Males:							
Age at survey (years):							
20-24	31.2	33.0	28.1	15.2	30.8	36.9	25.6
25-29	45.4	40.0	47.4	45.0	42.1	35.9	42.6
30-34	23.4	27.0	24.6	39.8	27.1	27.2	31.8
Total	100	100	100	100	100	100	100
Duration of residence (years):							
0-1	35.0	34.0	23.9	34.1	32.0	28.0	30.2
2-3	45.8	46.8	41.6	36.9	36.9	39.7	40.0
4-5	19.2	19.1	34.5	29.0	31.1	32.3	29.8
Total	100	100	100	100	100	100	100
Years of education:							
$<$11	2.7	4.1	13.0	4.5	7.8	10.6	6.1
11-13	25.2	46.5	27.3	11.6	24.3	18.2	30.3
$\geq$14	72.1	49.4	59.8	83.9	68.0	71.2	63.6
Total	100	100	100	100	100	100	100
Economic activity:							
Employed	94.6	87.8	73.0	85.8	69.1	45.7	74.2
Unemployed	2.5	4.7	6.8	2.6	6.1	7.2	6.9
Inactive	2.1	2.1	5.5	1.9	5.9	13.2	6.0
Full-time student	0.9	5.4	14.7	9.6	18.9	33.9	12.9
Total	100	100	100	100	100	100	100

Source: UK Labour Force Survey, April-June Quarters 2001-2009;
n=6,074 females; n=5,428 males.
[a]ROW=Rest of world.

Table 5.6: Distribution of key characteristics and percentages who are partnered for female and male recent migrants

	Females		**Males**	
	% Partnered[a]	*(Total n)*[b]	% Partnered	*(Total n)*
Age at survey (years):				
20-24	49.6	*(1,841)*	22.5	*(1,510)*
25-29	70.7	*(2,525)*	49.9	*(2,275)*
30-34	77.3	*(1,708)*	67.1	*(1,643)*
Country of birth				
Poland	73.4	*(737)*	54.0	*(805)*
Other A8	63.2	*(386)*	49.9	*(304)*
Pakistan/Bangladesh	86.9	*(343)*	55.5	*(396)*
India	88.6	*(488)*	53.2	*(500)*
Other:Europe	59.6	*(1,358)*	43.4	*(1,128)*
Other:Asia	60.2	*(981)*	31.7	*(857)*
Other:Rest of world	59.7	*(1,781)*	49.1	*(1,438)*
Duration of residence in the UK (years):				
0-1	60.3	*(1,793)*	36.8	*(1,660)*
2-3	66.5	*(2,397)*	48.7	*(2,195)*
4-5	69.6	*(1,884)*	55.3	*(1,573)*
Years of education:				
$<$11	71.2	*(445)*	46.6	*(382)*
11-13	69.0	*(1,582)*	53.1	*(1,399)*
$\geq$14	63.7	*(4,047)*	44.6	*(3,647)*
Economic activity:				
Employed	64.0	*(3,448)*	54.6	*(4,020)*
Unemployed	68.3	*(339)*	41.2	*(304)*
Inactive	85.6	*(1,588)*	35.7	*(328)*
Full-time student	30.8	*(699)*	15.2	*(776)*

Source: UK Labour Force Survey, April-June Quarters 2001-2009;
n=6,074 females; n=5,428 males.
[a] Weighted percentages. [b] Unweighted totals for each category.
For each sub-sample, Pearson chi-square tests of association find each variable to be statistically significantly associated with partner status at the 0.1% significance level ($p<0.001$).

have the highest proportion with 14+ years of education, amongst all countries of birth. Furthermore, there are considerable differences in the economic activity statuses of the two groups, with over three quarters of the Bangladeshi/Pakistani females being economically inactive in comparison to 37% of the Indian group. For both of these groups the proportions who are full-time students are low, suggesting that this status is indeed for recent migrants from other parts of Asia than the Indian subcontinent[4]. An interesting pattern is also found for the Polish and Other A8 females, with three quarters of the Polish females having 14+ years of education, whilst just over half of the Other A8 females do. Despite this difference, the distribution of economic activity statuses is very similar for both groups, with approximately three quarters in employment, and around 14-15% economically inactive.

A greater proportion of the Pakistani/Bangladeshi males have 14+ years of education than do the females, but this is still considerably lower than for Indian males, who have the highest proportion with 14+ years of education of all groups, as found for Indian females. The disparity between the education of the Polish and Other A8 groups is found for males also, with 72% of the Polish males having 14+ years of education in comparison to just under half of the Other A8 males. Very high proportions of the Polish, Other A8 and Indian groups are employed, in comparison to 73% of the Pakistani/Bangladeshi group, for whom the proportion is still relatively high. Approximately 15% of the Pakistani/Bangladeshi males are full-time students, with the Pakistani/Bangladeshi group having higher proportions unemployed/inactive than Indian, Polish and Other A8 males, although this only relates to a small proportion.

In Table 5.6 all of the bivariate associations with partnership status are found to be statistically significant at the 0.1% level. In this table it can be seen that the largest of the country of birth groups is Poland for both males and females, reflecting the growing importance of this group amongst the foreign-born population in the UK. The bivariate relationships show increasing proportions are partnered at older ages and with increasing durations of residence. For females, years of education is negatively associated with partnership status, whilst for males the pattern is less clear. For females, the proportions partnered are highest amongst the Pakistani/Bangladeshi and Indian groups, followed by the Polish and then the Other A8 group. For males, the proportions are similar across these countries of birth with the Other A8 group having the lowest proportions partnered. Finally, for males and females, the full-time student group have the lowest proportions

[4]An investigation of country of birth for the full-time students for female recent migrants in the Other Asia group confirms that the most common countries of birth for these individuals are China, Hong Kong, Japan and Malaysia.

partnered, whilst for males the highest proportions partnered are amongst the employed and for females amongst the inactive and unemployed.

These relationships are now explored within a multivariate framework, allowing controls for the effects of other covariates, for females in Section 5.3.3 next and for males in Section 5.3.4 afterwards.

5.3.3 Females

The results from the logistic regression models for recent migrant females are presented in Table 5.7. Model 1 includes country of birth and duration of residence in the UK, Model 2 controls for years of education and economic activity status and Model 3 includes statistically significant two-way interactions.

In Model 1, the odds of being partnered are found to be 2.64 and 2.23 times greater for the Pakistani/Bangladeshi and Indian females in comparison to Polish females. An interesting finding is that the Other A8 group are found to be statistically significant different to the Polish females, with the Other A8 group having 1.66 greater odds of *not* being partnered. There is currently little known research comparing the family patterns of Polish migrants with Other A8 groups in the UK, but it might have been expected that their patterns would be similar. However, this could be explained by the large scale of Polish migration to the UK and the possibility that migration may be associated with family moves or settlement and therefore qualitatively different for this group in comparison to the Other A8 group. The odds for the Other A8 group are still higher than those of the Other European, Asian and Rest of World groups, who have the lowest odds of being partnered. This is not surprising because the key countries of birth focused on here are those that feature in the most common countries of birth for foreign-born parents having live births in the UK and represent individuals for whom migration is thought to be related to being in or forming families. The odds of being partnered are found to increase with duration of residence in the UK, with 1.20 and 1.31 greater odds for those who have been resident 2-3 and 4-5 years, respectively, in comparison to those who have been resident 0-1 years. This suggests that migration is not closely associated with partnering, given that the odds increase with duration of residence.

In Model 2, the coefficients for country of birth decrease with controls for education and economic activity, suggesting that differences in these characteristics explained some of the observed variation in Model 1. The relative patterns remain the same in relation to the Polish reference group with Pakistani/Bangladeshi and Indian females having higher partnership odds, whilst all other females have

Table 5.7: Log-odds of being partnered: Female recent migrants aged 20-34 years

	(1) Demographics		(2) Education & Economic Activity		(3) Interactions	
Constant	0.300**	(0.101)	−0.078	(0.171)	0.613**	(0.228)
Age at survey (years)						
(ref: 20-24)						
25-29	0.949***	(0.068)	0.848***	(0.072)	0.285*	(0.135)
30-34	1.327***	(0.079)	1.111***	(0.083)	0.616***	(0.139)
Country of birth						
(ref: Poland)						
Other A8	−0.505***	(0.144)	−0.491***	(0.147)	−0.527***	(0.148)
Pakistan/Bangladesh	0.969***	(0.194)	0.446*	(0.203)	0.356	(0.223)
India	0.801***	(0.171)	0.689***	(0.175)	0.505**	(0.177)
Other:Europe	−0.758***	(0.107)	−0.611***	(0.110)	−0.599***	(0.117)
Other:Asia	−0.791***	(0.114)	−0.631***	(0.120)	−0.217	(0.192)
Other:Rest of world (ROW)	−0.845***	(0.104)	−0.819***	(0.106)	−0.834***	(0.129)
Duration of residence (years)						
(ref: 0-1)						
2-3	0.182**	(0.069)	0.209**	(0.072)	0.378***	(0.084)
4-5	0.271***	(0.075)	0.263***	(0.079)	0.513***	(0.092)
Years of education						
(ref: <11)						
11-13			0.435**	(0.142)	−0.173	(0.197)
14+			0.297*	(0.135)	−0.698**	(0.214)
Economic activity status						
(ref: Employed)						
Unemployed			0.236	(0.129)	0.891***	(0.240)
Inactive			1.146***	(0.086)	1.020***	(0.284)
FT student			−1.035***	(0.097)	−0.256	(0.267)
Age*Country of birth						
25-29*Other:ROW					0.348**	(0.132)
30-34*Pakistan/Bangladesh					−1.035**	(0.397)
Age*Years of education						
25-29*14+					0.654***	(0.152)
30-34*14+					0.838***	(0.172)
Age*Economic activity status						
25-29*Unemployed					0.774**	(0.277)
Country of birth*Years of education						
Other:Asia*14+yrs					−0.669***	(0.193)
Country of birth*Economic activity status						
Other:Europe*FT Student					−0.918**	(0.314)
Other:Asia*FT Student					−0.686*	(0.320)
Other:ROW*Inactive					−0.964***	(0.176)
Other:ROW*FT Student					−0.761*	(0.327)
Duration of residence*Economic activity status						
2-3*Unemployed					−1.067***	(0.316)
2-3*Inactive					−0.597**	(0.210)
4-5*Unemployed					−1.783***	(0.320)
4-5*Inactive					−0.843***	(0.212)
Years of education*Economic activity status						
11-13*Inactive					0.935***	(0.271)
14+*Inactive					1.346***	(0.263)
Observations	6,074		6,074		6,074	
Pseudo R^2	0.088		0.142		0.165	

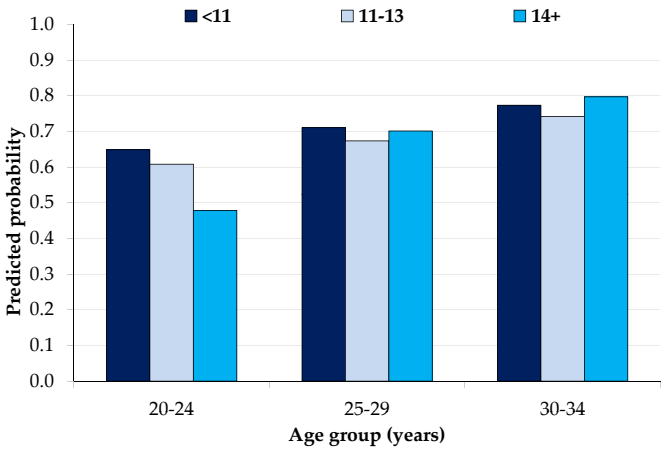
Source: UK Labour Force Survey, April-June Quarters 2001-2009
Robust standard errors in parentheses
Level of statistical significance: * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

lower partnership odds. However, the controls see a particularly large reduction in the odds for the Pakistani/Bangladeshi group, from 2.64 in Model 1 to 1.56 in Model 2, in comparison to Polish females. Thus, whilst Pakistani/Bangladeshi females are found to have the highest partnership odds of all groups in Model 1, Indian females are found to in Model 2 when educational and economic activity differences have been taken into account.

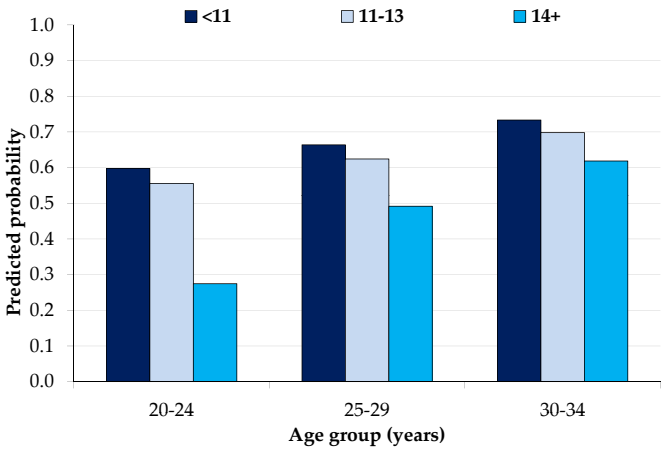
The coefficient for those who have been resident in the UK for 2-3 years increases in Model 2, suggesting that duration of residence may be in some way correlated with education or economic activity in relation to partnership status. Whilst economic activity relates to the odds of being partnered as would be expected, the result for years of education is unexpected. In Model 2, the lowest odds of being partnered are found for those with <11 years of education and the highest odds are found for individuals with 11-13 years of education. This pattern was also found for the females in Model 2 in the previous section (Table 5.3) but disappeared once interaction terms were included in Model 3, as is also found here.

In Model 3, (Table 5.7), statistically significant interactions are found between all main effects, except for duration of residence which is only found to interact with economic activity status. Predicted probabilities are used to interpret the effects of these interaction terms. The role played by education, in relation to the probabilities of being partnered, can be seen in Figure 5.5. The graph for Polish females represents how education acts for all country of birth groups, other than the Other Asia group for whom there is an interaction with education. In Figure 5.5(a), it can be seen that higher education has a negative effect on partnership probabilities at ages 20-24 years, whilst at ages 25-29 and 30-34 years the probabilities are very similar across educational groups. This pattern is observed due to the interaction effects between age and years of education. Whilst such an interaction effect would be expected, it is interesting that the negative effects of higher education have already disappeared by ages 25-29 years. For these groups, the probabilities of being partnered are high, regardless of educational level, which could be due to the selected nature of the recent migrant group. It is known that many of the young recent migrants are highly educated but this does not appear to be a determinant of their partnership probabilities over ages of 24 years.

Figure 5.5(b) shows that for recent migrant females from Other Asia, higher education continues to have a negative association with partnership probabilities at older ages also. For this group, higher education may be more associated with employment opportunities and social mobility, whilst for individuals from all other countries of birth education appears to only delay partnership formation.



(a) Country of birth: Poland



(b) Country of birth: Other Asia

Predicted probabilities are calculated for individuals who are employed and have been resident in the UK for 0-1 years.

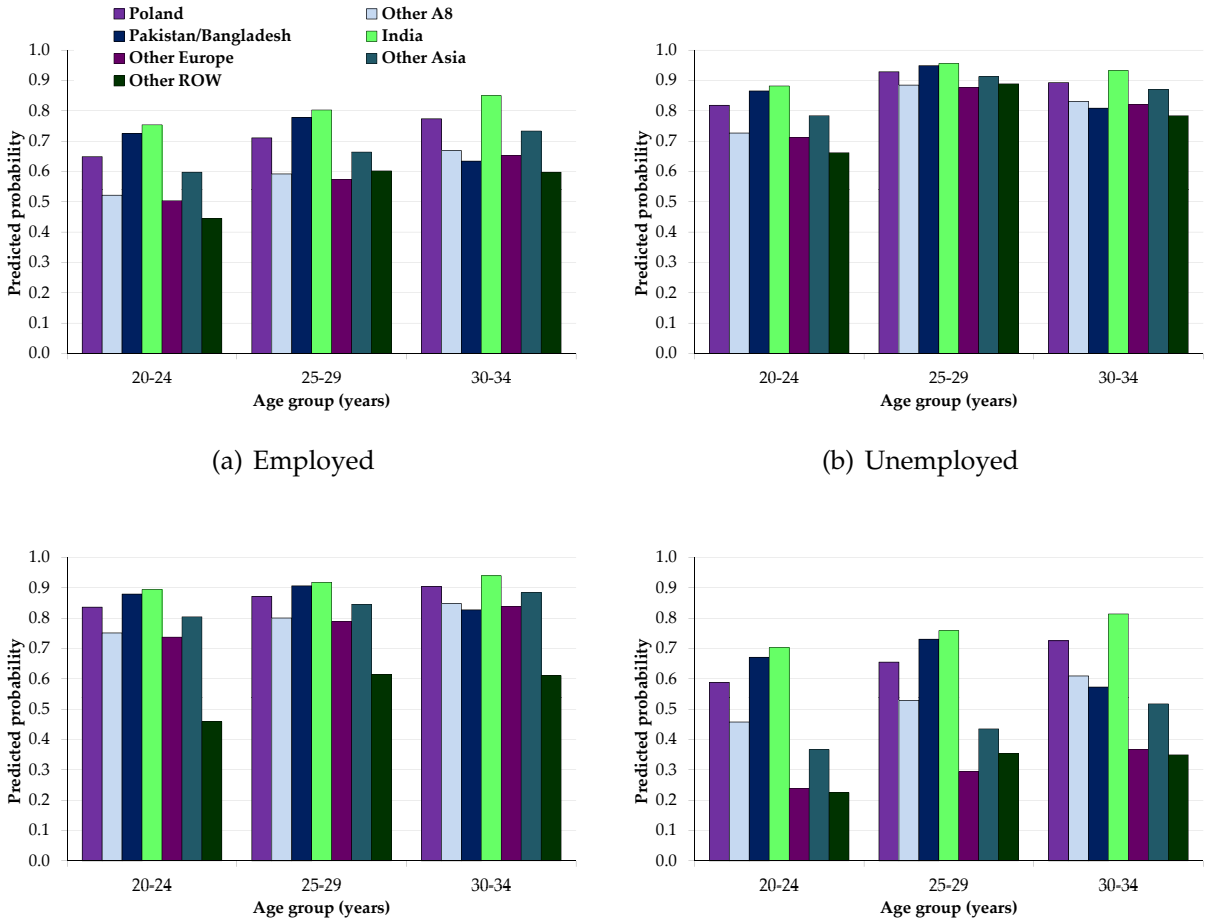
Figure 5.5: Predicted probabilities of being partnered for recent migrant females aged 20-34 years, by years of education (<11; 11-13; 14+) and country of birth

The interaction effects between 11-13 and 14+ years of education with economic inactivity show that even amongst the highly educated, economic inactivity is associated with high partnership probabilities, as was also found for females in the previous section (Table 5.3). This would act to reduce the negative effect for Other Asian females if they are economically inactive, but their probabilities will still be lower than for all other country of birth groups of the same age and with 14+ years of education.

Predicted probabilities of being partnered are presented in Figure 5.6 by economic activity status, country of birth and age at survey, illustrating a number of different patterns. Across the graphs in Figure 5.6, it can be seen that Indian females have the highest probabilities of being partnered, followed by the Bangladeshi/Pakistani group. However, for the Pakistani/Bangladeshi group, the high probabilities are found for younger recent migrants, with a decrease in the probabilities for this group at age 30-34 years. Polish females have the next highest probability, followed by the Other A8 group. Note that the Other Asia group have higher probabilities than the Other A8 group in these figures because education is held constant at <11 years, but at 14+ years the Other Asian group have decreased probabilities. Except amongst full-time students, the Other Europe group have comparable probabilities to the Other A8 females.

The probabilities of being partnered are highest for the economically inactive and unemployed groups. For the unemployed, this peaks at ages 25-29 years, with slightly lower partnership probabilities amongst the unemployed aged 30-34 years. For the economically inactive, the probabilities are high across age groups, except for the Other Rest of World (ROW) group for whom economic inactivity is not so closely associated with partnership status. Whilst economic activity status does relate to differential probabilities of being partnered, the probabilities found for Polish, Indian and Pakistani/Bangladeshi females are high across economic activity groups. This can especially be seen in Figure 5.6(d) where being a full-time student is associated with lower partnership probabilities for these groups, but does not have such a negative effect as it does for the Other Asian, Other European and Other ROW groups.

Finally, a very interesting finding emerges in the interaction found between duration of residence in the UK and economic activity status. The predicted probabilities are shown for this interaction in Figure 5.7. This shows that for those who are employed or full-time students, the partnership probabilities increase with duration of residence, whilst for the inactive and unemployed the reverse is true. The decrease with increasing duration of residence is greater for those who are unemployed, due to the very high probabilities of being in a partnership for all econom-



(a) Employed

(b) Unemployed

(c) Inactive

(d) Full-time student

Predicted probabilities are calculated for individuals with <11 years of education, who have been resident in the UK for 0-1 years.

Figure 5.6: Predicted probabilities of being partnered for female recent migrants aged 20-34 years, by economic activity status and country of birth

ically inactive females. This finding fits with what is expected with the inactive and unemployed groups having high partnership probabilities due to migrating for family formation or reunification, whilst for the employed and full-time student groups, their partnership status is less closely tied to the migration event. It was also expected that duration of residence would interact with country of birth for females from India and Pakistan/Bangladesh due to marriage migration, but the interaction between country of birth and duration of residence is not statistically significant. Therefore, it appears that the economic activity status of these groups adequately explains this effect and that it is not necessarily specific to these groups, although it is likely to be more common for females from India and Pakistan/Bangladesh because they have much higher proportions that are inactive and unemployed (see Table 5.5).

Predicted probabilities are calculated for Pakistani/Bangladeshi migrants, aged 25-29 years, with <11 years of education.

Figure 5.7: Predicted probabilities of being partnered for female recent migrants aged 20-34 years, by economic activity status and duration of residence in the UK

In this section, the findings show that probabilities of being partnered are very high for all females from Poland, India and Pakistan/Bangladesh. This is not perhaps surprising given that these groups are thought to experience migration which is in some way related to being in a family or family formation. However, these estimates provide confirmation that this does appear to be the case for Polish females also, with little existing quantitative evidence available. Furthermore, it provides an interesting finding that this group appears to differ from Other A8 females, whose migration experience may have been considered similar to the Polish group, except for the scale of migration from Poland to the UK, in particular. The Polish females display slightly lower partnership probabilities than the Indian group at all ages and than Pakistani/Bangladeshi females at all ages except 30-34 years, where they are higher. The migration experience of this group in compari-

son to migrants from the Indian subcontinent is quite different but for all groups it seems to be associated with high probabilities of being partnered. It appears that partnership is most closely tied to the migration event itself for economically inactive females, which applies most to Pakistani/Bangladeshi females, and Indian females to a lesser extent.

5.3.4 Males

The logistic regression results for the male recent migrants are shown in Table 5.8, with the model building stages conducted in the same order as for females. Model 1 includes age at survey, country of birth and duration of residence in the UK, Model 2 includes education and economic activity, and Model 3 includes two-way interactions.

In Model 1, males from Pakistan/Bangladesh and the Other A8 countries are not found to have statistically significantly different partnership odds to Polish males, whilst all other groups have lower partnership odds than the Polish group. For example, the odds of *not* being partnered are 1.46, 1.49, 1.74 and 2.95 times greater for males from India, Other Rest of World (ROW), Other Europe and Other Asia, respectively, in comparison to the Polish group. The partnership odds are also found to increase with duration of residence in the UK, as found for females.

When years of education and economic activity status are controlled for in Model 2, the Indian males are found to no longer have statistically significantly different partnership odds to the Polish males, and this also remains to be the case for Pakistani/Bangladeshi and Other A8 males. The coefficients for all of the Other groupings decrease in Model 2, suggesting that some of the observed variation in Model 1 is attributable to education and economic activity differentials. Despite the decrease, the Other groupings continue to have lower odds of being partnered than the Polish group. Therefore, whilst the Polish, Other A8, Indian and Pakistani/Bandladeshi groups have the highest odds of being partnered, the odds do not differ between these groups as they do for females.

In Model 2, it is interesting to find that the odds of being partnered are not statistically significantly different between years of education levels, but are between economic activity statuses. The employed group have the greatest odds of being partnered, and the full-time student group the lowest.

In Model 3, statistically significant interactions are found for country of birth with all of the other main effects and also for duration of residence with economic activity status. Figure 5.8 presents the predicted probabilities for recent migrants

Table 5.8: Log-odds of being partnered: Male recent migrants aged 20-34 years

	(1) Demographics		(2) Education & Economic Activity		(3) Interactions	
Constant	-1.093^{***}	(0.105)	-0.869^{***}	(0.159)	-1.369^{***}	(0.184)
Age at survey (years)						
(ref: 20-24)						
25-29	1.166^{***}	(0.075)	1.051^{***}	(0.078)	1.106^{***}	(0.080)
30-34	1.900^{***}	(0.084)	1.722^{***}	(0.088)	1.544^{***}	(0.096)
Country of birth						
(ref: Poland)						
Other A8	-0.197	(0.152)	-0.204	(0.153)	-0.166	(0.150)
Pakistan/Bangladesh	-0.053	(0.142)	0.173	(0.140)	1.598^{***}	(0.296)
India	-0.377^{**}	(0.123)	-0.221	(0.125)	-0.475^{*}	(0.186)
Other:Europe	-0.555^{***}	(0.104)	-0.317^{**}	(0.106)	0.842^{**}	(0.293)
Other:Asia	-1.081^{***}	(0.112)	-0.645^{***}	(0.119)	-0.815^{***}	(0.139)
Other:Rest of world (ROW)	-0.395^{***}	(0.100)	-0.207^{*}	(0.101)	-0.205^{*}	(0.099)
Duration of residence (years)						
(ref: 0-1)						
2-3	0.392^{***}	(0.072)	0.345^{***}	(0.073)	0.478^{***}	(0.082)
4-5	0.584^{***}	(0.079)	0.501^{***}	(0.081)	0.498^{***}	(0.082)
Years of education						
(ref: <11)						
11-13			0.151	(0.132)	0.485^{**}	(0.161)
14+			-0.141	(0.124)	0.357^{*}	(0.154)
Economic activity status						
(ref: Employed)						
Unemployed			-0.381^{**}	(0.129)	-0.199	(0.144)
Inactive			-0.632^{***}	(0.130)	-0.646^{***}	(0.133)
Full-time (FT) student			-1.349^{***}	(0.110)	-0.709^{***}	(0.161)
Age*Country of birth						
30-34*Pakistan/Bangladesh					1.324^{***}	(0.248)
30-34*Other Asia					0.591^{**}	(0.191)
Country of birth*Duration of residence						
Pakistan/Bangladesh*2-3					-0.592^{*}	(0.260)
India*2-3					-0.517^{*}	(0.236)
Country of birth*Years of education						
Pakistan/Bangladesh*14+					-1.559^{***}	(0.292)
Other Europe*11-13					-0.951^{**}	(0.319)
Other Europe*14+					-1.240^{***}	(0.298)
Country of birth*Economic activity status						
Pakistan/Bangladesh*FT Student					-2.097^{***}	(0.536)
India*Inactive					2.233^{*}	(0.939)
India*FT student					-2.537^{*}	(1.084)
Other Europe*FT Student					-0.964^{***}	(0.275)
Other Asia*Unemployed					-0.919^{*}	(0.383)
Duration of residence*Economic activity status						
2-3*FT student					-0.474^{*}	(0.220)
Observations	5,428		5,428		5,428	
Pseudo R^2	0.113		0.141		0.162	

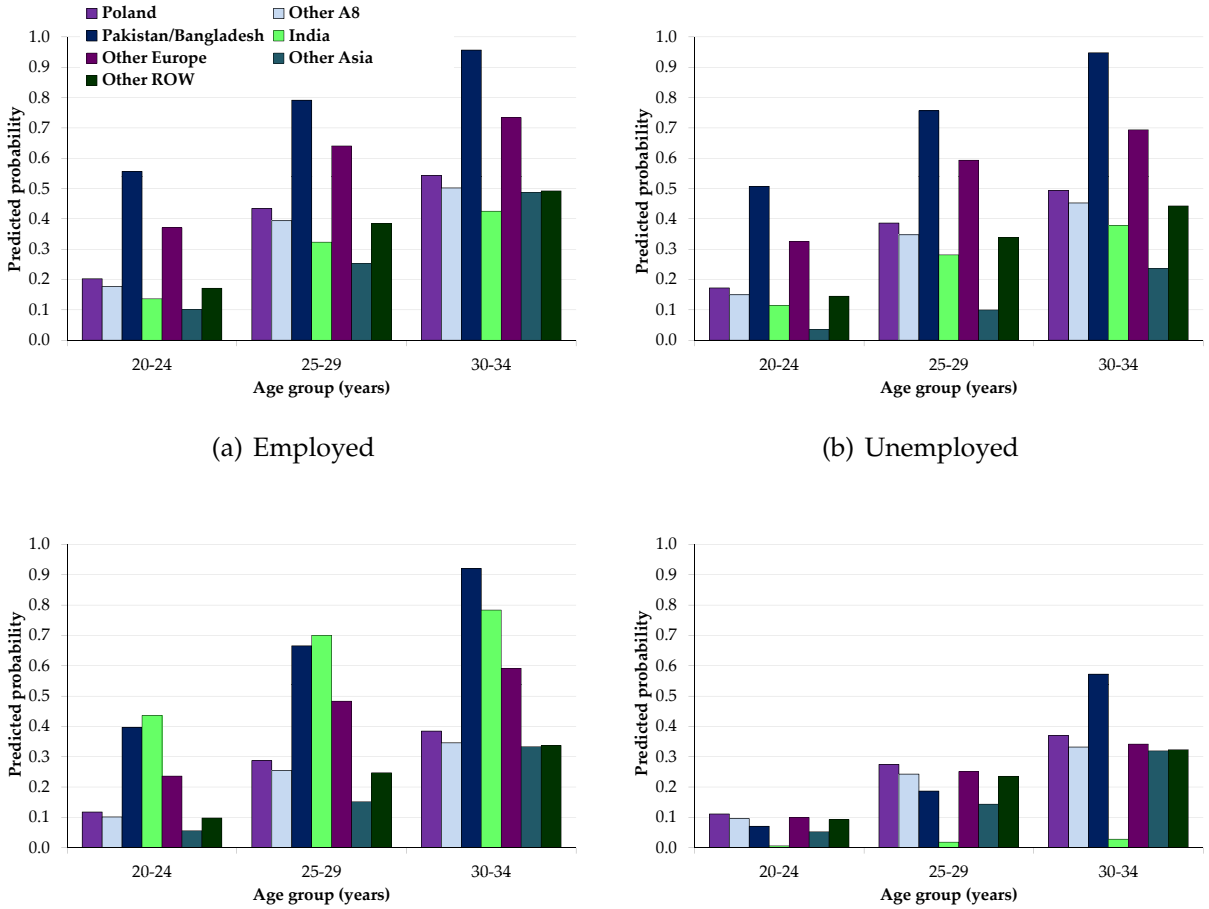
Source: UK Labour Force Survey, April-June Quarters 2001-2009
Robust standard errors in parentheses
Level of statistical significance: * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

by economic activity status.

Firstly, it can be seen that for all males who are full-time students, the partnership probabilities are particularly low, with the exception of the Pakistani/Bangladeshi group aged 30-34 years, but this probability is still only equal to 0.57. This is especially pronounced for Indian and Bangladeshi/Pakistani full-time students. For all groups, except Indian males, the highest partnership probabilities are found for employed males. For Indian males, the probabilities of being partnered are highest amongst the economically inactive group. Therefore, for most groups being partnered is associated with being in employment, but for Indian males economic inactivity is closely related with partnership status.

For the groups whose probabilities are highest amongst the employed, the next highest probabilities are found for the unemployed group, except for the Other Asian group for whom being unemployed is related to lower partnership probabilities. For the key countries of birth of interest, economic activity status relates to partnership status largely in the same way for Pakistani/Bangladeshi, Polish and Other A8 males, but for Indian males economic inactivity is most important. The relative patterns between countries of birth across economic activity statuses show the Pakistani/Bangladeshi males to have relatively high partnership probabilities, along with the Other Europe group. Meanwhile, the Polish and Other A8 males have comparable probabilities, which are higher than the Indian group, except amongst the inactive. However, education is held constant at <11 years in these calculations, but interacts with Pakistan/Bangladesh and Other Europe, meaning that their probabilities will not always be so relatively high, as illustrated in Figure 5.9.

In Figure 5.9, the Polish pattern illustrates how education relates to partnership status for all groups, except the Pakistani/Bangladeshi and Other Europe groups. For the Polish group, it can be seen that the lowest partnership probabilities are found for those with <11 years of education and comparable probabilities for those with 11-13 and 14+ years of education, though this is slightly higher for the 11-13 years group. These findings could reflect the fact that <11 years of education refers to lower than compulsory level of education and therefore these migrants may be engaging in lower-skilled, less stable employment, typically more associated with short-term migration and are therefore less likely to be living with partners. It is interesting that for all but the Pakistani/Bangladeshi and Other Europe groups, having the highest level of education does not appear to substantially decrease partnership probabilities. For



(a) Employed

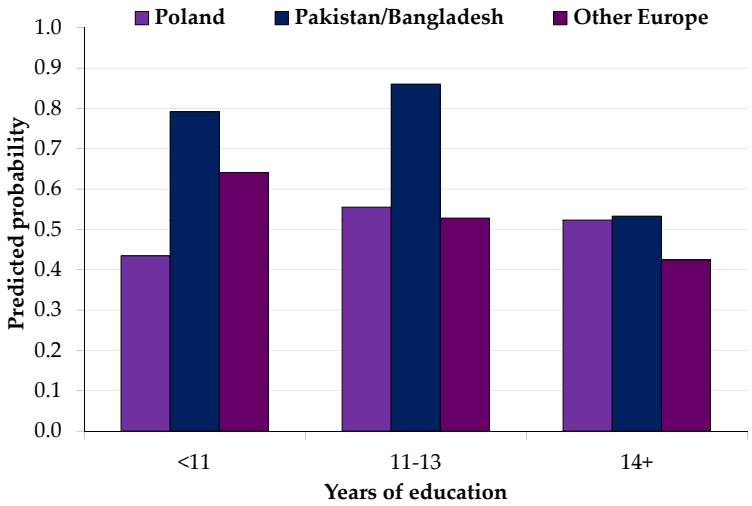
(b) Unemployed

(c) Inactive

(d) Full-time student

Predicted probabilities are calculated for individuals with <11 years of education, who have been resident in the UK for 0-1 years.

Figure 5.8: Predicted probabilities of being partnered for male recent migrants aged 20-34 years, by economic activity status and country of birth



Predicted probabilities are calculated for individuals who are in employment and have been resident in the UK for 0-1 years.

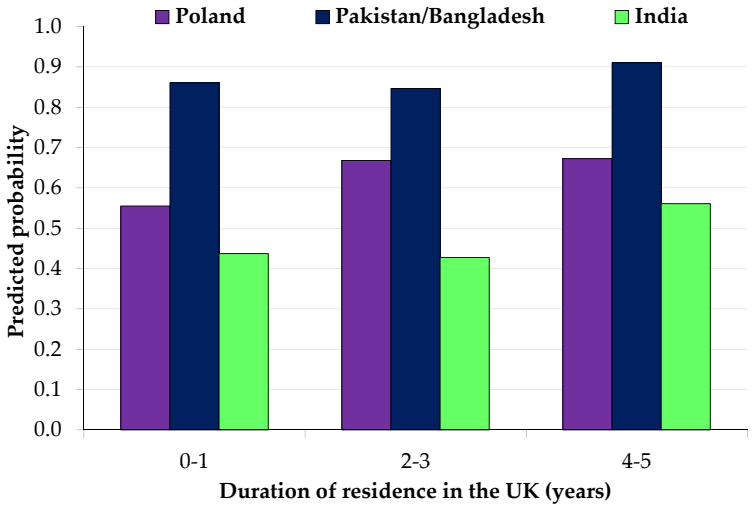
Figure 5.9: Predicted probabilities of being partnered for recent migrant males aged 25-29 years, by country of birth and years of education

the Other European males, education appears to be more important for partnership probabilities with decreasing probabilities as years of education increase. For the Pakistani/Bangladeshi males higher education also relates to decreased partnership probabilities but the distinction is between those that have below 14 versus 14+ years of education, with the highest probabilities for this group found for those with 11-13 years of education.

A final interesting finding for the recent males is the relationship found between duration of residence and partnership status. Duration of residence is found to interact with country of birth for Pakistani/Bangladeshi and Indian males, the effects of which are illustrated in Figure 5.10. The Polish case represents how duration of residence relates to partnership status for all other countries of birth that do not interact with duration of residence. It can be seen that for Polish males with the most recent arrival, the partnership probabilities are lower and then increase for those who have been resident for two years or more. For the Pakistani/Bangladeshi and Indian males, an interesting pattern emerges, whereby those with 4-5 years of residence in the UK have the highest partnership probabilities, which suggests longer time periods after arrival before forming partnerships in comparison to other groups. However, the probabilities of the 2-3 years of residence group are also marginally lower than those for the 0-1 years of residence group. This interaction effect is statistically significant but the difference shown here is small. The pattern does fit with existing knowledge (e.g. Charsley et al., 2012) because marriage migration is also common for males from the Indian subcontinent and therefore this dichotomy could relate to migration being closely tied to partnership status for some of this group and in those cases where it is not, the

partnership probabilities increasing after longer durations of residence.

The effect of marriage migration is not evident in an interaction between economic activity and duration of residence, as was the case for females, due to marriage migration not necessarily being associated with economic inactivity or unemployment in the same way, particularly for the Bangladeshi/Pakistani males. Further insight into whether this relates to family formation related migration can be gained in Section 5.4 when the migrant characteristics and timing of arrival to the UK of partners is explored. This will also provide insight for all males as to whether increased partnership probabilities with duration of residence are associated with family reunification, as is thought to be the case for Polish and Other A8 males, or due to partnering with individuals following arrival. A further interaction effect is found for duration of residence with full-time student status, whereby the probabilities of being partnered only increase at 4-5 years of residence, suggesting that individuals who migrate for study purposes take longer to enter into partnerships than other economic activity groups.



Predicted probabilities are calculated for individuals with 11-13 years of education, who are in employment.

Figure 5.10: Predicted probabilities of being partnered for recent migrant males aged 25-29 years, by country of birth and duration of residence in the UK

In this section, the findings show that recent migration is not always so closely associated with high partnership probabilities for males as it is for females, at these young ages. For males, the probabilities are much higher at older ages, reflecting later entry into partnerships, especially amongst the Pakistani/Bangladeshi group. The partnership probabilities are highest amongst employed males for all groups, except for the Indian males for whom inactivity is related to higher probabilities. However, the economically inactive constitute just 2% of the Indian male recent migrant group (see Table 5.5). The majority of all males are employed, meaning that the probabilities shown in Figure 5.8(a) are particulary relevant. These rel-

ative patterns hold across educational levels for most groups, except for Other European males whose probabilities are comparable to those of the Polish at 11-13 years of education and slightly lower at 14+ years of education. At 14+ years of education, Pakistani/Bangladeshi males have comparable probabilities to Polish males at ages 20-24 and 25-29 years, but continue to have higher probabilities at 30-34 years. The duration of residence patterns also suggest that for most males, the probabilities of being partnered increase with duration of residence in the UK, but for Pakistani/Bangladeshi and Indian males there is also evidence for slightly increased partnership probabilities for very recent arrivals.

5.3.5 Discussion

In this section, the partnership status of recent migrants to the UK has been studied. The exploratory analyses in Section 5.3.2 showed that high proportions of the recent males are employed and also that males from Pakistan/Bangladesh have a sizeable minority who are full-time students. For the females, high proportions of the Polish and Other A8 groups are employed and a minority inactive, whilst the opposite is true for Pakistani/Bangladeshi females and the Indian females are somewhere between the two with around 50% employed and 40% inactive. Indian females are found to have the highest proportions with 14+ years of education, followed by Polish, Other A8 and Pakistani/Bangladeshi females. Almost the same pattern is found for males, except that the proportion is higher for Pakistani/Bangladeshi males than it is for Other A8 males.

In Section 5.3.3 the findings from the logistic regression models fitted for the females show the high partnership probabilities of all females from Pakistan/Bangladesh, India and Poland, and to some extent the Other A8 countries. Economic activity status results in different probabilities of being partnered, but the difference is only large with respect to the low probabilities of full-time students. Furthermore, higher education only results in lower probabilities for those aged 20-24 years, with delays due to the pursuit of higher education seeming to diminish quickly. The relative differences between groups show that probabilities are highest for Pakistani/Bangladeshi and Indian females, followed by Polish females at ages below 30-34 years, whilst they are highest for Indian and Polish females at ages 30-34 years. For the Pakistani/Bangladeshi females, the highest probabilities are found for females who migrate at younger ages, which fits with marriage migration from these countries (e.g. Charsley et al., 2012; Peach, 2006), whilst those who migrate at older ages may differ in the nature of migration undertaken. For females, it is also found that for economically inactive and unemployed females, the

migration event appears to be closely associated with being partnered, whilst for those who are employed or full-time students, partnership probabilities increase with time since arrival. This pattern is found across countries of birth but the greater proportions of Pakistani/Bangladeshi and Indian females who are inactive in comparison to the Polish and Other A8 females may mean that the migration event is more directly related to being in a partnership for the former groups than the latter groups. Thus, the findings reveal that the Polish, Indian and Pakistani/Bangladeshi females all have high partnership probabilities, but that the relationship between partnership formation and migration differs between groups. A further interesting finding for the Other A8 females is that their partnership probabilities are lower than those of the Polish females, which could be due to the larger flows to the UK from Poland and so greater social networks and opportunities for settlement (e.g. Massey et al., 1993; Boyd, 1989).

In section 5.3.4, the findings from the logistic regression models fitted for males show that the partnership probabilities are not consistently high, in contrast to females, which is not surprising since lower proportions of the recent migrant males are partnered than comparable females at ages 20-34 years (see Table 5.5). Later entry into partnership is found for males, but education and economic activity status also account for differences in partnership probabilities. The employed have the highest partnership probabilities amongst most groups and full-time students have very low probabilities. Inactive Indian males also have especially high probabilities. For the Pakistani/Bangladeshi males, years of education is also an important factor, with reduced probabilities amongst those with 14+ years of education. The relative patterns between groups show that amongst the employed (which constitutes the majority of recent male migrants), with lower levels of education, the Pakistani/Bangladeshi males have the highest probabilities, followed by the Polish and Other A8 males, but at the highest educational level the probabilities are comparable across these three groups. The experience of Pakistani/Bangladeshi and Indian males also appears to differ to that of the Polish and Other A8 groups, with respect to duration of residence in the UK; with the former groups having increased partnership probabilities amongst those resident in the UK 0-1 years, whereas lower probabilities are found for the latter groups within 0-1 years of arrival.

The findings across the sections highlight the gendered nature of migration at these young ages with migration related to high partnership probabilities for all females across countries of birth, educational levels and economic activity statuses, except for the full-time student category. By contrast, for males, migration at these ages is not necessarily related to such high partnership probabilities and this varies according to educational and economic activity differences. In this respect, the

effects of sex and age are most important, with similarities found when comparing female migrants from the Indian subcontinent with those from the A8 countries. However, key differences emerge in how the migration event appears to relate to partnership probabilities across these groups with duration of residence patterns suggesting that for Bangladeshi/Pakistani and Indian groups migration itself may be more closely associated with being in a partnership than for individuals from the A8 countries, for both males and females.

In the next section, this is explored further with analyses of partner characteristics for the recent migrant groups analysed here.

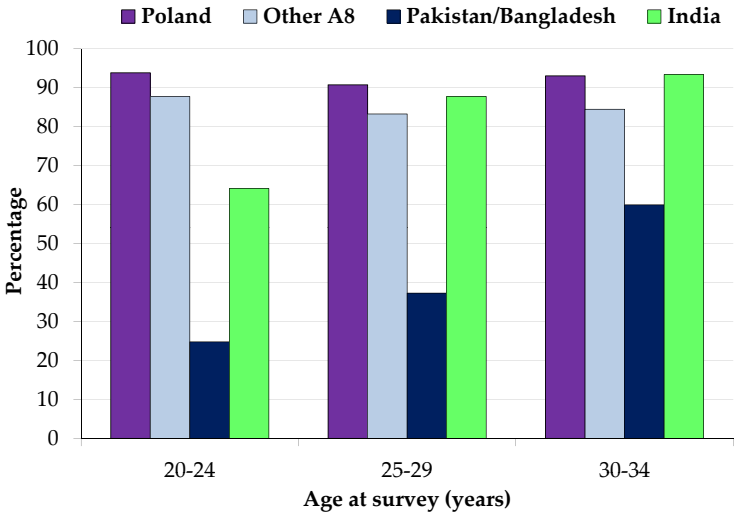
5.4 Partner characteristics

Whilst in Sections 5.2 and 5.3 the characteristics associated with the probabilities of being partnered were explored, it is now of interest to consider the individuals with whom migrants are partnering, given that they are partnered. In this short section, some exploratory analyses are conducted to consider firstly whether individuals are partnered with other migrants or UK-born individuals, and secondly, for those with migrant partners, whether their partners migrated to the UK before, after or at the same time. The analyses are restricted to recent migrants aged 20-34 years who are partnered, and focus on the key countries of birth groups of interest within this research: Other A8, India, Pakistan/Bangladesh and Poland.

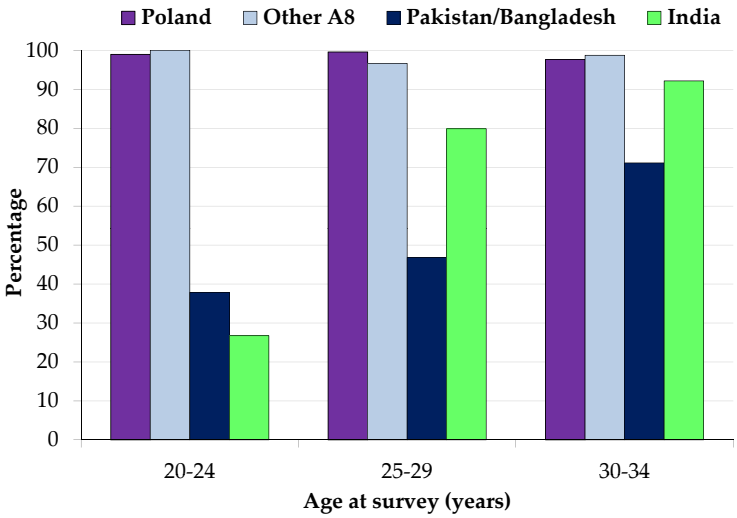
Figure 5.11 shows the percentages of female (a) and male (b) recent migrants who are partnered with foreign-born partners. For the Polish and Other A8 groups, the vast majority are partnered with other migrants. For the males, this is found at all ages, whilst for females the minorities partnered with UK-born individuals are slightly higher for older females. Thus, it might be that older females are more likely to migrate alone and subsequently form partnerships after arrival, but the vast majority are partnered with other migrants still. An opposite trend is found for the Bangladeshi/Pakistani and Indian groups, whereby the proportions who are partnered with other migrants are higher at older ages. Young migrants from these countries are particularly likely to partner UK-born individuals, which fits with the marriage migration of these groups (e.g. Charsley et al., 2012; Peach, 2006).

The Pakistani/Bangladeshi groups have the lowest proportions who are partnered with foreign-born individuals, except amongst males aged 20-24 years, where approximately three quarters of Indian males are partnered with UK-born partners. Apart from the Indian group at ages 20-24 years, where a much higher proportion of females are partnered with foreign-born partners than found for males,

the patterns displayed for males and females from the same countries of birth are very similar. This fits with recent evidence showing that the numbers of husbands and wives from these countries who migrated for marriage migration to the UK in 2008 are fairly equal (Charsley et al., 2012). Furthermore, the trends shown in Figure 5.11 refer to the proportions amongst those who *are partnered*, so has already controlled for differences in the probability of being partnered found for Pakistani/Bangladeshi males and females in the previous section.



(a) Females

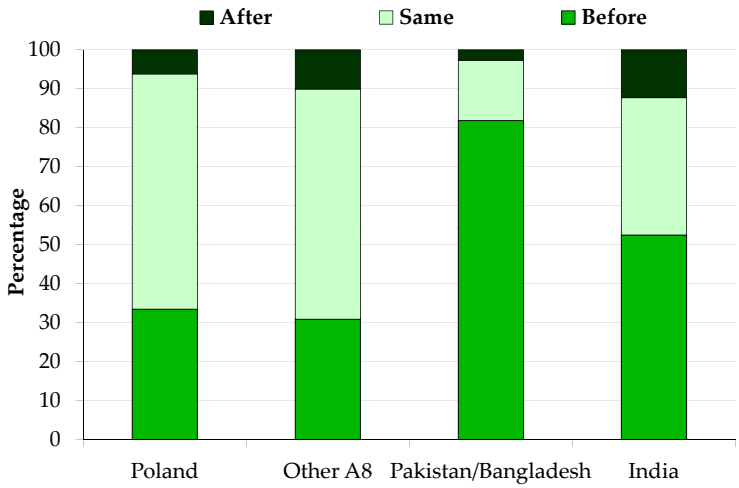


(b) Males

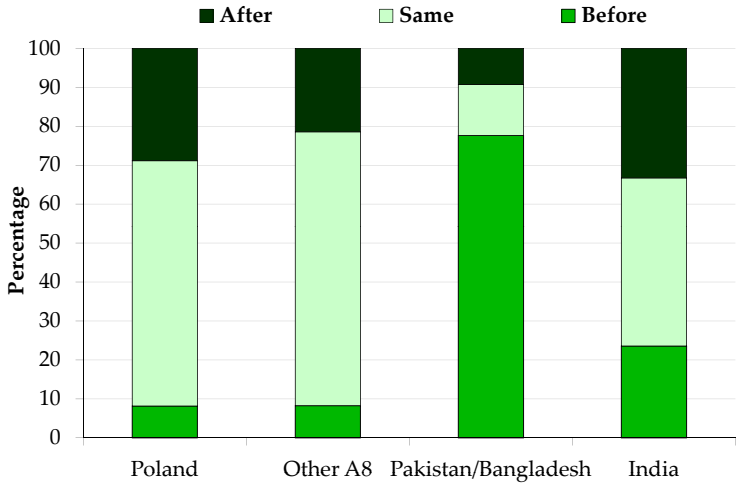
Figure 5.11: Weighted percentages of partnered recent migrants whose partners are foreign-born, by age, sex and country of birth

Figure 5.12 shows the arrival timing of migrant partners in relation to the arrival of the recent migrants. This information is obtained by attaching partner's arrival information to the recent migrant's record, using the year of first arrival to the UK variable (cameyr) available within the Labour Force Survey (LFS). This is subject to the limitations discussed earlier in Section 3.4, whereby subsequent exits

and re-entry to the UK will not be captured within this variable. Since this refers to year of arrival to the UK, it also means that individuals who migrated within the same year may not have necessarily migrated together or have been partnered before arrival. There may also be some bias due to the fact that an individual who migrated within one month of their partner but in a different year will be identified as having different arrivals, whilst for those who migrated ten months apart but within the same year, arrival timing will be identified as being the same. Nonetheless, this is the greatest level of precision currently available within the LFS in relation to timing of arrival and provides new insights into migration patterns.



(a) Females



(b) Males

Figure 5.12: Weighted percentages showing partner's arrival year to the UK in relation to one's own, for recent migrants aged 20-34 years whose partner is foreign-born

The patterns presented in Figure 5.11 are aggregated across the three age groups to maintain large sample sizes and also because the patterns found within most

groups are similar across ages. Where patterns differ between age groups, this will be discussed below. For the Polish and Other A8 groups the patterns found are very similar and those of the female groups fit well with those of the male groups. For example, the majority of both groups arrived within the same year as their partner, whilst for those that did not, the majority of females' partners arrived before them and males' partners arrived after them. For the Polish females, the proportions with partners who arrived before them are slightly higher, and the proportions whose partners arrived in the same year slightly lower, amongst the 30-34 years age group, suggesting that for older females they may be more likely to migrate to join a partner. This could be due to the greater likelihood of already having established a family or career at older ages and therefore one partner 'testing' the migration destination before the couple/family unit make the move (e.g. White, 2011; Taylor, 1999; Stark and Bloom, 1985).

Approximately one-third of Indian females migrated within the same year as their partner, whilst the proportion is slightly higher for Indian males. Just over half of the Indian females arrived to the UK after their partners, whilst around one third of Indian males arrived before their partners. Just under a quarter of the Indian males also had partners who arrived before them, with quite a mixed profile found for Indian males. For the Indian females, the percentages with partners arriving before decreases with age, whilst the percentages arriving within the same year increases, suggesting that Indian females who migrate at older ages may be more likely to do so with their partners/families.

Finally, the results for the Pakistani/Bangladeshi groups are very interesting because a very similar profile is observed for both sexes, with the majority partnered with individuals who arrived before them. Thus, the patterns show that these individuals can not be partnered with each other, with only 13-15% of these groups arriving to the UK within the same year as a partner. The percentage partnered with individuals who arrived before them is especially high for Pakistani/Bangladeshi females aged 20-24 years.

The findings in this section highlight the contrast in the migration experience of the recent migrants from the South Asian countries on the one hand and those from the A8 countries on the other, after controlling for the fact that these individuals are partnered. For the Indian and especially the Pakistani/Bangladeshi groups, partnering with UK-born individuals is found to be common, whilst this is not the case for Polish and Other A8 groups who are largely partnered with other migrants. This fits with existing knowledge for the migration of South Asian groups to the UK for family formation, given that these groups have large social networks and established communities in the UK, due to the earlier large-scale post World War II

migration of these groups. This paired with social and cultural preferences within these communities to partner with individuals with certain shared characteristics and the fact that the second-generations are now at marital and childbearing ages, means that unions are commonly formed between migrants and UK-born individuals, largely from within the same ethnic and religious groups but with different countries of birth (e.g Charsley et al., 2012; Peach, 2006). For the Polish and Other A8 groups, the large-scale immigration to the UK is very recent and so whilst there are large social networks for these groups, there is not the same trend for partnering with UK born individuals.

Amongst the migrant couples, it is found that a large proportion of Polish and Other A8 migrants arrived within the same year as their partners. This does not necessarily mean that these individuals were already partnered together prior to migration, since the majority of individuals from these groups arrived to the UK within a short time period and therefore could have the same year of arrival. However, the findings fit with evidence on the family patterns of these groups from qualitative research. In particular, research has pointed to the trend for males from these groups to migrate first and for female partners to follow if both partners decide that this is a favourable strategy (White, 2011). White's research also found that many female partners joined their male partners in the UK very soon after arrival, often within a year, and so those represented as having the same arrival here could also fall into that category. The patterns displayed in Figure 5.12 for these groups are consistent with this trend.

For the Pakistani/Bangladeshi groups, it is interesting that even when partnered with other migrants, these individuals usually arrived to the UK before them. This practice is not gender-specific with the same pattern found for males and females. This trend could relate to visa entry requirements to the UK for these groups with it potentially easier for a partner to later join their partner, rather than to migrate together as a couple. For this group, due to the established migration networks to the UK, it is also possible that the earlier arriving partner could have migrated to the UK when younger and the migration therefore still related to marriage migration but between a '1.5 generation' individual with a first generation migrant. However, it is also possible that both individuals migrated to the UK independently of each other and entered a partnership after arrival.

The findings in this section reveal further important differences between groups and are consistent with the findings from the previous section, which suggested that the migration event may be more closely associated to partnership/family formation for the South Asian groups than for the A8 groups. A further interesting finding is that after controlling for being partnered, the experiences of males and

females from the same countries of birth is very similar.

Whilst there are limitations with the measures used here, as discussed above, taking a 'couple approach' in considering partner characteristics provides further understanding of the nature of migration undertaken, maximising the potential of the available data to study the migration and family formation patterns of these groups, in the absence of longitudinal data. In Section 6.3 these partner characteristics are explored further with regards to their relationship with the probability of being a parent.

Chapter 6

Parent status

6.1 Introduction

Whilst Chapter 5 explored the partnership status of recent migrants, the analyses presented in this chapter build upon these by considering the types of families migrants are living in, with regards to whether or not they are parents. Recall from Section 3.4 that the definition of parent status used throughout this chapter is based on being a 'current parent', referred to hereafter simply as 'parent' (see Section 3.4 for further details).

This chapter first focuses on how the timing of migration relates to the likelihood of being a parent, whilst Section 6.3 analyses differences in parent status for the recent migrant group in more detail. The importance of migration timing is assessed by comparing the probabilities of being a parent amongst recent migrant, established migrant and non-migrant groups (see Section 3.4 for discussion of the definitions of migrant groupings). Assessing the importance of migration timing allows consideration of how family formation is structured within the life-course for individuals with differing migration trajectories, addressing Research Question 1 (see Chapter 1, p.3) for parent status. The analyses of recent migrants in Section 6.3 address Research Question 2 (see Chapter 1, p.3) for parent status, providing insight into how recent migrants will contribute to the UK population structure in their family building strategies. Whilst the definition of parent status adopted here extends beyond own children, the results are still considered with reference to the short-term hypotheses of migrant fertility (see hypotheses 5 and 6 in Table 2.1) to consider the ways in which the migration process might relate to family formation for recent arrivals.

6.2 Migration timing

The probability of being a parent is analysed using a series of binomial logistic regressions (see Section 4.2.2 in Chapter 4), with separate models presented for

partnered males, partnered females and unpartnered females. These groups are modelled separately, given that their experiences are likely to differ, allowing consideration of how covariates relate to parent status for different groups. Unpartnered males are omitted from the analyses in this chapter because the numbers of lone fathers are found to be very small for the different migrant groups analysed here, reflecting their minority status within the wider population. The samples and covariates used within the modelling and the results of the modelling are discussed in each of the relevant sections. More general discussion and interpretation of the results is reserved until Section 6.2.5, where it is easier to discuss similarities and differences in the findings across sections, without repetition. Analyses are presented for partnered females in Section 6.2.2, for partnered males in Section 6.2.3 and for unpartnered females in Section 6.2.4.

6.2.1 Exploratory analyses

The samples analysed consist of 46,035 partnered females, 36,306 partnered males and 37,606 unpartnered females[1]. Before presenting findings from the regression models, it is useful to examine the distribution of the covariates to be included in the models, as shown in Table 6.1, to understand what the relative importance of different characteristics might be. The covariates included in the regression models are: age at survey (five year groupings), migrant status (based on duration of residence and birth region) and years of education. The economic activity status variable is not included in the female models here due to the issue of reverse causation, since it is likely that many females are economically inactive as a result of having children, and it is not possible to establish the ordering of events (i.e. whether economic inactivity or becoming a parent occurred first) because the Labour Force Survey data used is cross-sectional. Employment status is included within the model for males, however.

The patterns observed for partnered males and females are fairly similar. The migrant status variable, broken into duration of residence and region of birth categories, shows the large number of non-migrants in the group, as would again be expected, and fairly sizeable numbers for each of the other groups. The most interesting thing to observe here is that amongst established migrants, the Asian born group is the largest; whilst, amongst recent migrants, the European born group is the largest. This emphases the compositional change in flow that is of interest

[1]The definition of unpartnered used here is the same as that used previously, whereby individuals are defined as unpartnered if they are not living with a partner. Whilst it is possible that these individuals may have partners with whom they do not live, it is not possible to detect such relationships for all individuals with Labour Force Survey data.

Table 6.1: Distribution of key characteristics and percentages who are parents, for partnered females, partnered males and unpartnered females

	Partnered females		**Partnered males**		**Unpartnered females**	
	% Parents[a]	*(Total n)*[b]	% Parents	*(Total n)*	% Parents	*(Total n)*
Age at survey (years):						
20-24	37.6	*(7,494)*	33.2	*(4,284)*	15.1	*(16,990)*
25-29	47.5	*(16,082)*	40.0	*(12,171)*	31.8	*(11,087)*
30-34	69.8	*(22,459)*	62.6	*(19,851)*	49.3	*(9,529)*
Duration of residence & region of birth:						
UK-born non-migrant	56.7	*(38,438)*	51.6	*(31,020)*	28.5	*(33,271)*
$\geq$6 years: Europe	55.9	*(1,196)*	50.1	*(832)*	31.1	*(743)*
$\geq$6 years: Asia	76.3	*(1,485)*	70.3	*(1,025)*	27.1	*(581)*
$\geq$6 years: Other	58.7	*(964)*	51.8	*(743)*	37.5	*(889)*
$\leq$5 years: Europe	33.6	*(1,579)*	33.9	*(1,126)*	8.58	*(902)*
$\leq$5 years: Asia	56.2	*(1,326)*	48.8	*(822)*	9.54	*(486)*
$\leq$5 years: Other	41.8	*(1,047)*	36.9	*(738)*	17.2	*(734)*
Years of education:						
$<$11	78.4	*(2,664)*	68.4	*(2,311)*	68.7	*(2,562)*
11-13	65.3	*(26,808)*	58.1	*(22,009)*	40.4	*(19,657)*
$\geq$14	38.9	*(16,563)*	36.1	*(11,986)*	7.09	*(15,387)*
Economic activity[c]:						
Employed			49.9	*(33,173)*		
Unemployed			65.4	*(1,391)*		
Inactive			74.4	*(1,362)*		
Full-time student			26.3	*(380)*		

Source: UK Labour Force Survey, April-June Quarters 2001-2009;
n=46,035 partnered females; n=36,306 partnered males; n=37,606 unpartnered females.
[a] Weighted percentages. [b] Unweighted totals for each category.
[c] Economic activity status is included in the regression for partnered males only.
For each sub-sample, Pearson chi-square tests of association find each variable to be statistically significantly associated with parent status at the 0.1% significance level ($p<0.001$).

within this research and also reiterates the importance of controlling for birth region when comparing established and recent migrants, to account for this change. The years of education variable shows that relatively few of the individuals have less than 11 years of education, with the majority having 11-13 years of education, and a substantial proportion also having 14 years or above. For males, the majority are employed.

The distribution of migrant status for unpartnered females differs from the patterns seen for the partnered female and male groups, with the largest of the established migrant (resident in the UK for six or more years) groups being the Other group and the Asian group actually being the smallest here, whilst for partnered individuals it was the largest of the established groups. This could reflect the greater likelihood of being partnered at ages 20-34 years for the established Asian female migrants in comparison to the European and Other groups, and therefore their lower representation within this sample.

Amongst all groups, the general relationship with being a parent, for each of the covariates shown in Table 6.1, is that the proportions are higher with age, lower with increasing years of education and higher for the established migrants in comparison to comparable recent migrants. However, any real interpretation of these findings should be avoided here because they are bivariate associations and do not control for the influence of other important variables, such as the different age composition of the migrant groups and how the education patterns may be masked by the large number of non-migrants in the sample. It is more informative to now move to the multivariate analysis, where it is possible to control for mediating variables whilst assessing the importance of covariates, and to also test for interaction effects which indicate that covariates may relate to the probability of being a parent differently between groups.

6.2.2 Partnered females

The findings from the logistic regressions are presented in Table 6.2. The first model includes age and migrant status, the second model considers the impact of adding the years of education variable to the first model, and the third model presents the results for all main effects and statistically significant two-way interaction terms.

In Model 1, the association between age at survey and the odds of being a parent is as expected with the odds increasing as age increases. The duration of residence and region of birth compositional variable (migrant status; see Section 3.4 for further details of its derivation) reveals interesting findings, with recent mi-

Table 6.2: Log-odds of being a parent: For partnered females aged 20-34 years, by duration of residence in the UK

	(1) Demographics		(2) Model 1 + Education		(3) Model 2 + interactions	
Constant	-0.471^{***}	(0.024)	0.405^{***}	(0.057)	0.816^{***}	(0.104)
Age group (years)						
(ref: 20-24)						
25-29	0.400^{***}	(0.029)	0.583^{***}	(0.030)	0.219	(0.133)
30-34	1.315^{***}	(0.028)	1.497^{***}	(0.030)	0.887^{***}	(0.131)
Duration of residence & birth region						
(ref: UK-born)						
≥6 years: Europe	-0.151^{*}	(0.064)	0.077	(0.066)	0.043	(0.067)
≥6 years: Asia	0.828^{***}	(0.067)	0.941^{***}	(0.069)	0.933^{***}	(0.070)
≥6 years: Other	-0.086	(0.070)	0.196^{**}	(0.074)	0.163^{*}	(0.075)
≤5 years: Europe	-0.784^{***}	(0.056)	-0.395^{***}	(0.061)	-0.378^{***}	(0.063)
≤5 years: Asia	0.130^{*}	(0.061)	0.457^{***}	(0.064)	-0.233	(0.191)
≤5 years: Other	-0.506^{***}	(0.065)	-0.200^{**}	(0.068)	-0.203^{**}	(0.071)
Years of education						
(ref: <11)						
11-13			-0.644^{***}	(0.055)	-0.990^{***}	(0.108)
14+			-1.830^{***}	(0.056)	-2.609^{***}	(0.120)
Age*Years of education						
25-29*11-13					0.405^{**}	(0.138)
25-29*14+					0.563^{***}	(0.148)
30-34*11-13					0.411^{**}	(0.136)
30-34*14+					1.166^{***}	(0.145)
Duration of residence & birth region*Years of education						
≤5 years: Asia*11-13					0.733^{**}	(0.224)
≤5 years: Asia*14+					1.017^{***}	(0.200)
Duration of residence & birth region*Age						
≤5 years: Asia*30-34					-0.441^{***}	(0.130)
Observations	46,035		46,035		46,035	
Pseudo R^2	0.061		0.118		0.122	

Source: UK Labour Force Survey, April-June Quarters 2001-2009

Robust standard errors in parentheses

Level of statistical significance: * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

grants (resident in the UK 0-5 years at the time of survey) having lower odds of being parents than established migrants (resident in the UK 6+ years at the time of survey) from the same region of birth. For example, established Asian born migrants have 2.29 greater odds of being a parent than UK-born individuals, whilst for recent Asian migrants, the odds are only 1.14 greater than those of the UK-born group. This pattern holds for European, Asian and Other groups and supports the findings from the bivariate analyses in Table 6.1, after age has been controlled for.

The lower odds of being a parent amongst recently arriving individuals in comparison to individuals who arrived over five years ago provide support for the disruption hypothesis (Hypothesis 5 in Table 2.1), whereby parenthood is delayed as a result of migration, with recent migrants having lower odds of being parents in comparison to individuals of the same age, sex and partnership status but with different migration experiences. However, there are many factors other than age, sex and partnership status that could explain the observed differences between these groups, rather than the migration experience itself.

In terms of the differences between key migrant groups by region of birth, Asian born migrants have the highest odds of being a parent in comparison to all other groups, including the UK-born group. Migrants born in Europe and Other countries all have lower odds of being parents than the UK-born group, except amongst the established Other group, for whom the difference with the UK-born group is not statistically significant.

Model 2, presented in Table 6.2, allows consideration of the association between being a parent and migrant status after controlling for educational differences between the migrant groups. The association between education and the odds of being a parent are in accordance with previous findings, whereby the odds decrease as the number of years spent in education increases. For example, in comparison to individuals with 14+ years of education, the odds of being a parent are 6.23 and 3.27 times greater for those with less than 11 and 11-13 years of education, respectively.

After controlling for education, established European migrants are found to no longer have statistically significantly different odds of being a parent than the UK-born group. For all other coefficients, the statistical significance has remained the same or increased. The relative patterns between groups remain largely the same as those found in Model 1, with Asian born migrants having higher odds of being parents than the UK-born group, and all other groups having lower odds of being parents. An exception to this pattern occurs for the established Other group who have higher odds (1.22) than the UK-born, now that educational differences have been controlled for.

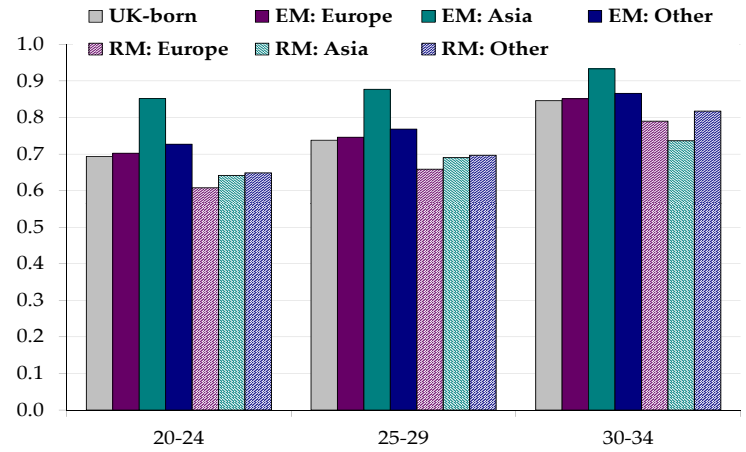
With regards to differences between recently arriving and more established migrants, individuals arriving to the UK within the past five years still have lower odds of being parents in comparison to individuals who were born in the same region but who arrived over five years ago, after controlling for years of education; with findings continuing to provide support for the disruption hypothesis. However, whilst such differences between earlier and recent arrivals do persist, they have decreased in Model 2, suggesting that education differentials do *partially* explain the observed differences found between groups in Model 1.

The extent to which the inclusion of the educational variable reduced such differences varied between groups, suggesting education may be more important for some migrant groups than others. For example, in Model 1 the odds of being a parent in comparison to recent migrants from the same birth region are 1.88 times higher for established European migrants, 2.01 times higher for established Asian migrants and 1.52 times greater for established Other migrants. By contrast, in Model 2, where years of education are controlled for, the odds for established migrants in comparison to recent migrants are 1.60, 1.62 and 1.49 times higher for European, Asian and Other migrants, respectively. Thus, the biggest reduction in odds between Models 1 and 2 is seen for the Asian group, followed by the European group and finally the Other group.

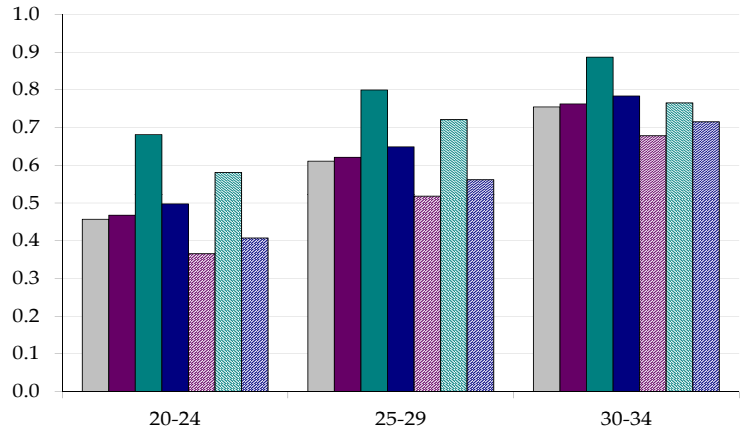
In Model 3, presented in Table 6.2, two-way interaction terms between the main effects were tested within the model to assess whether any of the observed trends operate differently amongst different sub-groups. Statistically significant interactions were found between age at survey and years of education; years of education amongst recent Asian migrants; and ages 30-34 years for recent Asian migrants. The predicted probabilities for these groups are shown in Figure 6.1, with three separate figures for the levels of the years of education variable.

By comparing within migrant and education groups but across age categories in Figure 6.1, it is evident that the probability of being a parent increases with age for all groups. This effect is slightly lessened for recent Asian born migrants as there is a negative coefficient for the interaction with age 30-34 years. However, this does not change the relative patterns between groups, with Asian migrants still having higher probabilities of being parents than all other groups, but acts to slightly reduce the magnitude of the effect for the oldest age group, suggesting that it is most pronounced for those in their twenties amongst this migrant grouping. This could be due to earlier entry into parenthood amongst this group, in comparison to the other groups.

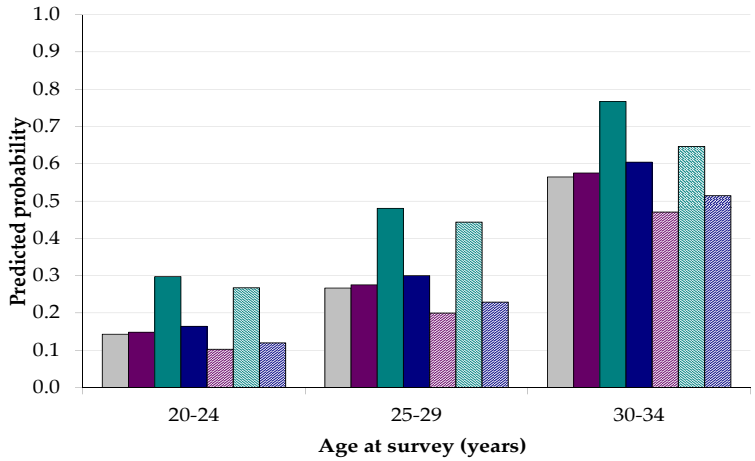
A comparison across Figures (a), (b) and (c) for each education level, but within age and migrant groupings, highlights the importance of education for the prob-



(a) <11 years of education



(b) 11-13 years of education



(c) ≥14 years of education

EM = Established migrant (resident in the UK ≥6 years at time of survey)
RM = Recent migrant (resident in the UK ≤5 years at time of survey)

Figure 6.1: Predicted probabilities of being a parent for partnered females aged 20-34 years, by years of education and migrant status and birth region

ability of being a parent. It is visible that increases in the number of years spent in education are associated with decreased probabilities of being a parent for most groups. The effect of the interaction terms between age at survey and years spent in education is demonstrated by the fact that the probabilities of being a parent increase *within* each level of education grouping as age at survey increases.

In general terms, the probability of being a parent decreases as the number of years of education increases for all migrant groupings. However, there is one exception to this general trend, found amongst the recent Asian migrants. The interaction terms between being a recent Asian migrant and years of education reveal that education is not associated with the probability of being a parent in the usual way for this particular group, with higher years of education being positively associated with the probability of being a parent. This is visible in Figure 6.1 where in Figure (a), the recent Asian migrants have very similar probabilities to other recent migrants, at the less than 11 years of education level. However, in Figures (b) and (c), the recent Asian migrant group have much higher probabilities than recent arrivals from other regions of birth. This is found to be especially the case for the 20-24 and 25-29 years age group, with the pattern still evident but less pronounced for the 30-34 years age group, highlighting the effect of the interaction term between age 30-34 years and this migrant grouping.

6.2.3 Partnered males

The multivariate analyses are presented in Table 6.3. Model 1 includes age at survey and duration of residence and birth region, Model 2 introduces covariates for years of education and economic activity, and Model 3 presents the existing main effects along with statistically significant two-way interaction terms between these main effects.

Model 1 (Table 6.3) shows that the pattern for age is as expected with increasing odds of being a parent as age increases, with 1.34 and 3.29 greater odds for the 25-29 and 30-34 age groups respectively, in comparison to those aged 20-24 years. The migrant status variable provides similar findings to those found for the partnered females (see Table 6.2) in the respect that the odds for the recent migrant groups, in comparison to the UK born, are always smaller than those of comparable established migrants, which may suggest delayed entry to parenthood amongst the recent migrant groups and is consistent with the disruption hypothesis.

The patterns for most migrant groups are similar to those seen for partnered females, with European and Other migrants from recent groups having lower odds of being parents than the UK-born, whilst the established Asian group have greater

Table 6.3: Log-odds of being a parent: For partnered males aged 20-34 years, by duration of residence in the UK

	(1) Demographics		(2) Education & economic activity		(3) Interactions	
Constant	-0.665^{***}	(0.033)	-0.234^{***}	(0.058)	-0.181^{**}	(0.059)
Age at survey (years)						
(ref: 20-24)						
25-29	0.292^{***}	(0.037)	0.446^{***}	(0.038)	0.490^{***}	(0.040)
30-34	1.192^{***}	(0.036)	1.365^{***}	(0.037)	1.261^{***}	(0.041)
Duration of residence & birth region						
(ref: UK-born)						
≥6 years: Europe	-0.142	(0.074)	-0.007	(0.078)	-0.015	(0.078)
≥6 years: Asia	0.700^{***}	(0.074)	0.843^{***}	(0.077)	0.850^{***}	(0.079)
≥6 years: Other	-0.119	(0.076)	0.128	(0.081)	-1.065^{*}	(0.445)
≤5 years: Europe	-0.581^{***}	(0.064)	-0.294^{***}	(0.070)	-0.716^{***}	(0.106)
≤5 years: Asia	-0.093	(0.074)	0.236^{**}	(0.080)	0.031	(0.141)
≤5 years: Other	-0.547^{***}	(0.079)	-0.294^{***}	(0.084)	-0.353^{***}	(0.087)
Years of education						
(ref: <11)						
11-13			-0.369^{***}	(0.052)	-0.376^{***}	(0.051)
14+			-1.296^{***}	(0.054)	-1.646^{***}	(0.062)
Economic activity						
(ref: Employed)						
Unemployed			0.705^{***}	(0.064)	0.922^{***}	(0.079)
Inactive			0.950^{***}	(0.071)	1.223^{***}	(0.097)
Full-time student			-0.488^{***}	(0.127)	-0.602^{***}	(0.142)
Age at survey*Years of education						
30-34*14+					0.521^{***}	(0.051)
Duration of residence & birth region*Years of education						
≤5 years: Europe*14+					0.760^{***}	(0.137)
≤5 years: Asia*14+					0.401^{*}	(0.168)
Duration of residence & birth region*Economic activity						
≤5 years: Asia*Inactive					-0.794^{**}	(0.295)
≤5 years: Other*Full-time student					1.390^{***}	(0.346)
Age at survey*Economic activity						
30-34*Unemployed					-0.602^{***}	(0.126)
30-34*Inactive					-0.496^{***}	(0.138)
Duration of residence & birth region*Age at survey						
≥6 years: Other*25-29					1.227^{**}	(0.474)
≥6 years: Other*30-34					1.265^{**}	(0.456)
Observations	36,306		36,306		36,306	
Pseudo R^2	0.050		0.094		0.099	

Source: UK Labour Force Survey, April-June Quarters 2001-2009

Robust standard errors in parentheses

Level of statistical significance: * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

odds than the UK-born. However, a key difference that emerges between the previous findings for the partnered females and the current findings for the partnered males is that amongst the recent male migrants, the odds for the Asian born group are not statistically significantly different from those for the UK-born. By contrast, the odds for recent Asian females were higher than the UK-born. A further difference that emerges is for the established European group, who for the partnered females had lower odds of being a parent than the UK-born, but for the partnered males are not statistically different from the UK-born group.

In Model 2 (Table 6.3), the relationships between the years of education and economic activity status variables with being a parent can be seen. As would be expected, the odds of being a parent decrease as years of education increase, as was also seen for the partnered females. The economic activity status variable shows that the odds of being a parent are higher for the unemployed and inactive groups, and lower for the full-time student group, in comparison to those who are in employment.

The change in the migrant status variable from Model 1 to Model 2 highlights the importance of controlling for years of education and economic activity. With the inclusion of these variables, the recent Asian migrant group now have statistically significantly higher odds (1.27) of being a parent than the UK-born group, making their patterns consistent with those seen for the partnered females from the same group. Other than the change for the recent Asian group, the patterns for the remaining migrant groups are largely the same between Models 1 and 2, with established European and Other groups not statistically significantly different to the UK-born, higher odds for the established Asian migrants and lower odds for the recent European and Other migrants, in comparison to the UK-born. However, the magnitude of the odds altered slightly, with a decrease in the odds for the recent Europe group, in comparison to the UK-born group, suggesting that education and economic activity partially accounted for the observed differences in Model 1. By contrast, those of the established and recent Asian groups increased, suggesting that being a parent is strongly related to education and economic activity for these two groups[2].

After controlling for education and economic activity in Model 2, there is still evidence for a delayed entry into parenthood amongst the recent migrant groups, in comparison to established groups from the same region of origin. However, the odds ratios do decrease slightly for the Europe and Asia groups between Models 1 and 2 when comparing the established and recent groups, suggesting *some* of

[2]When the main effects are tested within the model building stages, it is seen that the years of education variable is responsible for the changes in pattern for the Asian groups.

the 'disruption' effect was explained by differences in the education and economic activity characteristics of established and recent groups. The biggest reduction was seen for the Asian group, as was also found for the partnered females, followed by the European group, and no change was found for the Other group. For example, the odds of established migrants in comparison to recent migrants were 1.55 times higher in Model 1 for European migrants, compared to 1.33 in Model 2. For Asian migrants, the respective odds are 2.21 and 1.83, whilst for the Other group the odds are 1.53 in both models.

In Model 3 (Table 6.3), statistically significant two-way interactions were found between: age 30-34 years and 14+ years of education; 14+ years of education and being a recent migrant from Asia or Europe; economic inactivity and recent Asian migrant; full-time student and recent Other migrant; age 30-34 years and being unemployed or economically inactive; established Other migrant and ages 25-29 or 30-34 years. The effects of these different interactions can be viewed in Figures 6.2 and 6.3, which plot the predicted probabilities of different migrant groups by years of education and economic activity status, respectively.

In many of the results shown in Figures 6.2 and 6.3, it can be seen that there is continuing evidence for a 'disruption effect', with lower probabilities of being a parent for recent migrants in comparison to established migrants from the same birth regions. However, the interaction terms included in the model reveal that there are a number of important and interesting exceptions to this pattern. Firstly, for the Other group, at ages 20-24 years the probability of being a parent is highest amongst recent migrants, whilst the probabilities are higher amongst established migrants at ages 25-29 and 30-34 years. This is not due to particularly high probabilities for the recent Other group, but rather due to very low probabilities for the established Other group at ages 20-24 years, resulting from the interaction terms between established Other and ages 25-29 and 30-34 years. Entry to parenthood appears to occur at later ages for this particular group.

A further exception to the 'disruption' pattern is found for recent Europeans with 14+ years of education, where it can be seen in Figure 6.2 (c) that the probabilities of being a parent are marginally higher in comparison to established European migrants of the same age group and educational level. Thus, for the recent European group, higher education does not appear to delay entry to parenthood in the same way as it does for other groups. An interaction effect is also found between 14+ years of education and being a recent Asian migrant, the effect of which can also be seen in Figure 6.2 (c) where the recent Asian migrant group have higher probabilities than the established Other group at all ages, rather than just at ages 20-24 years. However, the effect for the recent Asian group is not so large, meaning

that whilst it reduces the difference between established and recent migrants, the probabilities of the established Asian group are still the highest.

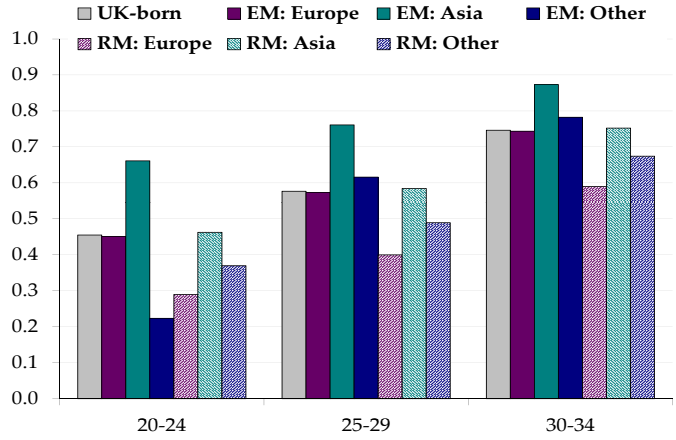
The interaction between migrant status and education was also found for recent Asian migrants in the analyses of partnered females in Section 6.2.2, although the effects found there were larger and extended to the 11-13 years of education group also. Nevertheless, it suggests that for recent Asian migrants, of both sexes who are partnered, that higher levels of education do not necessarily delay entry into parenthood. The finding for the recent European highly educated males found here was not found for the female migrants in the previous section, suggesting that this is specific to males for this group.

The final exception to the disruption pattern is found for the recent Other group amongst those who are full-time students. Whilst for all other groups, being a full-time student is associated with very low probabilities of being a parent, for the recent Other migrants the probabilities are the highest of all the full-time student groups, as seen in Figure 6.3 (d). Therefore, for this group, participation in full-time education does not seem to be associated with delayed entry to parenthood.

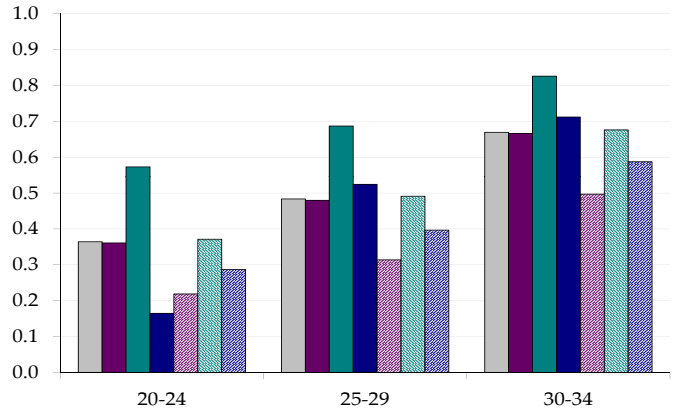
For the majority of groups, other than the three examples outlined above, the probabilities of being a parent are lower for those who have recently migrated in comparison to those with different migration trajectories but from the same birth regions. However, the interaction effects included in Model 3 in Table 6.3 reveal further important patterns for the relationship between the observed characteristics and the probability of being a parent.

The interaction between age 30-34 years and 14+ years of education suggests that the decreasing effect of higher education on the probability of being a parent is lessened at older ages. This is visible in Figure 6.2 (c) where the differences between the 30-34 years age group and younger age groups are most pronounced due to the low probabilities at younger ages for those with 14+ years of education.

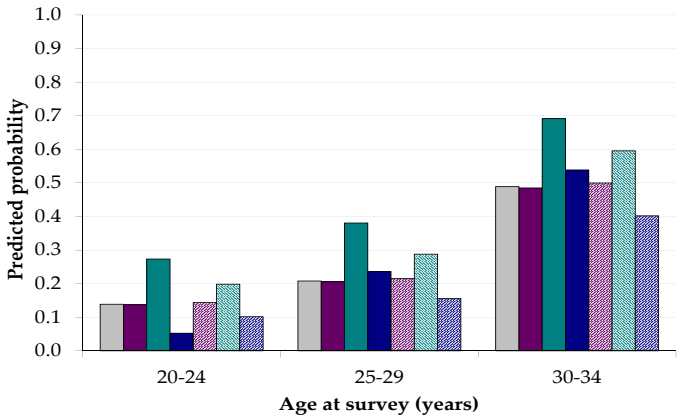
The interaction between education and age is similar to the finding for the partnered females where interaction terms were found between the older age groups and higher levels of education (see Model 3, Table 6.2). However, in the case of the partnered females, this effect was found for those aged 25-29 and 30-34 years, as well as for those with 11-13 and 14+ years of education. Meanwhile, for the partnered males here, this effect is only statistically significant for those aged 30-34 years with 14+ years of education, suggesting that the effect of higher education on decreasing the probability of being a parent lasts longer for the partnered males



(a) <11 years of education



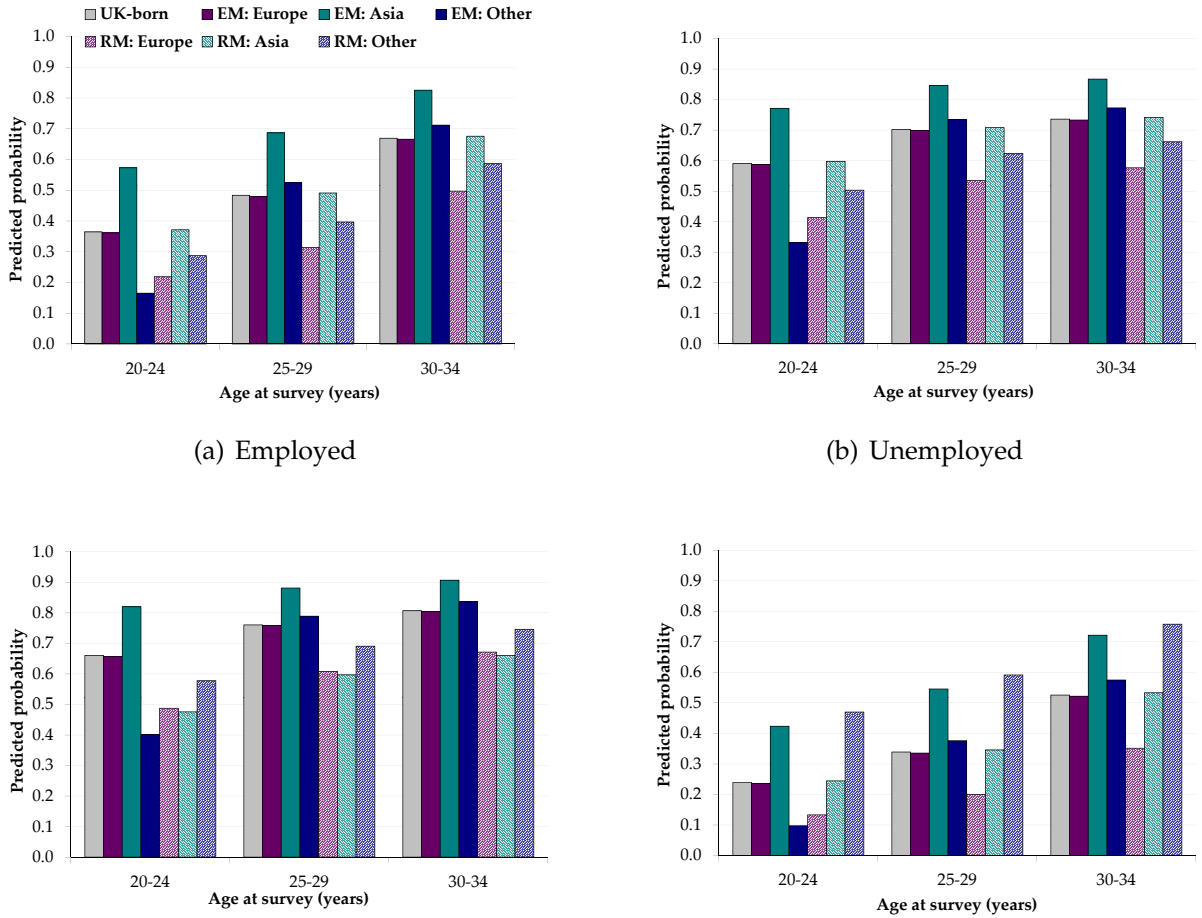
(b) 11-13 years of education



(c) ≥14 years of education

EM = Established migrant (resident in the UK ≥6 years at time of survey)
RM = Recent migrant (resident in the UK ≤5 years at time of survey)

Figure 6.2: Predicted probabilities of being a parent for partnered males aged 20-34 years and in employment, by years of education and migrant status and birth region



(a) Employed

(b) Unemployed

(c) Inactive

(d) Full-time student

EM = Established migrant (resident in the UK ≥6 years at time of survey); RM = Recent migrant (resident in the UK ≤5 years at time of survey)

Figure 6.3: Predicted probabilities of being a parent for partnered males aged 20-34 years with 11-13 years of education, by economic activity status and migrant status and birth region

in comparison to the partnered females, although the education effect is initially greater for females and the female model does not include economic activity so it is difficult to draw direct comparisons.

The probabilities of being a parent, by levels of economic activity status, are shown in Figure 6.3, where it is evident that the probabilities are typically higher for the economically inactive (c) and unemployed (b) groups, and lowest for the full-time student groups (d). However, the previously discussed interaction between full-time student and recent Other migrant status means that the probabilities are not characteristically low for this group, as they are for the other full-time student groups. The recent Other full-time students have higher probabilities than the recent Other migrant employed groups at the same ages, for all ages. In addition, the interaction effects between the 30-34 years age group with the unemployed and inactive groups, which act to decrease the probabilities of these groups at older ages, mean that the recent Other migrant group who are full-time students have equal or higher probabilities than all recent Other migrants at ages 30-34 years with different economic activity statuses.

The effects of the interactions between age 30-34 years and the unemployed and economic inactivity groups can be seen in Figures 6.3 (b) and (c), where unlike for other groups, the probabilities do not particularly increase with the increase from ages 25-29 to 30-34 years. This suggests that the relationship between inactivity or unemployment and the probability of being a parent is stronger at younger ages with the probabilities of the 30-34 years groups comparable to those of the 25-29 years groups of the same economic activity status. One further interaction with economic activity was found for the recent Asian migrant group with economic inactivity, where for this group inactivity is not associated with higher probabilities of being a parent, as it is for other groups. This can be seen in Figure 6.3, where the probabilities are higher for recent Asian migrants in comparison to recent European migrants across Figures (a), (b) and (d), but in Figure (c) the probabilities of the two groups are largely equal.

6.2.4 Unpartnered females

The results from the logistic regressions are presented in Table 6.4. Model 1 includes age at survey and migrant status; Model 2 adds years of education to Model 1; and, Model 3 includes all statistically significant two-way interaction terms between the main effects.

In Model 1, both age and migrant status are found to be statistically significantly associated with the probability of being a parent. Increases in age are found

Table 6.4: Log-odds of being a parent: For unpartnered females aged 20-34 years, by duration of residence in the UK

	(1) Demographics		(2) Education		(3) Interactions	
Constant	-1.676^{***}	(0.021)	0.044	(0.051)	0.246^{***}	(0.059)
Age group (years)						
(ref: 20-24)						
25-29	0.988^{***}	(0.029)	0.962^{***}	(0.031)	0.901^{***}	(0.035)
30-34	1.701^{***}	(0.030)	1.531^{***}	(0.033)	0.969^{***}	(0.099)
Duration of residence & birth region						
(ref: UK-born)						
≥6 years: Europe	−0.125	(0.085)	0.165	(0.100)	0.152	(0.099)
≥6 years: Asia	-0.251^{**}	(0.090)	0.125	(0.112)	-0.879^{*}	(0.354)
≥6 years: Other	0.158^{*}	(0.074)	0.614^{***}	(0.093)	0.266^{*}	(0.112)
≤5 years: Europe	-1.422^{***}	(0.116)	-0.856^{***}	(0.136)	-1.201^{***}	(0.173)
≤5 years: Asia	-1.414^{***}	(0.146)	-0.794^{***}	(0.169)	-0.798^{***}	(0.166)
≤5 years: Other	-0.775^{***}	(0.098)	-0.523^{***}	(0.115)	-0.765^{***}	(0.130)
Years of education						
(ref: <11)						
11-13			-1.169^{***}	(0.051)	-1.307^{***}	(0.060)
14+			-3.264^{***}	(0.057)	-3.889^{***}	(0.090)
Age at survey*Years of education						
25-29*14+					0.408^{***}	(0.091)
30-34*11-13					0.454^{***}	(0.104)
30-34*14+					1.220^{***}	(0.130)
Duration of residence & birth region*Years of education						
≤5 years: Europe*14+					0.853^{***}	(0.248)
≤5 years: Other*14+					0.759^{***}	(0.217)
≥6 years: Other*14+					0.766^{***}	(0.162)
Age at survey*Duration of residence & birth region						
25-29*≥6 years: Asia					0.994^{*}	(0.414)
30-34*≥6 years: Asia					1.367^{***}	(0.389)
Observations	37,606		37,606		37,606	
Pseudo R^2	0.089		0.231		0.235	

Source: UK Labour Force Survey, April-June Quarters 2001-2009

Robust standard errors in parentheses

Level of statistical significance: * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

to be particularly important for increasing the odds of being a lone parent, with 2.69 and 5.48 greater odds for the 25-29 and 30-34 years age groups, in comparison to the 20-24 years group. The higher odds at older ages are likely due to individuals at older ages having had more chance of having children and subsequently experiencing a relationship dissolution or becoming widowed, given that most births occur within a partnership.

Amongst the migrant groups, the recent European group have the lowest odds of being a parent. The odds of the recent Asian group are also very low, with no statistically significant difference found between this group and the recent Europeans. For all other groups, when holding the recent European group as the reference category, the odds in ascending order are: recent Other migrants (1.91), established Asian migrants (3.22), established European migrants (3.66), UK-born non-migrants (4.15) and established Other migrants (4.86). These findings suggest that the odds are lowest for recent migrant groups, followed by the established group, with the exception of the established Other migrant group whose odds are higher than those of all groups, including the UK-born.

In Model 2, it is possible to explore how years of education relates to the probability of being a parent, and whether the introduction of this variable to the model alters the existing findings. Years of education is found to be strongly negatively associated with the odds of being a lone parent, with 26.14 and 8.12 times greater odds for individuals with less than 11 and 11-13 years of education, respectively, in comparison to the group with 14+ years of education. This could be associated with earlier childbearing for the lone parent group, and therefore leaving full-time education at earlier ages, in order for these individuals to have had children and subsequently exited partnerships.

The inclusion of the years of education variable in Model 2 results in some changes to the relationship between the migrant status variable and the odds of being a parent. The odds remain lowest for the recent migrant groups, with no statistically significant difference between the three recent migrant groups, suggesting that the previous difference for the recent Other group was accounted for by differences in years of education between groups. Another important change is for the established migrant groups, who all have higher odds than the UK-born group, after controlling for educational differences. When holding the recent European group as the reference category, the odds of the UK-born are 2.35 times greater, whilst for the established European, Asian and Other groups the respective odds are 2.78, 2.67 and 4.35. Thus, for the established Other group, the odds of being a lone parent are particularly high even after controlling for differences in years of education.

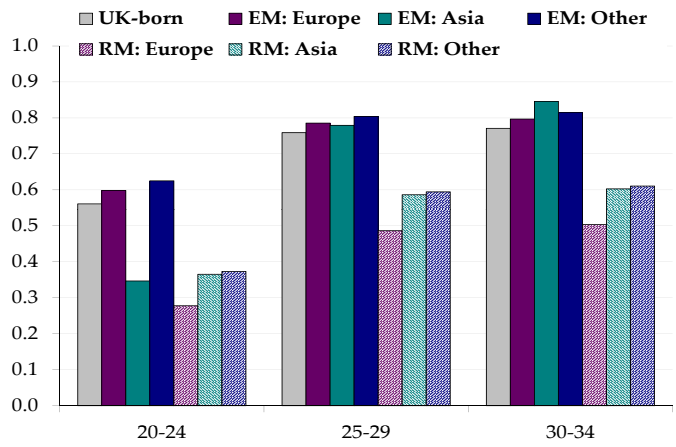
In Model 3, statistically significant two-way interaction terms are found between: 11-13 years of education and age 30-34 years; 14+ years of education with both 25-29 and 30-34 years of age; 14+ years of education and the Other group for both established and recent migrant groups, 14+ years with the recent European group; and, established Asian group with both ages 25-29 and 30-34 years. The predicted probabilities for individuals with different combinations of the covariates are shown in Figure 6.4, highlighting the differences made by the interaction effects.

The interaction effects between age group and years of education highlight that whilst higher years of education are generally associated with lower probabilities of being a parent, this effect is lessened with increases in age. This is similar to the findings for the partnered groups in the previous sections, and is likely due to the fact that at older ages individuals who have spent longer years in education have also had more opportunity for family formation after education, in comparison to individuals who are younger with comparable years of education. Furthermore, in the case of this sample, being of an older age means that one may have had more time following education to become a parent, but also to have experienced the ending of a partnership following childbearing.

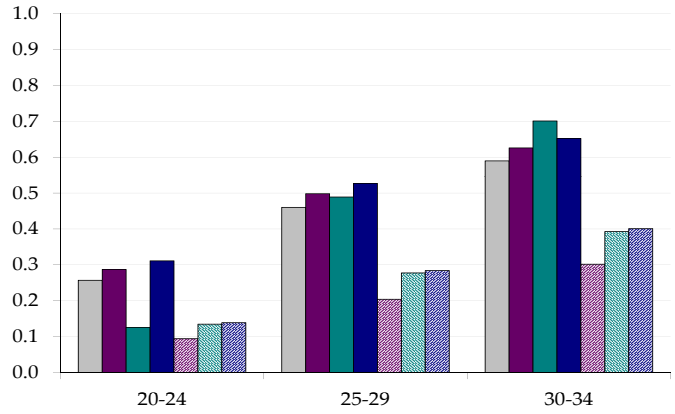
The relationship between years of education and the probability of being a parent also differs between migrant groups. For the established and recent Other groups, as well as the recent European group, the interaction effects with the highest years of education lessen the negative effects of higher education on their probabilities of being parents.

The interaction effects between ages 25-29 and 30-34 years with the established Asian migrant group result in very low probabilities for this group at ages 20-24 years but relatively high probabilities at older ages. In Figure 6.4, it is visible that at younger ages the probability of the established Asian group is lower than other established groups, whilst at 25-29 years it is very similar for all three groups and at 30-34 years, it is marginally higher for the Asian group. This shift in trend could suggest that at younger ages, established Asian migrants are less likely to be lone parents than the other established groups, but that they 'catch up' at older ages, if this trend continues beyond the age ranges considered here. This pattern is found for both the less than 11 and 11-13 years of education groups, whilst at 14+ years of education there are substantial increases for the established Asian group with age increases, but the established Other group have the highest probabilities at all ages, due to the interaction term between established Other and 14+ years of education.

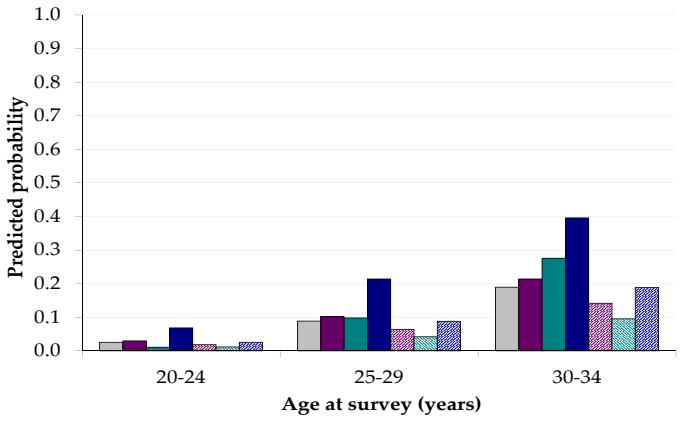
When making comparisons between the recent migrant groups, it is evident that the probabilities of the Asian and Other groups are very similar across the less



(a) <11 years of education



(b) 11-13 years of education



(c) ≥14 years of education

EM = Established migrant (resident in the UK ≥6 years at time of survey)
RM = Recent migrant (resident in the UK ≤5 years at time of survey)

Figure 6.4: Predicted probabilities of being a parent for unpartnered females aged 20-34 years, by years of education and migrant status and birth region

than 11 and 11-13 years of education groups, whilst those of the recent Europeans are the lowest. Amongst those with 14+ years of education, the recent Other group is the highest but the next highest are the recent Europeans, with the recent Asians having the lowest probabilities of those with this educational level, amongst recent migrant groups. Thus, for both the established and recent migrant groups, it is not possible to say that there is one consistent relationship with one group always having higher probabilities of being a parent than others, but rather that years of education plays an important role in mediating this relationship.

In terms of the differences between groups with different migration experiences, the recent migrant group always have lower probabilities of being lone parents than comparable established migrants, after controlling for age and years of education. The only exception to this trend is found for the Asian recent migrants at ages 20-24 years, where their probabilities are roughly the same as those of established Asian migrants, due to the very low probabilities of being a lone parent found for the 20-24 years established Asian group.

It is more difficult to attribute the lower probabilities of the recent group to a 'disruption effect' than it is amongst the partnered groups studied in previous sections, since these individuals are not partnered at the time of the survey and therefore it might not be appropriate to consider them to be 'at risk' of entering parenthood. However, the results suggest that it is less likely for the recent arrivals to be lone mothers, which could be due to the greater difficulty of making a migration for those who are lone parents, with it being more likely that individuals migrate with their families or form families after arrival to the UK and are more likely to experience the dissolution of a relationship and enter lone parenthood after longer periods of stay.

6.2.5 Discussion

The findings from Sections 6.2.2, 6.2.3 and 6.2.4 reveal many common findings across groups as well as some important differences. In this section, the discussion will firstly focus on the patterns displayed in terms of how age, years of education and economic activity status relate to the probability of being a parent for the partnered female, partnered male and unpartnered female groups; before moving on to discuss the differences found between migrant groups after controlling for these characteristics and how the patterns vary between sub-groups due to interaction effects.

In most cases, the probability of being a parent is positively associated with age for all groups. This effect is particularly strong for the unpartnered female group,

given that this group are likely to have experienced not only union formation and entry to parenthood, as have the partnered groups, but also subsequent exit from their unions, and have had more time to experience these events at older ages. For the partnered females, the increasing probabilities with age are not so strong for recent Asian migrants aged 30-34 years, which seems to indicate earlier peak entry to parenthood during the twenties for this group. Meanwhile, for the partnered males, the positive effect of age on the probability of being a parent is even stronger at older ages, due to depressed probabilities at ages 20-24 years. In particular, it would seem that for established Other males who have been in the UK for longer periods of time, their entry to parenthood is delayed until older ages, in comparison to all other established groups at ages 20-24 years. A similar pattern is found amongst the unpartnered female group, but this time for the Established Asian migrants, where the probability of being a parent is very low at ages 20-24 years, but appears to 'catch-up' at older ages, in comparison to other groups. It could be that because the majority of this group originate from Bangladesh, India and Pakistan, where amongst many groups union dissolution is a less normative behaviour than it is amongst European born groups, individuals from these countries remain in relationships longer before experiencing relationship dissolution or may exit relationships due to widowhood.

For all groups, years of education is found to be negatively associated with the probability of being a parent, as is commonly found in other studies. This is likely due to the fact that individuals tend to wait until leaving education to enter parenthood and if they have spent more years in education their entry to parenthood will be delayed as a result[3]. This is supported by the fact that interaction terms were found between age and education across all three sections, likely due to the fact that at older ages it is possible to have attained higher levels of education and to have left the education system for sufficient periods of time to allow family formation. This could to some extent indicate a recuperation effect (e.g. Goldstein et al., 2009; Kohler et al., 2002) following an exit from the education system. For the partnered females, interaction terms were found for ages 25-29 and 30-34 years with 11-13 and 14+ years of education, whilst for the partnered males the interaction was only found for those aged 30-34 years with 14+ education, suggesting a greater delay for the highly educated males. The interactions were found for age 25-29 with 14+ years and 30-34 with 11-13 and 14+ years of education for the unpartnered females, suggesting that, like the partnered females, their entry to parenthood may be more accelerated than that of males, following education. However, it should also be noted that education does not have such a negative re-

[3]It is of course also possible that reverse causation could operate for the relationship between education and parenthood, with individuals leaving the education system to have children or form families.

lationship with parenthood probabilities for the partnered males initially as it does for the partnered and unpartnered females.

Whilst education is generally found to be negatively associated with the probability of being a parent, this effect is less strong for some migrant groups. Amongst the partnered females and partnered males, the negative effect of higher education is lessened for the recent Asian migrants. This is also found to be the case for recent European partnered male migrants, but not for the partnered females, suggesting there is a gender divide for this group. Amongst the unpartnered females, the effect of higher education is also lessened for Other migrants from the established and recent groups, as well as recent European migrants. Thus, for each of these cases, it would appear that education does not act to delay parenthood to the same extent as it does for other groups. With the recently arriving groups, this could be due to the type of migration undertaken by the highly-skilled groups from these origins, if their migration is more permanent or family-related, in comparison to lower-skilled migrants who may engage in temporary or circular migration. Alternatively, it could be that education does not act in the same way for these groups since they are a selected group (e.g. Chiswick, 2000), requiring certain resources to be able to migrate so although they are more highly educated, their migration may still be related to family formation or moving with families.

Economic activity status is only included in the regressions for the partnered males, to avoid issues with reverse causation amongst the female samples. It is found that unemployment and economic inactivity are generally associated with higher probabilities of being a parent, whilst full-time students have the lowest probabilities. The high probabilities of being parents for the unemployed and inactive groups peak around ages 25-29 years, with little increase in the probabilities between this group and the age 30-34 years group. These patterns do not apply for two of the recent migrant groups, however. Firstly, for the recent Other group, being a full-time student is associated with high probabilities of being a parent, with this group having higher probabilities than all other full-time students. It would appear for those who have recently migrated as students, that participation in education may be associated with bringing one's family to the UK with them, or that family formation is not delayed as a result of migration. Secondly, for the recent Asian group, economic inactivity is not associated with high probabilities of being a parent as it is in the same way for other groups, with recent Asian migrants having very low probabilities of being parents in comparison to other inactive groups.

Evidence in support of the disruption hypothesis (Hypothesis 5 in Table 2.1) was found for all of the partnered female groups, when comparing recent migrants to established migrants from the same birth region. For the unpartnered females,

the only group for which the disruption effect was not found was amongst Asian migrants aged 20-24 years, due to the very low probabilities of being lone parents amongst established Asian migrants at this age. Likewise, for the partnered males, a disruptive effect was not seen for Other migrants aged 20-24 years, due to the very low probabilities of the established group at this age. Two other exceptions are found for the partnered males group, which appear to be due to the high probabilities of the recent migrant groups, rather than depressed probabilities of the established groups. Firstly, recent European migrants with 14+ years of education are found to have very similar probabilities to established European migrants with the same educational level. Secondly, recent Other migrants who are full-time students are found to have very high probabilities of being parents. For these particular groups, migration appears to be more closely tied with becoming a parent or migrating with one's family. The findings suggest that the timing of migration is important for the timing of family formation within the life-course for recent migrants to the UK, who tend to have lower probabilities of being parents than other groups in the majority of cases.

Whilst the probabilities of recent migrants are generally lower than those of established migrants, this should not be taken as support for the idea that the probabilities of recent migrants are always necessarily low. Amongst many of the groups, quite high probabilities of being parents are found. Amongst partnered females with less than 11 years of education, the recent Other group always has the highest probabilities in comparison to other recent groups, followed by the Asian group, except at age 30-34 years where the recent Asian group has the lowest probability. For partnered females with 11-13 years and 14+ years of education, the recent Asian group has very high probabilities of being a parent in comparison to the other recent migrant groups, with this effect lessened at ages 30-34 years. This reflects both the earlier entry into parenthood of this group and also how highly educated Asian female migrants are still parents, given that they are also partnered. This is supported by the fact that at less than 11 years of education, the recent Asian group has lower probabilities of being a parent than the UK-born group, but at higher levels of education they have higher probabilities. The probabilities for recent Other and European groups are always lower than the UK-born for the partnered females.

For the partnered males, across educational levels, the recent Asian group always have the highest probabilities of the recent groups, whilst the Europeans have the lowest, except at 14+ years of education where their probabilities are much closer to those of the Asian born group. Thus, highly educated European males seem more likely to migrate with their families or form families shortly after migration, in comparison to those with fewer years of education from the same

region. At 14+ years of education, recent Asian migrants have greater probabilities than the UK-born group, whilst for lower educational levels they are comparable. Those of the recent European group are comparable to those of the UK-born group at 14+ years of education, whilst they are lower for lower levels of education; and, the Other group have lower probabilities across all educational levels in comparison to the UK-born.

The recent Asian migrants have the highest probabilities of partnered males amongst the employed and unemployed groups, whilst the Europeans have the lowest. The probabilities of the two groups are similar for the economically inactive, and for full-time students the Other group have by far the highest probabilities of recent migrants and the European group by far the lowest. This suggests that for the recent European group, migration for educational purposes is not very often tied with family migration or formation, whilst the opposite is found for recent Other migrants. Amongst those who are employed or unemployed, the recent Asian group have similar probabilities to the UK-born, whilst those of the European and Other recent migrants are lower. For the inactive group, the UK-born have higher probabilities than all recent migrants, and for the full-time student group, the probabilities are lower, comparable and higher for the recent European, Asian and Other groups, respectively, in comparison to the UK-born.

Finally, for the unpartnered females, the recent Asian and Other groups have similar probabilities of being parents at less than 11 and 11-13 years of education, but the Asians have lower probabilities at 14+ years of education. The recent European group always have the lowest probabilities of being lone parents in comparison to other recent groups, except at 14+ years of education, but the probabilities are very small for all groups at this level of education. For all recent groups, the probabilities of being lone parents are always lower than those of the UK-born group.

This section reveals that for most groups recent migration to the UK is associated with a lower probability of being a parent, in comparison to those with different migration trajectories, when controlling for partnership status. However, there are a few exceptions, as outlined above, where parenthood does not seem to be as greatly delayed in comparison to other groups, particularly for highly educated, partnered male migrants from Europe and Asia and female migrants from Asia. For these groups, migration appears to be more closely associated with family formation. In the next section, differences between recent migrants will be explored in more detail to consider further whether the findings for these highly educated groups provide any support for family formation related migration, and hence the interrelation of events hypothesis (Hypothesis 6 in Table 2.1). However, amongst

all other groups the findings here are consistent with the disruption hypothesis (Hypothesis 5 in Table 2.1). Further insight into whether this is the case is given in Chapter 7, where the timing of births in relation to migration is explored, as the analyses here simply refer to being a parent and thus, could also represent families who migrated together (rather than family formation migration) or alternatively the greater likelihood to migrate of those who do not have children or to have initially left children at origin (rather than disruption effects operating). Nonetheless, regardless of the underlying mechanisms, the results here suggest the different types of recent migrants who are likely to be living in families with dependent children and those that are not.

6.3 Recent migrants

6.3.1 Introduction

This section builds upon the findings presented in Section 6.2, by exploring the parent status of the recent migrant group in more detail. Recent migrants are defined as individuals who have been resident in the UK for five or fewer years at the time of survey (see Section 3.4 for more detail on migrant status definitions). The aim of the section is to consider how the probability of being a parent may differ between different groups, extending the analyses to account for country of birth and duration of residence, providing further insight into the family structures of individuals who have very recently arrived to the UK. The analyses within this section address Research Question 2 (see Chapter 1, p.3) and relate to the research theme of comparing the experience of recent migrants originating from recently established flows to the UK (Poland and Other A8 groups) with recent arrivals originating from countries with longer established migratory links to the UK (Bangladesh, India and Pakistan).

Partner characteristics are also considered here, with regards to whether they are related to the probability of being a parent. The aim of this analysis is to consider whether the characteristics of one's partner affect the probability of being a parent, given that existing studies have suggested that inter-ethnic relationships may be taken to indicate greater assimilation to host country norms (e.g. Ishizawa and Stevens, 2010; Coleman, 1994). Here, the study considers whether this is also found to be true for individuals who are earlier in their migration careers (i.e. as opposed to settled first-generation or second generation migrants), having only very recently arrived to the UK. This is also of interest because the majority of children are born within a couple, but many of the migration-fertility hypotheses (see

Table 2.1) refer to the mother's migration experience and offer little explanation for the importance of father's characteristics, when their migration history differs from that of the mother.

Exploratory analyses are presented in Section 6.3.2 and regression analyses are presented separately for partnered females in Section 6.3.3 and partnered males in Section 6.3.4. Unpartnered females are omitted from the analyses here, due to the low probabilities of being parents found for all recent migrants in this group in the previous section. More general interpretation is reserved for the discussion in Section 6.3.5, where the findings from across the three sections are considered.

6.3.2 Exploratory analysis

There are 3,829 partnered females and 2,594 partnered males in the samples analysed in these sections. The covariates included in the regression models for these two groups are: age at survey; years of education; country of birth; duration of residence in the UK and partner's migrant status. As before, economic activity is included in the model for males, but not for females due to the issue of reverse causation. The distribution of these variables and their relationship with parent status is shown in Table 6.5.

The distribution of the years of education variable highlights that many of the females are highly skilled, with 14+ years of education, followed by 11-13 years and with very few having less than 11 years of education. A similar pattern is found for males, except that slightly more have 11-13 years of education, closely followed by those with 14+ years. The vast majority of males are employed[4]. The largest country of birth grouping is for the Other category since this encompasses all countries not individually focused on here; but amongst the key countries of interest, the largest group are the Polish born, followed by the Indian born, with smaller numbers for Other A8, Bangladeshi and Pakistani migrants, amongst both sexes. This highlights the growing size of the Polish population amongst young recent migrants since A8 accession in 2004.

The majority of migrants have been resident in the UK for 2-3 years at the time of survey, followed by those resident for 4-5 years and finally, those who arrived in the last 0-1 years. This is not surprising given that the Labour Force Survey is a private household survey and therefore it might be more likely to sample individuals after they have been resident for a while, in comparison to those very recently

[4]Note that the employed variable used here has been grouped into employed versus all other categories, due to the small number of recent male migrants who are both partnered and out of employment.

Table 6.5: Distribution of key characteristics and percentages who are parents, amongst partnered female and male recent migrants

	Females		**Males**	
	% Parents[a]	*(Total n)*[b]	% Parents	*(Total n)*
Age at survey (years):				
20-24	32.9	*(858)*	22.3	*(342)*
25-29	38.5	*(1,703)*	31.5	*(1,143)*
30-34	59.6	*(1,268)*	54.4	*(1,109)*
Years of education				
<11	67.9	*(300)*	56.5	*(185)*
11-13	52.0	*(1,049)*	44.5	*(753)*
≥14	37.5	*(2,480)*	35.6	*(631)*
Country of birth:				
Poland	36.9	*(520)*	34.2	*(442)*
Other A8	31.6	*(224)*	35.5	*(150)*
Pakistan & Bangladesh	71.9	*(297)*	64.0	*(237)*
India	53.4	*(422)*	42.5	*(281)*
Other	41.4	*(2,366)*	37.5	*(1,484)*
Duration of residence in the UK (years)				
0-1	33.5	*(1,035)*	28.5	*(636)*
2-3	43.5	*(1,539)*	40.1	*(1,089)*
4-5	52.6	*(1,255)*	47.2	*(869)*
Employment status[c]				
Employed			38.1	*(2,213)*
Not employed			49.0	*(381)*
Partner's migrant status				
UK-born	31.6	*(959)*	43.6	*(506)*
Migrant: Arrived before	55.0	*(1,245)*	42.4	*(420)*
Migrant: Same arrival	42.0	*(1,409)*	36.4	*(1,204)*
Migrant: Arrived after	40.9	*(216)*	41.8	*(464)*

Source: UK Labour Force Survey, April-June Quarters 2001-2009;
n=3,829 partnered females; n=2,594 partnered males.
[a] Weighted percentages. [b] Unweighted totals for each category.
[c] Employment status is included in the regression for partnered males only.
For both sub-samples, Pearson chi-square tests of association find each variable to be statistically significantly associated with parent status at the 0.1% significance level ($p<0.001$).

arriving, though the numbers in each group are sizeable. Finally, the majority of recent migrants are found to be partnered with migrants who arrived in the same time period. For females, the next most common category is to have partners who arrived before them, and then those who are UK-born. Whilst for males, the next most common category is to have UK-born partners, followed by migrant partners who arrived after them. Thus, the profiles of the two sexes seem to complement each other fairly well (as seen for some groups in Figures 5.11 and 5.12).

The bivariate relationships between parenthood and the characteristics explored in Table 6.5 show that the percentages who are parents: increase with age; decrease with increasing years of education; are higher for those from Bangladesh and Pakistan and lowest for those from Poland and Other A8 countries; and, increase with duration of residence. For females, higher proportions are parents when partnered with other migrants, in comparison to those partnered with non-migrants. For males, the proportions who are parents are comparable across partner types, except amongst those who arrived in the same period, for whom the proportions are lower. For males, higher proportions are partnered amongst those not in employment, in comparison to those who are employed. These patterns are explored further using multivariate analyses for partnered females in Section 6.3.3 and partnered males in Section 6.3.4.

6.3.3 Partnered females

The findings from the logistic regression modelling for the partnered, female, recent migrants are presented in Table 6.6. Model 1 includes controls for age at survey and years of education, with country of birth and duration of residence in the UK variables. Model 2 introduces partner's migration status to Model 1, and Model 3 includes statistically significant two-way interactions between main effects.

The results from Model 1 are largely as would be expected, with greater odds of being a parent at older ages, with increasing duration of residence in the UK and with fewer years of education. The findings for country of birth are interesting because important differences are found between groups, even after controlling for being partnered and therefore accounting for differential partnership probabilities. The odds of being a parent are 3.35, and 1.60 times higher for females from Bangladesh/Pakistan and India, in comparison to Polish females. The odds of being a parent are not found to be statistically significantly different to those of the Polish females for females from Other Asia and Other Rest of World (ROW) groups. Lower parenthood odds are found for Other A8 and Other European fe-

Table 6.6: Log-odds of being a parent: Partnered, female recent migrants aged 20-34 years

	(1) Demographics		(2) Partner characteristics		(3) Interactions	
Constant	−0.361	(0.194)	−1.299***	(0.215)	−2.248***	(0.327)
Age at survey (years)						
(ref: 20-24)						
25-29	0.534***	(0.098)	0.546***	(0.101)	0.410**	(0.125)
30-34	1.419***	(0.106)	1.443***	(0.108)	1.729***	(0.204)
Country of birth (COB)						
(ref: Poland)						
Other A8	−0.586**	(0.188)	−0.536**	(0.195)	−0.146	(0.211)
Pakistan & Bangladesh	1.191***	(0.177)	1.373***	(0.184)	1.557***	(0.198)
India	0.487***	(0.140)	0.526***	(0.145)	0.738*	(0.367)
Other Europe	−0.612***	(0.128)	−0.437***	(0.132)	1.427***	(0.414)
Other Asia	0.139	(0.133)	0.257	(0.136)	1.310***	(0.389)
Other Rest of World (ROW)	−0.144	(0.118)	0.002	(0.121)	1.417***	(0.428)
Duration of residence (years)						
(ref: 0-1)						
2-3 years	0.418***	(0.090)	0.522***	(0.092)	0.574***	(0.119)
4-5 years	0.699***	(0.094)	0.856***	(0.098)	0.901***	(0.127)
Years of education						
(ref: <11)						
11-13 years	−0.484**	(0.162)	−0.436**	(0.160)	0.431	(0.272)
14+ years	−1.274***	(0.155)	−1.265***	(0.152)	−0.078	(0.274)
Partner's migrant status & arrival						
(ref: UK-born)						
Migrant: Before			1.130***	(0.104)	1.108***	(0.102)
Migrant: Same			0.802***	(0.102)	0.288	(0.196)
Migrant: After			0.342*	(0.162)	−0.468	(0.309)
Age*COB						
30-34*Other A8					−0.963**	(0.362)
30-34*Other Europe					−0.490*	(0.200)
Age*Duration of residence						
30-34*2-3yrs					−0.546**	(0.206)
30-34*4-5yrs					−0.529*	(0.213)
Age*Partner's migrant status						
25-29*Migrant: Same					0.502*	(0.212)
30-34*Migrant: Same					0.750**	(0.229)
30-34*Migrant: After					0.644*	(0.327)
COB*Duration of residence						
India*2-3yrs					0.898**	(0.299)
India*4-5yrs					1.026**	(0.321)
COB*Years of education						
India*14+					−1.107**	(0.341)
Other Europe*11-13					−1.474***	(0.443)
Other Europe*14+					−1.950***	(0.424)
Other Asia*11-13					−1.017*	(0.424)
Other Asia*14+					−1.223**	(0.400)
Other ROW*11-13					−1.272**	(0.438)
Other ROW*14+					−1.618***	(0.432)
COB*Partner's migrant status						
Other ROW*Migrant: After					0.875**	(0.326)
Observations	3,829		3,829		3,829	
Pseudo R^2	0.114		0.140		0.157	

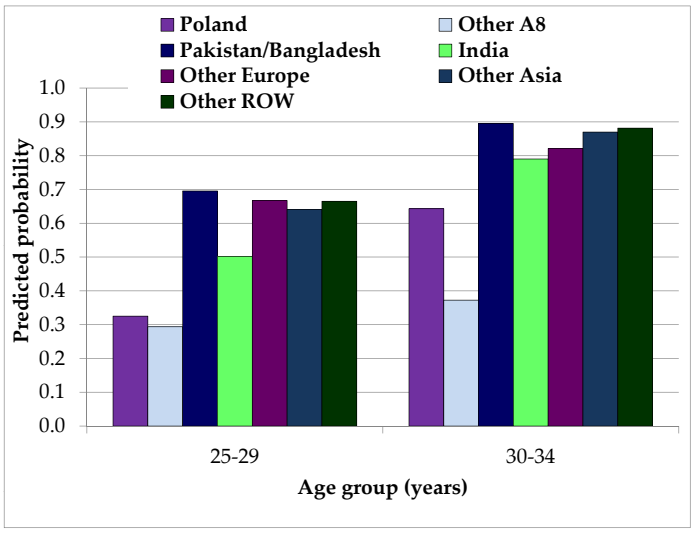
Source: UK Labour Force Survey, April-June Quarters 2001-2009
Robust standard errors in parentheses
Level of statistical significance: * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

males. It is especially interesting to find that the Polish group again appear to be different to the Other A8 group and Other Europeans, as was also found in Chapter 5 with regards to partnership status.

In Model 2, partner's migrant status is found to be statistically significantly associated with the odds of being a parent. Individuals who are partnered with UK-born individuals have the lowest odds of being parents, with 3.10, 2.23 and 1.41 higher odds for those with migrant partners who arrived before them, within the same year and after them, respectively. After adding partner characteristics to Model 2, the relative relationships between the other covariates and the odds of being a parent remain the same.

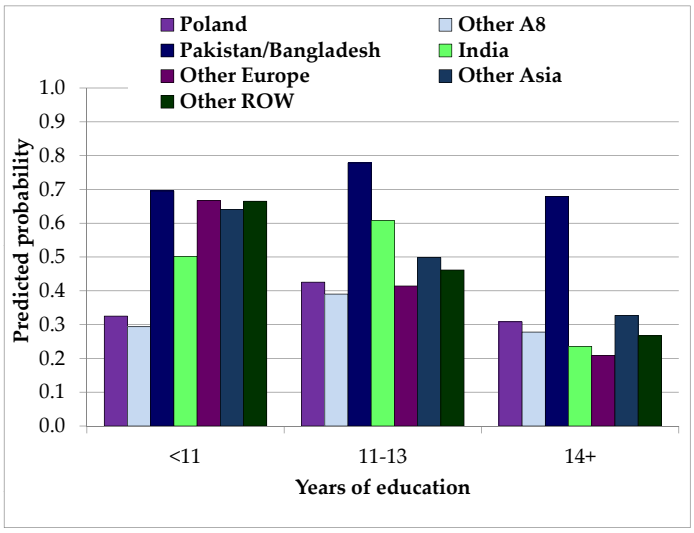
In Model 3, statistically significant two-way interactions are found for age at survey with country of birth, duration of residence and partner's migrant status, and for country of birth with duration of residence, years of education and partner's migrant status. In Figure 6.5, the predicted probabilities are shown by age and country of birth. Ages 20-24 years are omitted here because the relative patterns between groups are the same as found at ages 25-29 years, because only ages 30-34 years are found to interact with particular countries of birth. It can be seen that amongst those aged 25-29 years, the Pakistani/Bangladeshi females have the highest parenthood probabilities, followed closely by the 'Other' groupings. The Indian females are in between these groups and the Polish and Other A8 groups have the lowest probabilities. At ages 30-34 years, the same patterns largely remain, except that the probability of the Other A8 group is now substantially lower than for Polish females, and the Other Europe group have a lower probability more comparable to that of Indian females. This suggests that for the A8 and Other European females, migrating at younger ages is associated with being a parent, more so than for females who migrate at older ages. Due to the freedom of movement within the EU for these groups, it is possible that older females from these countries have older dependent children who have not migrated with them, but interestingly this pattern is not found for the Polish females. The probabilities shown in Figure 6.5 are calculated whilst holding educational level constant but the effect of education varies between groups also, as shown in Figure 6.6.

The effect of education is not found to differ for Polish, Other A8 and Pakistani/Bangladeshi groups and therefore the relative patterns between groups observed in Figure 6.5 are consistent across levels of education for females from these countries. For these groups, the probabilities of being a parent are highest amongst those with 11-13 years of education and comparable amongst those with <11 and 14+ years of education, though marginally higher for the <11 years group. For the 'Other' groupings, education is found to be negatively associated with the proba-



Predicted probabilities are calculated for individuals who have been resident in the UK for 0-1 years, have <11 years of education and who are partnered with migrants who arrived before them.

Figure 6.5: Predicted probabilities of being a parent for partnered females, by age and country of birth



Predicted probabilities are calculated for individuals who have been resident in the UK for 0-1 years and who are partnered with migrants who arrived before them.

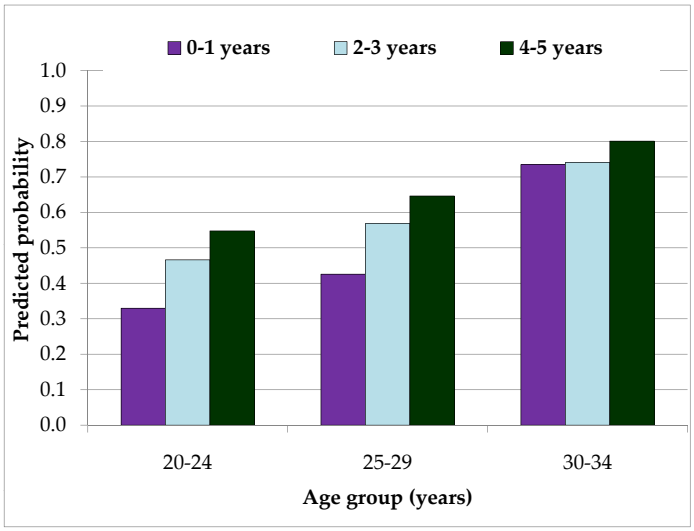
Figure 6.6: Predicted probabilities of being a parent for partnered females aged 25-29 years, by country of birth and years of education

bility of being a parent. An education interaction is also found for Indian females but only for those with 14+ years of education, whose probabilities are the second lowest of all groups at this educational level.

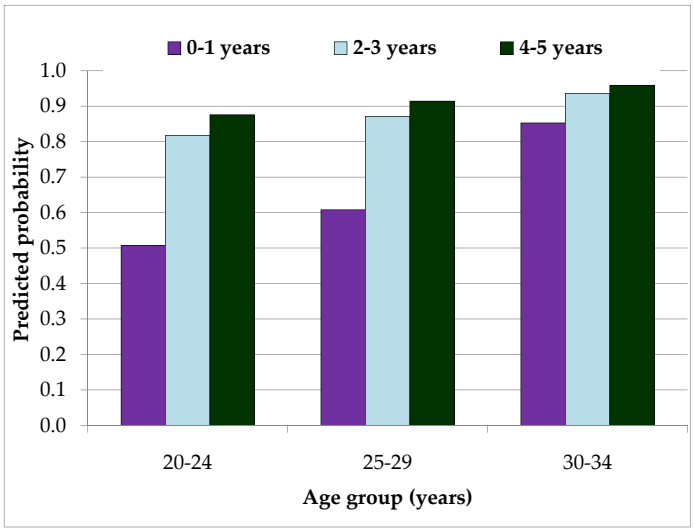
These results are consistent with those of findings in the previous chapters where education is not always negatively associated with parent status, as one might expect (e.g. Rendall et al., 2005; Berrington, 2004). Two explanations seem plausible for this pattern. Firstly, it could be that the result arises due to the measure of education used, since the <11 years category refers to lower than compulsory education, it represents a small minority and the migration of these 'low-skilled' groups could be quite different in nature to that of other groups. This would fit with the fact that the probabilities are lower for the 14+ years group in comparison to the 11-13 years group. However, a second potential explanation is that for these groups, they are those that have been selected into migration (e.g Chiswick, 2000) directly or indirectly associated with being in or forming a family and therefore education does not have the same negative effect often observed in relation to fertility patterns. This explanation is supported by the fact that for the 'Other' comparison groups, who have not been identified as necessarily having high levels of childbearing or engaging in family formation related migration, there is a clear negative association with years of education and parenthood probabilities, with the highest probabilities found for the <11 years group.

A further important consideration for the Indian females is that the comparisons of country of birth and education levels in Figures 6.5 and 6.6 are calculated for individuals who have been resident in the UK for 0-1 years at the time of survey, but for Indian females there is an interaction with duration of residence in the UK. The importance of this can be seen in Figure 6.7 by comparing (a) Polish and (b) Indian females. Note that India is the only country of birth found to interact with duration of residence and so the example of Polish females illustrates how duration of residence relates to parent probabilities for all other countries of birth. For Polish and Indian females, the parent probabilities increase with duration of residence in the UK, but this is found to be particularly pronounced for Indian females. At 0-1 years of residence, the probabilities of Indian females are very low in comparison to those at 2-3 and 4-5 years. For female partnered recent Indian migrants to the UK, entry to parenthood appears to not be closely associated with the migration event, but rather delayed following arrival. Thus, the relative patterns shown between countries of birth in the previous graphs differ dependent on duration of residence in the UK. For Indian females who have been resident in the UK for 2-3 and 4-5 years, their parent probabilities are comparable to those of Pakistani/Bangladeshi females, holding all else constant, except at 14+ years of education due to the lower probabilities found for highly educated Indian females.

The relationship between duration of residence and parent probabilities is far less pronounced for all groups at ages 30-34 years, however, suggesting less delay in entry to parenthood after arrival or a greater tendency to migrate with children at older ages.



(a) Country of birth: Poland



(b) Country of birth: India

Predicted probabilities are calculated for individuals with 11-13 years of education and who are partnered with migrants who arrived before them.

Figure 6.7: Predicted probabilities of being a parent for partnered female, recent migrants aged 20-34 years, by duration of residence in the UK

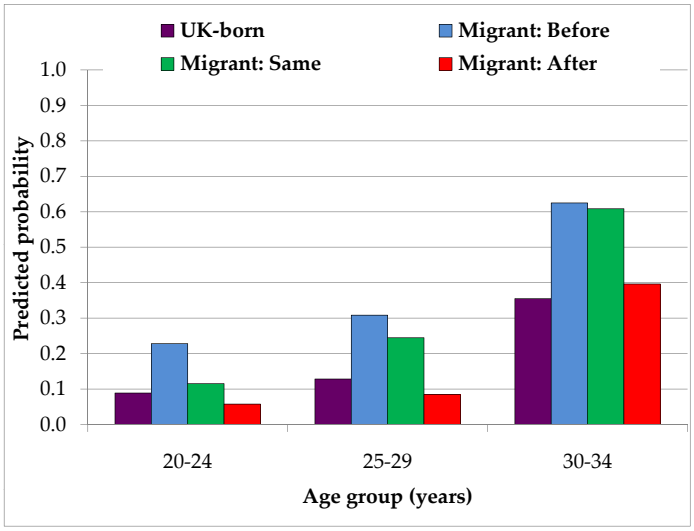
Finally, the relationship between the probability of being a parent and partner's migrant status is illustrated in Figure 6.8. The relationship shown for Polish females (a) represents how partner's migrant status relates to parent probabilities for all countries of birth, except for the Other Rest of World (b) group, whose patterns are shown separately. The graph for Polish females shows that the lowest parent probabilities are found for individuals with a partner who arrived after

them or who was born in the UK. At ages 20-24 years, the probabilities are highest for females whose partners arrived before them, likely reflecting family reunification. This has important implications because Figure 5.12 showed that substantial proportions of all females are partnered with migrants who arrived before them, suggesting that this type of migration occurs for all of the countries of interest here. At ages 25-29 and 30-34 years the difference in the probabilities of being parents for individuals whose partner arrived before them in comparison to those who arrived within the same year as their partner decreases. Therefore, it seems that individuals who migrate together at younger ages may be more likely to do so as a couple, whilst those migrating together at older ages do so as a family unit. However, it is not possible to determine whether individuals with the same arrival year did migrate together or formed a partnership after arrival, so this could also simply reflect an age effect for this group with individuals who form partnerships at older ages more likely to also be parents.

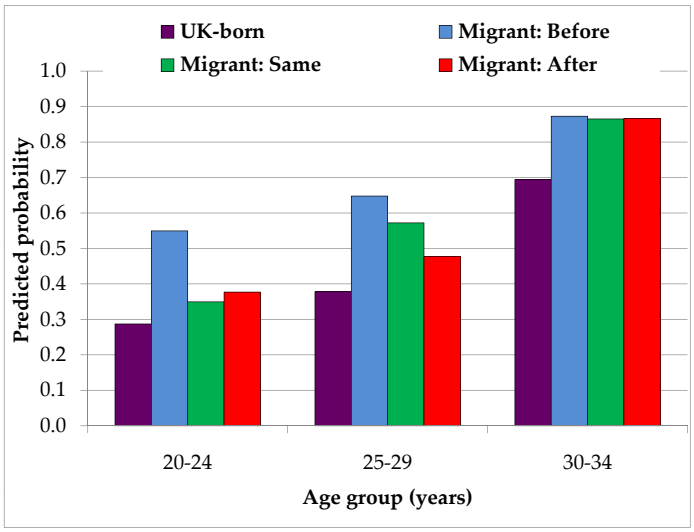
It is interesting to find that the probability of being a parent is lower for individuals partnering with UK-born individuals as it would be expected that this type of migration is related to family formation (e.g. Peach, 2006) and for probabilities to therefore be high. However, these reflect relative patterns for whether or not individuals are parents but do not capture timing of fertility in relation to migration for these groups, although the interaction between duration of residence and partner's migrant status is not found to be statistically significant. The pattern observed here may be reflecting higher parent probabilities amongst individuals with migrant partners due to already having children prior to migration, which is potentially less likely for those partnered with UK-born individuals.

The pattern for the Other Rest of World group shown in Figure 6.8(b) show comparatively high probabilities of being parents for individuals partnered with migrants whose arrival year was after their own also, especially at older ages, which could reflect a less gendered pattern in family reunification, but detailed interpretation is avoided here due to the heterogenous nature of this group, who are included only for comparison purposes.

In summary, the findings for partnered females presented in this section show that the probabilities of being a parent are especially high for Pakistani/Bangladeshi females and lower for Polish and Other A8 females, even after controlling for age, years of education, duration of residence in the UK and partner characteristics. The probabilities are especially low for Other A8 females at older ages. For Indian females the pattern is less clear, with comparably high probabilities to Bangladeshi/Pakistani females for those with longer durations of residence and lower levels of education, but much lower probabilities amongst the highly ed-



(a) Country of birth: Poland



(b) Country of birth: Other - Rest of World

Predicted probabilities are calculated for individuals with 14+ years of education, who have been resident in the UK for 0-1 years.

Figure 6.8: Predicted probabilities of being a parent for partnered female, recent migrants aged 20-34 years, by partner's migration status and arrival year to the UK (in relation to their partner).

ucated or amongst those who have recently arrived. Thus, for highly educated Indian females their migration experience may be quite different to less educated Indian females.

Furthermore, the migration event does not seem to be as closely related with parenthood for Indian females as it is amongst other groups, which could be due to greater disruption effects for this group. The difference in the parent probabilities of the Polish and Other A8 females in comparison to the probabilities of Pakistani/Bangladeshi and Indian females highlight that whilst the partnership probabilities are comparably high for all groups, the differences are much more pronounced with regards to whether or not they have children. It would not be expected that the fertility of the Polish and Other A8 females would be as high as for the South Asian groups, but this analysis merely relates to whether or not they have one or more children as it measures parenthood. This could suggest that whilst there has been an increase in live births to Polish mothers in the UK, this is due to the size of these migration groups, rather than migration particularly being associated with childbearing as it is in the same way for the South Asian countries studied here, who also feature amongst the common countries of birth for foreign-born mothers having live births in the UK. Further insight into this is gained in Chapter 7, where fertility *rates* are calculated for the Polish and South Asian groups, which control for the size of the population at risk.

6.3.4 Partnered males

The logistic regression models for the partnered males are presented in Table 6.7. As for partnered females, Model 1 includes age at survey, country of birth, duration of residence in the UK and years of education. Employment status is also included for males here. Model 2 adds partner characteristics to Model 1 and Model 3 includes statistically significant two-way interaction terms.

Model 1 shows the odds of being a parent are higher for: those not in employment; individuals at older ages; longer durations of residence; and, individuals with less than 14 years of education. In terms of the differences between countries of birth, the only groups that have statistically significantly different odds to the Polish group are Pakistani/Bangladeshi and Other European males. The Pakistani/Bangladeshi males have 2.62 time greater odds of being parents than the Polish males, whilst the Other European males have 1.43 greater odds of *not* being parents.

In Model 2, partner's migrant status is not found to be statistically significantly associated with the odds of being a parent, in contrast to the findings for females.

Table 6.7: Log-odds of being a parent: Partnered, male recent migrants aged 20-34 years

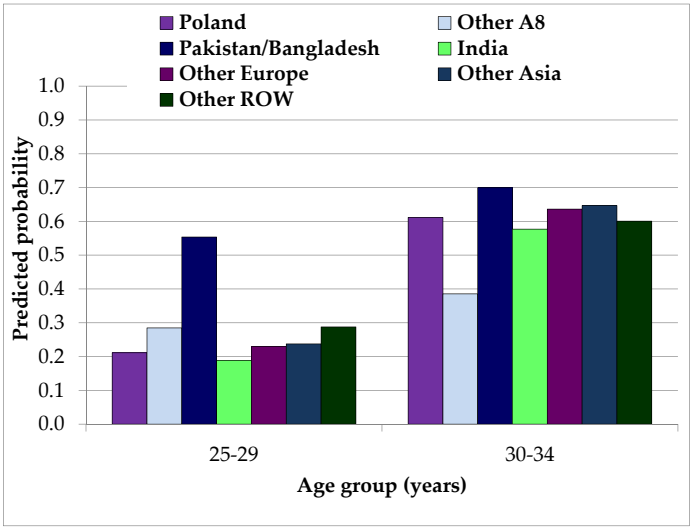
	(1) Demographics		(2) Partner characteristics		(3) Interactions	
Constant	-1.290^{***}	(0.236)	-1.312^{***}	(0.264)	-2.081^{***}	(0.297)
Age at survey (years)						
(ref: 20-24)						
25-29	0.605^{***}	(0.152)	0.608^{***}	(0.153)	0.601^{***}	(0.158)
30-34	1.649^{***}	(0.157)	1.656^{***}	(0.159)	2.372^{***}	(0.237)
Country of birth						
(ref: Poland)						
Other A8	-0.282	(0.222)	-0.283	(0.222)	0.396	(0.259)
Pakistan & Bangladesh	0.965^{***}	(0.187)	1.046^{***}	(0.204)	1.533^{***}	(0.229)
India	-0.055	(0.168)	-0.027	(0.170)	-0.144	(0.178)
Other Europe	-0.360^{*}	(0.144)	-0.343^{*}	(0.148)	0.105	(0.221)
Other Asia	-0.134	(0.172)	-0.099	(0.174)	0.150	(0.201)
Other Rest of World (ROW)	-0.230	(0.136)	-0.210	(0.140)	0.411	(0.214)
Duration of residence (years)						
(ref: 0-1)						
2-3 years	0.561^{***}	(0.114)	0.567^{***}	(0.116)	0.754^{***}	(0.166)
4-5 years	0.718^{***}	(0.119)	0.723^{***}	(0.123)	1.135^{***}	(0.179)
Years of education						
(ref: <11)						
11-13 years	-0.303	(0.184)	-0.313	(0.184)	-0.266	(0.186)
14+ years	-0.814^{***}	(0.174)	-0.824^{***}	(0.175)	-0.363	(0.205)
Employment status						
(ref: Employed)						
Not employed	0.535^{***}	(0.124)	0.526^{***}	(0.124)	1.177^{***}	(0.213)
Partner's migrant status & arrival						
(ref: UK-born)						
Migrant: Before			-0.155	(0.154)	-0.142	(0.156)
Migrant: Same			0.043	(0.131)	0.115	(0.134)
Migrant: After			0.038	(0.156)	0.429^{*}	(0.192)
Age*Country of birth						
30-34*Other A8					-1.316^{***}	(0.371)
30-34*Pakistan/Bangladesh					-1.142^{***}	(0.342)
30-34*Other ROW					-0.457^{*}	(0.209)
Age*Duration of residence						
30-34*2-3					-0.475^{*}	(0.234)
30-34*4-5					-0.561^{*}	(0.245)
Country of birth*Years of education						
Other Europe*14+					-0.791^{**}	(0.250)
Other ROW*14+					-0.633^{**}	(0.220)
Country of birth*Employment status						
Other Asia*Not employed					-0.993^{**}	(0.324)
Duration of residence*Partner's migrant status						
4-5*Migrant: After					-0.677^{**}	(0.234)
Years of education*Employment status						
14+*Not employed					-0.674^{**}	(0.261)
Observations	2,594		2,594		2,594	
Pseudo R^2	0.102		0.103		0.123	

Source: UK Labour Force Survey, April-June Quarters 2001-2009
Robust standard errors in parentheses
Level of statistical significance: * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

As would be expected, given that partner's migrant status is not statistically significant, the relative patterns in odds remain the same between levels of the covariates.

In Model 3, it is found that partner's migrant status interacts with duration of residence, although it was not found to be significant as a main effect in Model 2. Interactions are also found for country of birth with age, years of education and employment status, for duration of residence with age and for years of education with employment status.

Figure 6.9 shows the relative patterns between countries of birth, by age. Whilst the probabilities will be lower at 20-24 years, the figure for those aged 25-29 years represents the same relative patterns between groups as found at younger ages because country of birth is found to interact with age for only those aged 30-34 years. At ages below 30 years, only the Pakistani/Bangladeshi males are found to have relatively high probabilities of being parents, amongst all male partnered recent migrants. At ages 30-34 years, the Pakistani/Bangladeshi males still have the highest probabilities of being parents but for all groups, except Other A8 males, the probabilities are very similar at these ages. For the Other A8 males aged 30-34 years, the probability of being a parent remains low and having recently migrated at these ages does not appear to be associated with being a parent, or at least having any children living with them. Thus, even after controlling for the findings from the previous chapter showing the lower partnership probabilities for males in comparison to females by selecting partnered males, the probabilities of being a parent are very low for most groups, except the Pakistani/Bangladeshi males at young ages, and for other males at ages 30-34 years.



Predicted probabilities are calculated for employed individuals with 11-13 years of education, who have been resident in the UK for 0-1 years and who are partnered with migrants who arrived after them.

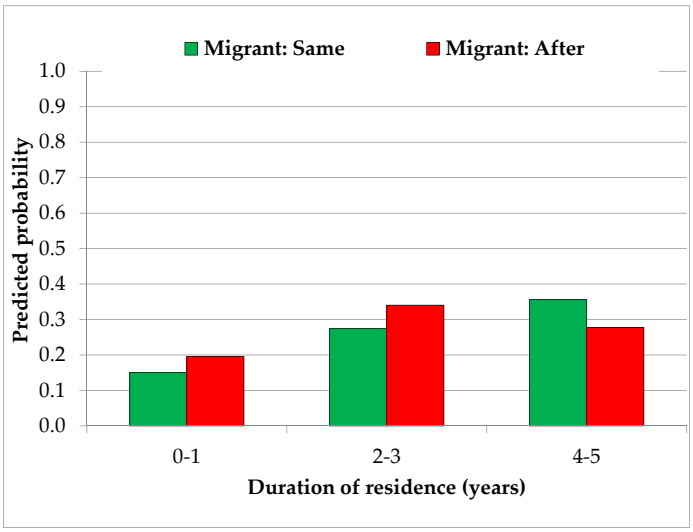
Figure 6.9: Predicted probabilities of being a parent for partnered males, by age and country of birth

The relative pattern between countries of birth shown in Figure 6.9 largely hold across educational and economic activity status groups, apart from a few exceptions. For most groups, education is not found to be statistically significantly associated with being a parent, but for Other European and Other Rest of World males the probabilities are lower than for all other groups at 14+ years of education. Education is found to be an even less important indicator for 'parenthood' here than it is for females in the previous section. This could again be due to the positive selection of highly educated individuals into migration (e.g. Chiswick, 2000) and therefore educational levels distinguishing less well between groups than they might amongst a more heterogeneous population.

The relative patterns between countries of birth are also similar for the employed and non-employed groups, with employed males having lower probabilities of being parents than those who are not in employment. However, for Other Asian males the positive effect of not being employed on the probability of being a parent is much smaller. The positive effect of non-employment is also much smaller for males with 14+ years of education, suggesting that the experience of being out of employment for highly educated males is different than it is for males with lower levels of education.

Figure 6.10 shows the predicted probabilities of being parents by partner status and duration of residence. This interaction effect is only found to be statistically significant for males with migrant partners who arrived after them, so the patterns shown for migrant partners who arrived at the same time illustrates how duration of residence relates to parent probabilities for males partnered with UK-born individuals and migrant partners who arrived before them also. The figure shows that for males partnered with other migrants who arrived after them, the probability of being a parent is higher than that of males with other partner types, up until 4-5 years of residence when the other partner types have higher probabilities. This pattern partly fits with that seen for females in the previous section, whereby parent probabilities are high when the female arrives second and is likely linked to family reunification processes. The effect of this appears to decrease with duration of residence, suggesting that family reunification occurs fairly quickly and when it takes longer it may be less likely that the couple have children. The pattern of quick family reunification supports the findings of recent qualitative research on the family patterns of Polish migrants in the UK (White, 2011).

For all groups, parent probabilities are found to increase with duration of residence in the UK, except at older ages where the differences between individuals with differing durations of residence are smaller. Thus, it may be that older males are likely to wait for less time after migration to enter parenthood, or equally that



Predicted probabilities are calculated for Polish-born, employed individuals aged 25-29 years with 14+ years of education.

Figure 6.10: Predicted probabilities of being a parent for partnered males, with migrant partners who arrived in the same year or after, by duration of residence in the UK

older males are more likely to migrate with children.

In summary, for the key countries of birth of interest, education and employment status do not really help to explain differences between groups. The most important factor associated with parent probabilities is age. At younger ages, the Pakistani/Bangladeshi males have relatively high parent probabilities, but for all other males they are low. This provides an interesting contrast to the findings for females where the probabilities were high for Indian females also. At ages 30-34 years, the probabilities of being parents are largely similar for all countries of birth, except for the Other A8 group whose probabilities are consistently low. The findings provide some consistency with those for females in the previous section, with higher parent probabilities found for the case where male partners arrived to the UK first and female partners arrived afterwards, providing possible evidence for family reunification processes.

6.3.5 Discussion

The findings for partnered female recent migrants show that the probabilities of being a parent are especially high for Pakistani/Bangladeshi females and lower for Polish and Other A8 females. The difference in the parent probabilities of the Polish and Other A8 females in comparison to the probabilities of Pakistani/Bangladeshi and Indian females highlight that whilst the partnership probabilities are comparably high for all groups, the differences are much more pronounced with regards to whether or not they have children.

The findings for partnered male recent migrants show that the most important factor associated with parent probabilities is age. At younger ages, the Pakistani/Bangladeshi males have relatively high parent probabilities, but for all other males they are low. At ages 30-34 years, the probabilities of being parents are largely similar for all countries of birth, except for the Other A8 group whose probabilities are low.

Therefore, when analysing the parent probabilities of recent migrant groups, more consistency is found according to country of origin, than it is by sex, which is opposite to the case found for partnership status. This is not surprising since we have controlled for individuals being partnered in these analyses and have also seen that the partnership types of individuals from the same countries of birth are fairly similar. For the Pakistani/Bangladeshi males and females, recent migration appears to be more closely associated with being a parent than it is for other groups. This supports existing evidence showing that the migration of these groups to the UK for family formation purposes is an important phenomenon (e.g. Charsley et al., 2012; Peach, 2006). These findings are consistent with the interrelation of events hypothesis (Hypothesis 6 in Table 2.1), but could also be attributable to a greater propensity for family reunification or moving with children, amongst these groups. The analyses in Chapter 7 allow further understanding of these patterns.

Chapter 7

Fertility patterns

7.1 Introduction

This chapter presents the findings from the application of the Own Children Methodology, to obtain estimates of fertility for the foreign-born population in the UK. These estimates provide first insights into the fertility patterns of immigrants to the UK by country of birth for the most recent time period up until 2009, whilst also addressing questions relating to the relationships between the *timing* of both migration and fertility, by focusing on different sub-samples of individuals who have recently arrived to the UK (these are accordingly described below). Recall that the research considers short-term hypotheses of 'disruption' and 'interrelation of events', which refer to the relationship between childbearing and the migration *event* (see Table 2.1).

7.2 Own Children Methodology

7.2.1 Introduction

As discussed previously in Chapter 3, the Labour Force Survey (LFS) is a valuable data source for this research because it provides information on migration related variables, whilst also offering relatively large sample sizes. However, a limitation of the LFS is that it does not have direct birth history information available, which is needed for the research questions relating to the timing of fertility amongst recent migrant groups. This limitation can be overcome by using the 'Own Child(ren) Method' (OCM; Cho, Retherford, and Choe, 1986), which is an indirect estimation technique that uses relationship information from household surveys. The method, along with modifications and improvements, is outlined in detail in Cho et al. (1986), which brings together a number of works by the authors where the OCM has been applied, particularly in situations where the data are limited.

The advantage of the OCM approach is that it allows estimation of fertility where the quality of official data are poor or lacking. This method is also useful in settings where good quality data are available but without the detail required to study specific population groups (Cho et al., 1986). This is certainly the case for this research, where official birth registration data are not available for migrants by year of arrival to the UK. Furthermore, in the UK case, it is possible to obtain relatively detailed information on births from official sources but not on the suitable denominators needed for constructing fertility rates. An advantage of applying the OCM with the LFS is that both numerator and denominator can be obtained from the same data source and, thus, subject to the same method of data collection, minimising biases arising from combining different data sources (Dubuc, 2009).

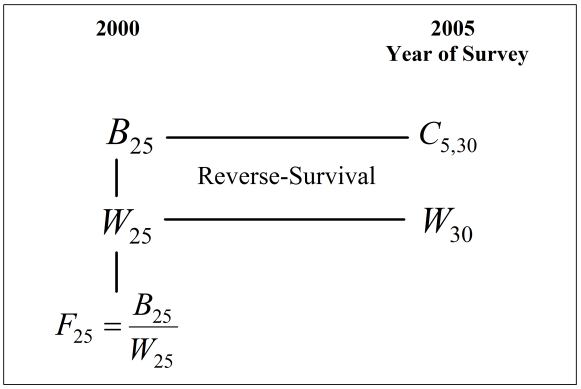
The merits of OCM for estimating fertility of minority groups within the UK have been demonstrated, with a number of studies using the LFS data. For example, Murphy and Berrington (1993) used LFS data from 1987 and 1989 to estimate period parity progression ratios; Berthoud (2001) estimated teenage fertility rates by ethnicity with data pooled from 1987-1999; and more recently, Coleman and Dubuc (2010) and Dubuc (2009) studied fertility by ethnicity and amongst the second generation in the UK from 1979-2006. This research uses OCM to analyse the fertility patterns of minority groups with a particular focus on country of birth differences for recent migrants to the UK and on duration of residence in the UK, with 2001-2009 data.

7.2.2 The Method

The OCM is a reverse-survival technique that uses current survey data to retrospectively estimate fertility for the years prior to the survey (Bordone, Billari, and Zuanna, 2009). To obtain birth estimates, the age of each child is subtracted from that of their mother and from the year of survey to give both the age of the mother at the birth of the child and the year for that age-specific birth. The number of women in the year when the age-specific birth took place is also calculated by reverse-surviving those women in the survey. Thus, a numerator and denominator can be obtained to calculate the age-specific birth rates.

A graphical example of the method is shown in Figure 7.1, which is adapted from a basic example presented by Cho et al. (1986), where $C_{5,30}$ is the number of children aged 5 years who are matched to their mothers aged 30 at the 2005 LFS and W_{30} the number of women aged 30 enumerated in the 2005 LFS. Therefore, the children $C_{5,30}$ were births five years previously B_{25}, to women aged 25 years W_{25}. The age-specific birth rate for women aged 25 in 2000, F_{25}, would therefore

be calculated as B_{25}/W_{25} (Cho et al., 1986).



Adapted from Cho, Retherford, and Choe (1986), p.2

Figure 7.1: An illustration of the basic Own-Children Method calculation of age-specific birth rates, for women aged 30 years with children aged 5 years when interviewed in the Labour Force Survey in 2005

Whilst the OCM technique allows indirect fertility estimation, there are a number of limitations of the approach to consider. One such limitation is that children are not detected if they are not living within the same household as their mother. In order to minimise any problems associated with this, Cho et al. (1986) suggest that analyses should not be conducted further than 15 years ago because any children aged 16 years and above are more likely to have left the parental home. Therefore, in this study, all estimates calculated from a particular survey year only date back to 15 years prior to the survey year and are based on children aged 15 years and under at the time of that survey. Given that the pooled sample ranges from 2001-2009, we are able to observe patterns for the period 1994-2008. Whilst it would be possible to calculate fertility estimates for as far back as 1986 on the basis of the 2001 survey data (i.e. fifteen years prior to 2001), the results would be based on smaller sample sizes and represent a period that is of less interest for these analyses. Thus, the decision was taken to start the estimates at 1994 since this is the first year for which all of the survey years contain eligible information to contribute to the numerators and denominators.

The period from 1994 to 2000 is that for which the largest sample sizes are available based on the survey years from 2001-2009. From 2001 onwards, the sample sizes diminish with each increase in year. For example, estimates for 2001 are based on 2002-2009 data, whilst estimates for 2008 are based solely on 2009 data. Thus, a higher degree of caution is required when constructing the fertility estimates for the most recent period. The survey year relating to the year of interest itself is not included in the estimation for that particular year because the estimates would be based on incomplete fertility up until the time of survey in April-June of that year. Therefore, fertility estimates are produced up until 2008.

Whether or not children are living with their mothers is of further importance in this research due to the focus on migrant mothers. The LFS does not contain information for children who did not migrate with their mothers, since it is based on who is living in the household at the time of survey. Since the migration of A8 groups to the UK is fairly recent and thought to be primarily economically driven, consisting of many short-term circular migrations, it is possible that some of the migrants may be leaving their children at home with alternative caregivers. It is not known to what extent this might be occurring as there is currently very little quantitative information available on the family patterns of these groups. There has been some media attention about the so-called 'Euro-orphans' who have been left behind whilst their parents move to Western Europe to work abroad. Whilst this issue may result in underestimation of fertility if it is a widespread phenomenon, it is something that is acknowledged and given further consideration in the interpretation of the findings[1]. Furthermore, it is still possible to analyse fertility patterns and the numbers of children living with their migrant parents in the UK, as well as those born in the UK.

Another potential problem with the OCM is that mortality is not accounted for in the estimations. However, recent studies adjusting for mortality in the UK context have shown that differences in estimates obtained are very small and negligible (Dubuc, 2009). Therefore, corrections for mortality are not made in this study.

Some of the key advantages to the OCM have been outlined in Dubuc (2009), and include the avoidance of over or under estimation of fertility when using Child-Woman Ratios, which are unable to account for different countries of birth between children and mothers. The OCM approach, on the other hand, matches all children to mothers meaning that it is only on the mother's characteristics that one needs to select information for sub-groups of interest. This is particularly important in this study of migrant mothers, where women may have given birth to children following their arrival to the UK, one of our key areas of interest.

The OCM approach also avoids overestimation of fertility which can arise in studies where migrant fertility is only measured following arrival to the destination country (Dubuc, 2009). For example, as the disruption or interrelation of events hypotheses state (Table 2.1), fertility may be elevated following migration. In this case, period based measures of fertility would be inflated, due to tempo effects (e.g. Bongaarts and Feeney, 2000, 1998). However, the OCM estimates fertility

[1]Some investigation into this issue is possible by comparing the year of arrival of mothers and their children to the UK. For the vast majority, mothers arrived in the same year as their child(ren). In the small minority of cases where mothers arrived first, the majority of children joined their mothers within 1-2 years, suggesting that underestimation will not be large for this group. However, it is not possible to detect children who never join their mothers in the UK.

for up to 15 years prior to the survey, meaning that fertility prior to migration is also estimated. Thus, any postponement of fertility prior to migration would counterbalance any elevation following arrival. Important differences such as these can be explored further within this research by relating fertility outcomes to year of arrival information.

7.2.3 OCM estimation with LFS data

It is possible to produce OCM estimates with the LFS because it is a household survey that provides information on the relationship between each household member with every other member of the household. Using the information contained within the relationship matrix, children can be linked to their own mothers. However, in order to match these individuals within the LFS, it is first necessary to complete the LFS relationship matrix, since it is only filled in a diagonal fashion. For example, the relationship matrix variables give the relationship of each household member to the previous household members already listed. Thus, for the first person in the household their relationship to all other members is not directly available from their own record but is from the records of the other members. This is illustrated in Table 7.1, which gives an example of the structure of LFS data for a simple, hypothetical case.

In Table 7.1, it can be seen that for Person 1 in Household 1 their relationship to the other three members of the household is not stated within the row for their information, whilst for Person 4 their relationship to all other household members is known. However, by using the available information it is straightforward to identify that Person 1 is the spouse of Person 2, and the father of Person 3 and Person 4 within the same household. Once the relationship matrix has been filled in so that each individual has information within their own row of data specifying their relationship to every other household member, it is then possible to match children to their mothers.

Given the level of detail available in the LFS, it is possible to link children to their mothers manually, without the need for the automated program offered by the East West Center, Honolulu (see Cho et al., 1986). The rates are then calculated by using the row of information relating to the mother and by subtracting the ages of each of her children from her age and the survey year to estimate the numerators.

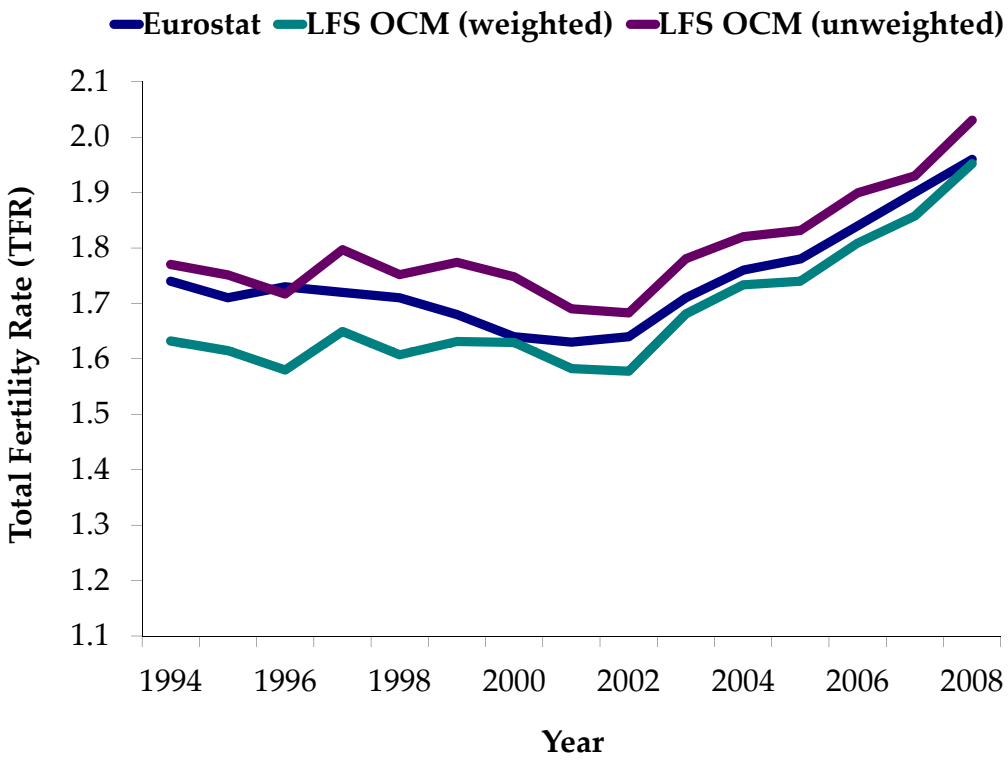
Table 7.1: Example of data structure within the Labour Force Survey (for hypothetical data), with key variables required for producing Own Children Method estimates of fertility.

Household ID *[hserial]*	**Family ID** *[fuserial]*	**Person ID** *[recno]*	**Year of Survey** *[refwky]*	**Age** *[age]*	**Sex** *[sex]*	**Relationship to Person 1** *[xr01]*	**Relationship to Person 2** *[xr02]*	**Relationship to Person 3** *[xr03]*	**Relationship to Person 4** *[xr04]*
1	11	1	2009	42	male	does not apply	does not apply	does not apply	does not apply
1	11	2	2009	38	female	spouse	does not apply	does not apply	does not apply
1	11	3	2009	12	female	natural son or daughter	natural son or daughter	does not apply	does not apply
1	11	4	2009	9	male	natural son or daughter	natural son or daughter	brother or sister	does not apply
2	21	1	2009	35	female	does not apply	does not apply	does not apply	does not apply
2	21	2	2009	37	male	cohabiting partner	does not apply	does not apply	does not apply
2	21	3	2009	12	male	step son or daughter	natural son or daughter	does not apply	does not apply
2	21	4	2009	10	male	natural son or daughter	step son or daughter	step brother or sister	does not apply

It is believed that any misallocation of children to mothers will be negligible since the LFS provides very detailed information on children within the household so that it is possible to separate out foster and step-children from their own children (see Table 7.1). The next step is to then use information for all women who would have been at the specific age of interest in the particular year of interest, to calculate the denominators. For example, if we are interested in women at risk of births at age 20 years in 2000, we would include women aged 21 years in the survey year 2001, aged 22 years in the survey year 2002 and so on.

As discussed below, the results obtained via this manual approach are identical to those obtained using the automated method. The manual approach has the additional advantage that birth information is then linked within the survey and can be related to other important characteristics of interest.

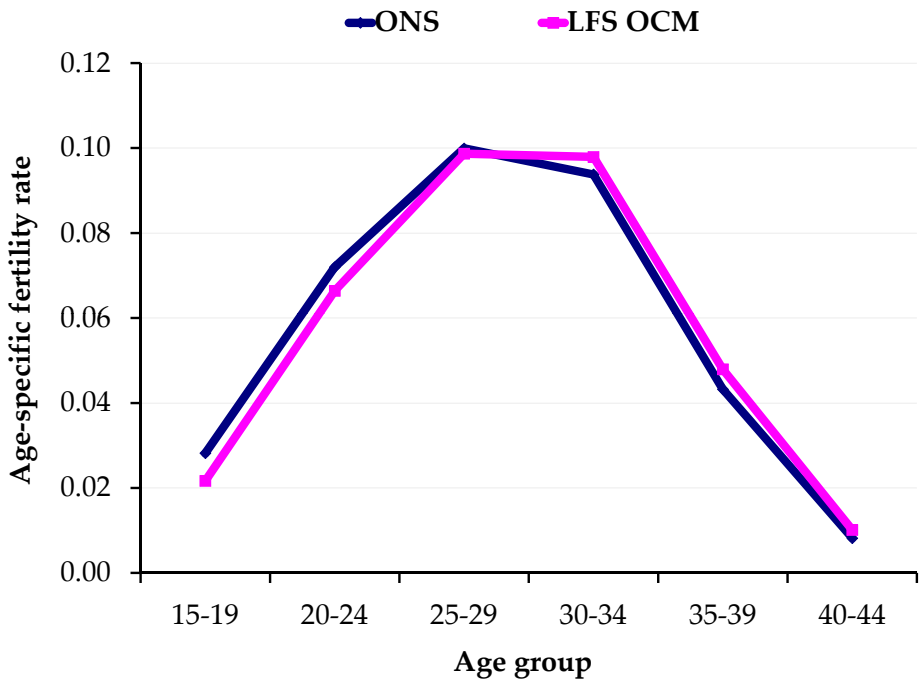
7.2.4 Reliability of OCM estimation with the LFS



Source: Eurostat; OCM estimates with LFS data

Figure 7.2: Comparison of Own Children Method (OCM) estimates of UK Total Fertility Rates (TFR) obtained with the Labour Force Survey (LFS) against official Eurostat estimates, 1994-2008

In this sub-section, OCM estimates obtained from the LFS are compared with those from official sources to assess their reliability. Figure 7.2 compares both weighted and unweighted yearly Total Fertility Rates (TFRs) for the 1994-2008



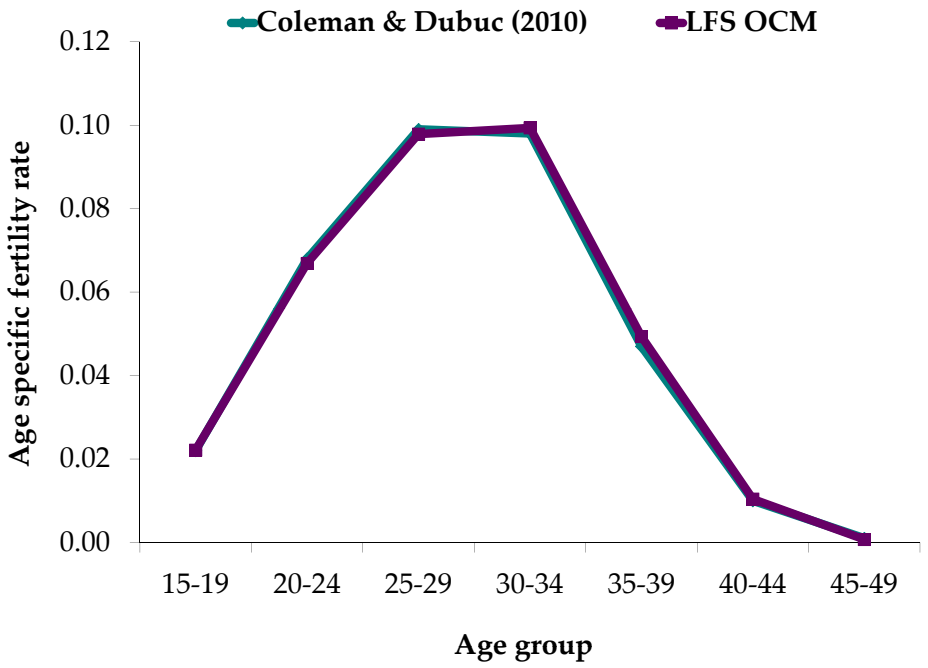
Source: Fertility and Family Analysis Unit, ONS; OCM estimates with LFS data

Figure 7.3: Comparison of Own Children Method (OCM) estimates of UK Age-Specific Fertility Rates (ASFR) obtained with the Labour Force Survey (LFS) against Office for National Statistics (ONS) estimates, 1994-2007

period with official estimates published by Eurostat. It can be seen that the LFS estimates closely approximate the Eurostat estimates, with the weighted estimates slightly underestimating fertility and the unweighted estimates slightly overestimating fertility. For the start of the period the rates are more volatile, but for the 2001 and onward periods, they closely resemble Eurostat estimates. In particular, all of the estimates reflect the recent rises in the UK TFR within the past decade (Tromans et al., 2009).

An issue for debate is whether or not it is worthwhile to weight the OCM estimates. This is not a trivial issue given the differing estimates obtained from the two approaches. As outlined in Section 3.2, the weights provided in the LFS do not explicitly correct for non-response by country of birth or other migration related characteristics. However, the weights do correct for non-response by age, sex and geographical region to make the sample more representative of the UK population. For this reason, weights are applied in the OCM analyses presented here.

Further verification of the estimates obtained with the LFS data is provided in Figure 7.3. Age-Specific Fertility Rates (ASFRs) for the 1994-2007 period are compared with those provided by the Office for National Statistics. The two estimates are very close with the LFS slightly underestimating fertility at younger ages and



Source: Coleman and Dubuc (2010); OCM estimates with LFS data

Figure 7.4: Comparison of Own Children Method (OCM) estimates of UK Age-Specific Fertility Rates (ASFR) obtained with the Labour Force Survey (LFS) against Coleman & Dubuc's (2010) estimates, 1996-2006

slightly overestimating fertility at older ages. This could reflect the fact that the LFS is a household survey and therefore may be more likely to capture older individuals within its sample. However, some of this is corrected for in the weighting, and the resulting differences are small.

Finally, a comparison of averaged ASFRs for the 1996-2006 period with those produced by Coleman and Dubuc (2010) is provided in Figure 7.4. The findings show that the two patterns are practically identical. Note also that Coleman and Dubuc (2010) used the automated program provided by the East West Center[2].

In summary, the fertility estimates achieved via the application of OCM to LFS data appear to closely resemble those of previously published estimates, supporting the use of this method for the analyses presented in this chapter.

[2]The software is available for download at the East-West Center website: `http://www.eastwestcenter.org`

7.3 Sample

The sample used for these analyses is restricted to females[3] of childbearing ages during the time periods of interest. As discussed earlier in Section 7.2, the OCM technique used to obtain indirect estimates of fertility uses current survey data to retrospectively estimate fertility. Thus, whilst females aged over 49 years at the time of survey are not currently of childbearing ages, they may still form part of the numerator and the denominator for previous years. For example, in the most extreme case, females aged 64 years in 2009 would represent females who were aged 49 years in 1994. Thus, it is important to make the distinction between the cross-sectional sample and the constructed sample used for the application of the OCM.

The numbers shown in Table 7.2 detail the number of females of each country of birth who are at childbearing ages *at the time of survey*, each featuring in the sample only once since it is a cross-sectional sample. In contrast to this, each of these females may represent *several* 'woman-years' because she will form part of the denominator (and potentially the numerator) for a number of years. For example, one Polish-born female aged 49 years in 2009 will also represent a Polish-born female aged 48 years in 2008, a Polish-born female aged 47 years in 2007 and so forth, so that this Polish-born female would in fact represent 15 'woman-years' from age 48 in 2008 back to age 34 years in 1994. After making this distinction between the two types of sample size, it is also clear how they are related to one another. Here, the sample sizes in Table 7.2 will now be discussed first as they indicate the numbers of females used to construct the 'woman-years' and also provide some general insight into the groups chosen for this analysis. The number of births and woman-years used to construct the fertility rates from these numbers will be returned to later.

Table 7.2 shows the unweighted numbers and weighted percentages of females at childbearing ages, defined here as 15-49 years, at the time of survey by their country of birth groupings. One of the first things to note here is that for the non UK-born groups, these are constituted of individuals by country of birth regardless of the time period in which they arrived to the UK. Thus, these groups include all foreign-born women from those countries of birth. This differs from the analyses

[3]Whilst it would be of interest to observe the fertility patterns of males in addition to those of females, it is considered more likely for children to be living with their mothers than their fathers overall (in those cases where they do not live with both parents). Thus, estimating fertility on the basis of children who are living with their fathers could lead to serious underestimation biases. Furthermore, it is generally considered more of a common phenomenon for male short-term economic migrants to move alone without their families, at least initially, which would further contribute to the problem of undetected children. For these reasons, the analyses focus solely on females here.

presented in Chapters 5 and 6, where the foreign-born groups have been further distinguished between as recent (arrival to the UK within the past five years) and established (arrival to the UK six years ago or before) migrants. The reasons for this difference are both substantive and practical. In substantive terms, it is considered important to assess the foreign-born group as a whole before investigating intra-group differentials according to duration of residence in the UK. This is the case because it is the foreign-born population living in the UK of childbearing ages that have contributed to recent increases in fertility, rather than only those who arrived to the UK from 2001 onwards. Thus, we consider here all migrants that fall within this category first by country of birth and then extend the analyses to consider the importance of duration of residence.

Table 7.2: Females of childbearing ages at the time of survey 2001-2009, by country of birth

Age group		**UK**	**Poland**	**Bangladesh & Pakistan**	**India**	**Other**	Total
15-19	Per cent[1]	93.90	0.23	0.43	0.21	5.20	100
	n[2]	*27,101*	*52*	*115*	*54*	*1,381*	*28,703*
20-24	Per cent	87.20	1.35	1.29	0.53	9.65	100
	n	*21,639*	*268*	*295*	*118*	*2,164*	*24,484*
25-29	Per cent	82.40	1.69	1.69	1.38	12.90	100
	n	*22,796*	*377*	*443*	*344*	*3,209*	*27,169*
30-34	Per cent	84.00	0.72	1.71	1.38	12.20	100
	n	*27,274*	*191*	*528*	*397*	*3,598*	*31,988*
35-39	Per cent	87.20	0.29	1.22	0.96	10.30	100
	n	*31,902*	*90*	*436*	*332*	*3,483*	*36,243*
40-44	Per cent	88.50	0.17	1.10	1.09	9.11	100
	n	*32,038*	*55*	*365*	*358*	*3,097*	*35,913*
45-49	Per cent	88.40	0.21	1.27	1.31	8.81	100
	n	*28,363*	*60*	*365*	*376*	*2,688*	*31,852*
Total	Per cent	87.40	0.63	1.25	1.00	9.77	100
	n	*191,113*	*1,093*	*2,547*	*1,979*	*19,620*	*216,352*

Source: Labour Force Survey 2001-2009, April-June quarters
[1] Weighted row percentages; [2] Unweighted sample sizes
Row percentages may not sum to exactly 100% due to rounding

In the case of the Polish and Other A8 groups, the large majority arrived fairly recently to the UK, indeed after 2004, following accession of these countries to the EU; but in the case of the country of birth groupings with more long-standing, established flows to the UK, such as Bangladesh, India and Pakistan, individuals may have arrived to the UK more than five years ago. By including those who

arrived earlier, but who were of childbearing ages at arrival, this allows consideration of the timing of migration and childbearing for earlier flows also. This relates to the practicality of also assessing all migrants, rather than just recent migrants, since the consideration of all migrants will allow for larger sample sizes. As is evident in Table 7.2, the sample sizes start to become quite small as the groupings are broken down by five year age categories and country of birth, despite the large overall sample size from the pooled data. It is for this reason that the following country of birth groupings have been selected: UK; Poland; Pakistan and Bangladesh (combined); India; and, Other countries. The Other A8 group studied separately in the previous two analysis chapters is now combined with the Other grouping due to small sample sizes[4], and for the same reason the decision was made to again combine Bangladesh and Pakistan, given the similarity of their fertility patterns within the UK. After these alterations were made, the sample sizes are considered large enough to use for OCM and these groups are considered the most important for analysis given their relative share of UK childbearing.

In terms of the actual sample sizes used in implementing the OCM, 303,242 females aged 15-64 years at the time of survey are analysed. Of these, 270,584 (88.4% weighted) are UK-born and 32,658 (11.6% weighted) are foreign-born. Across the 1994-2008 period for which fertility estimates are produced, there were 130,636 births and 2,380,844 woman-years retro-constructed.

7.4 Fertility estimates by country of birth

The first graph (Figure 7.5) shows age-specific fertility rates (ASFRs) for the 1994-2003 period, whilst the second graph (Figure 7.6) shows ASFRs for the more recent 2004-2008 period. It is considered important to distinguish between these two time periods, given the interest in comparing the experiences of the South Asian groups with more established flows to the UK against those of the Polish migrants, for whom the large scale of migration witnessed in the past decade is a more recent phenomenon.

These estimates are particularly interesting because they provide estimates for the Polish-born group for the first time. An important point to note is that there were not any births to Polish females aged 45-49 years in either of the time periods studied, despite unweighted sample sizes of 419 and 127 in 1994-2003 and 2004-2008, respectively. However, this is not unexpected for the older age groups, most likely reflecting this age group already having children, or that those who migrate

[4]Recall also from Chapter 6 that the probabilities of being parents were often found to be low for the Other A8 groups.

at these ages are selected in the sense that their migration is unlikely to be closely associated with childbearing.

For the 1994-2003 time period, Figure 7.5 shows that the overall fertility of Polish-born females is lower than that of all other groups. The weighted Total Fertility Rates (TFRs)[5] estimated for each of the groups are as follows, in ascending order: Poland 1.17, Other foreign-born 1.61, UK 1.65, India 1.68 and finally, Bangladesh and Pakistan 3.36. Whilst these TFRs give an overall indication of current fertility levels, a further analysis of the ASFRs reveals important differences according to age group. The fertility of the Bangladeshi and Pakistani born females is particularly high at all ages from ages 20 and above. Whilst Indian-born females fertility is overall higher than that of UK-born, this is largely due to high fertility of Indian born females between ages 25 and 34 years, with lower fertility than the UK-born below age 25 and similar patterns after age 34 years. Amongst the other foreign-born group, there is a tendency for slightly later childbearing than that found amongst the UK-born group.

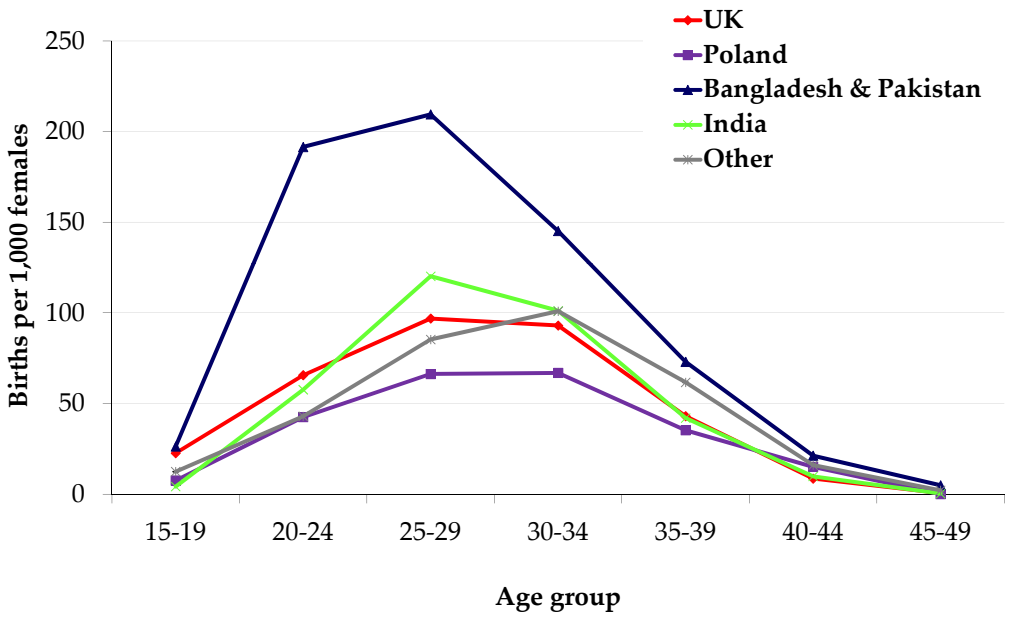


Figure 7.5: Own-Child Method (OCM) estimates of Age-Specific Fertility Rates (ASFRs) by country of birth, 1994-2003

The patterns here largely reflect current knowledge of fertility amongst these groups in the UK (which have previously been based on ethnicity), with the Indian females having lower fertility than Bangladeshi and Pakistani females, but

[5]Recall that the TFR is the sum of all ASFRs multiplied by five, due to the five-year age groupings used here.

all of these groups having overall higher fertility than the UK born females, but the difference between the UK and Indian groups being smaller (e.g. Coleman and Dubuc, 2010). Meanwhile, the Polish born females have relatively low fertility, which is characteristic of that found at origin. However, as discussed previously, this most likely does reflect a lot of the fertility experienced at origin as it is known that a large majority of this group arrived after 2004 and here their fertility is estimated for the period prior to this time. As discussed in Section 7.2, a benefit of the OCM approach is that it allows estimation of fertility before and after arrival. Therefore, it is now of interest to consider estimates for the more recent 2004-2008 period, as shown in Figure 7.6.

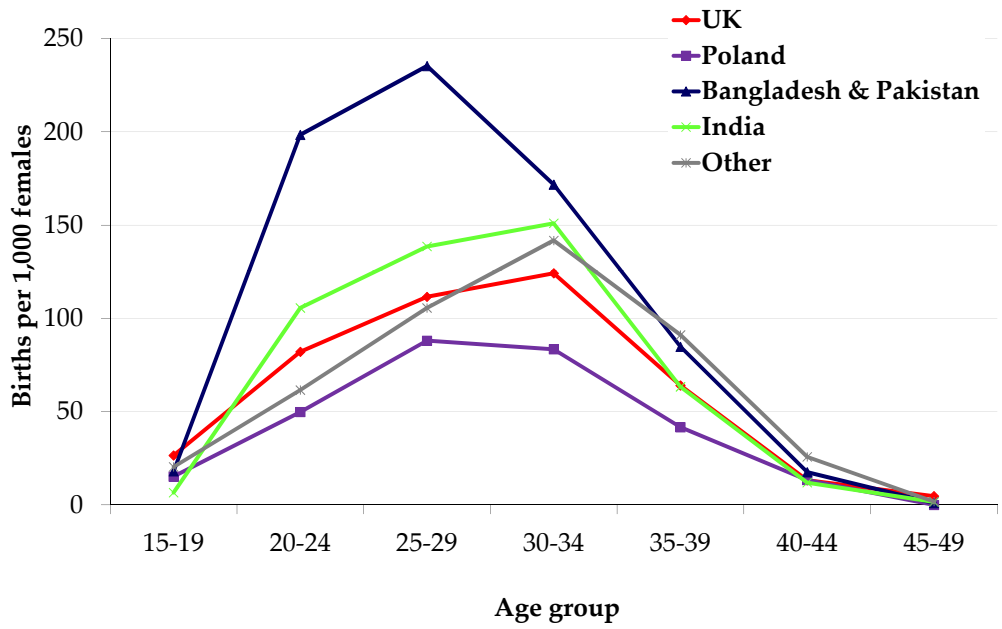


Figure 7.6: Own-Child Method (OCM) estimates of Age-Specific Fertility Rates (ASFRs) by country of birth, 2004-2008

The fertility of the Polish migrants is again lower than that of the other groups considered here, suggesting that if their share of childbearing does continue to increase in line with recent trends, their low fertility levels could actually act to lower the fertility levels of the foreign-born population. However, as suggested above, the numbers are not great enough at the moment for this to be the case. Whilst the Polish groups in the two periods seem to have a similar age profile, there have been some interesting intra-group changes for other groups across the periods. For the Indian migrants, there is a visible increase in age-specific fertility at ages 20-24 and 30-34 years, meaning that their fertility is substantially higher than that of the UK-born population in the later period. The age profiles of the UK-born and Other

groups can also be seen to have shifted with increases in fertility at older ages. Similarly to the Polish group, the age profile for the Bangladeshi and Pakistani group seems to have remained similar across time. The increasing fertility at older ages could be symptomatic of postponement and, to some extent, recuperation of fertility (Goldstein et al., 2009), since the females in the older categories in the recent period are also those in the younger categories in the earlier period. Furthermore, this paired with less evidence of postponement of fertility to older ages amongst the younger groups in the most recent period would seem to fit with currently observed UK patterns (Tromans et al., 2009) and perhaps explain some part of the clear increase in fertility of all groups in the second period.

The weighted ASFRs presented in Figure 7.6 follow the same relative patterns in terms of the ordering of the groups except that the UK-born TFR is now lower than that of the Other group, with the following TFRs in ascending order: Poland 1.46, UK 2.13, Other 2.24, India 2.39, and finally, Bangladesh and Pakistan 3.63. Thus, all of the TFRs are higher than those estimated for the earlier period above and also in comparison to what is suggested by published estimates for the 2004-2008 period. A likely cause of this may also be that this period is based on smaller sample sizes and therefore is subject to more variation than the previous period, meaning that caution should be maintained in interpreting the findings. This highlights the difficulty in obtaining estimates of fertility for these groups, despite the large overall sample size. However, the denominators are still based on reasonable sample sizes, with the smallest denominator being 127 for the Polish born females aged 45-49 years.

The differences could also reflect the fact that UK fertility has increased recently, although not necessarily of this magnitude. It is also worth remembering that the estimates are averaged across several years, with the earlier period averaged across years with more fluctuations in fertility, perhaps leading to a lower overall average than found for the later period, whereby fertility had been consistently increasing from 2004-2008. A further interesting idea is that the fertility in the later period might be indicative of elevated fertility following arrival to the UK, since for the Polish group at least it is thought that the earlier period is likely to reflect fertility in Poland and the later period fertility in the UK. Meanwhile, it is known that fertility amongst UK-born women has been rising (Tromans et al., 2009). However, these estimates do not properly distinguish between fertility in relation to the timing of migration. We will consider this next to try to disentangle childbearing occurring prior to and after arrival.

7.5 Fertility estimates by duration of residence

In this section, variables relating to year of arrival to the UK are used to disentangle the ordering of events for childbearing and migration amongst recent migrants. Firstly, we will consider the extent of childlessness amongst recent migrants to the UK. This will address hypotheses, such as the disruption and interrelation of events hypotheses (see Hypotheses 5 and 6 in Table 2.1), relating to the idea that fertility may be postponed in anticipation of migration or that migration may take place for family formation events, such as marriage and childbearing. Before continuing further, it is important to note that childlessness as discussed here is *observed childlessness* in the sense that we observe children living with their mothers in the UK via the LFS and are therefore unaware of whether any children have been left at home. This is of course different to *actual childlessness* since it is not possible to be sure that there are not undetected children who have remained in the country of origin. However, it is considered reasonable to assume that observed childlessness amongst the younger age groups may more often reflect actual childlessness than that amongst older age groups, if we are to assume that older children are more likely to be left than younger children.

In order to measure observed childlessness at arrival, it is necessary to further restrict the sample used. Firstly, the sample is restricted on the basis of age at arrival, focusing on ages 15-39 years at arrival to allow for subsequent childbearing to take place after arrival. Secondly, recent migrants are defined as individuals who arrived within the past five years prior to the survey date and so have only been resident in the UK for up to five years, with arrivals in the 1996-2009 period covered. The analyses of observed childlessness are also based on children aged 0-15 years living with their mother, since those aged 16 years and above are more likely to no longer be living with their parents. Thus, the measure of observed childlessness is informative with regard to the proportions of migrant females from different countries of birth that did not have any children 0-15 years living with them at arrival, and likewise, conversely those migrants that did move with their families. The findings from this analysis are presented in Figure 7.7 by age group at arrival for key country of birth groupings.

As might be expected, at ages 15-19 years at arrival, almost 100% of all migrant females are childless. The percentages childless at arrival generally decrease with age. This can be seen most dramatically for Bangladeshi and Pakistani born females with approximately two-thirds, half and just under 20% of those aged 25-29, 30-34 and 35-39 years, respectively, arriving to the UK without any children. Amongst the Indian-born females, of those aged 20-24 years at arrival almost 100%

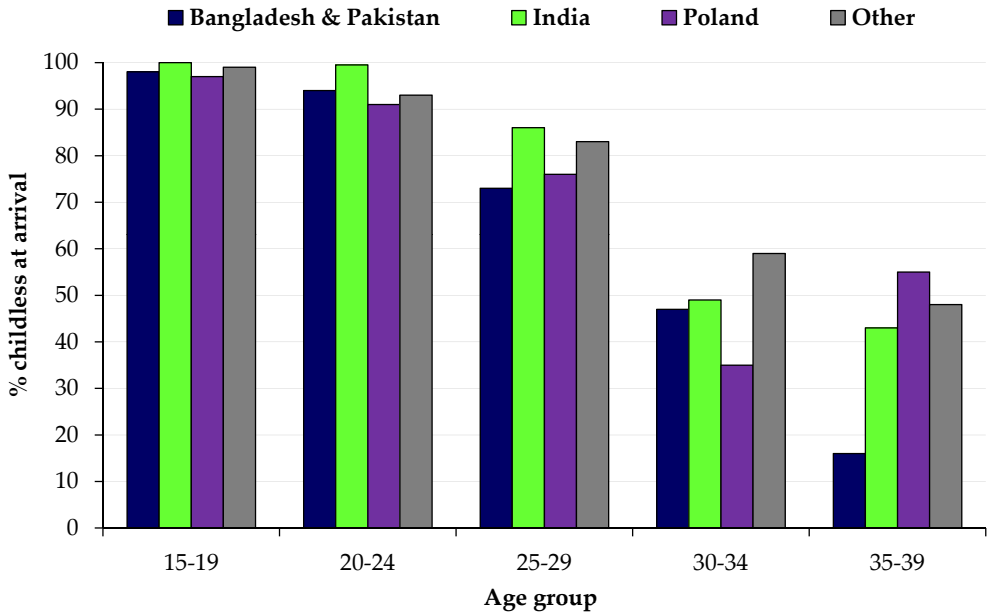


Figure 7.7: Percentages arriving without children, for females aged between 15-39 years at arrival who arrived up to five years prior to the survey date, between 1996-2009, by country of birth

are childless. The percentages childless are higher for Indian females than any other groups within the 15-19, 20-24 and 25-29 year age groups. This may reflect Indian females postponing childbearing until arrival even in their twenties or alternatively the postponement of childbearing and migration for other reasons, such as for the pursuit of education (Berrington, 2004). Of the Indian females arriving at ages 30-34 years and 35-39 years, the postponement of childbearing is less common with approximately 50% and 40% childless at arrival respectively.

As with the groups discussed thus far, the Other foreign-born group sees decreasing percentages of childlessness at arrival with increases in age, but less dramatically so than previously seen with almost 50% of the oldest group childless at arrival. It is difficult to discuss in detail the patterns found for the Other group since it is composed of all other countries of birth than those studied separately here, and as such is rather a heterogenous group. Finally, the Polish group presents an interesting case because their pattern differs slightly to that of the existing groups. Up until the last age group, the percentages childless at arrival does decrease with age, but at ages 35-39 years there is actually a higher percentage childless at arrival than found amongst those aged 30-34 years. In fact, the Polish females have quite similar percentages arriving childless to the Bangladeshi and Pakistani group at the 15-19, 20-24 and 25-29 years age groups, suggesting

that with increases in age, the Polish females have a greater tendency to already have children and to migrate with them to the UK than some of the other groups. Furthermore, at ages 30-34 years, this is particularly pronounced, with the Polish females having just under 40% childless at arrival, which is the lowest percentage amongst all groups at this age. By contrast, at ages 35-39 years at arrival, just over 50% of the Polish females are childless. This seems to suggest that it is particularly likely for Polish females to bring their children with them during their late twenties and early thirties but as they approach their late thirties it may be that any children they may have are older and therefore remain at origin or alternatively, that the migration of women of these ages from Poland is different in nature with only those who have not established families migrating, perhaps due to females with families at these ages having greater ties at origin (i.e. greater 'state dependence'; Willekens, 1987).

In order to investigate further whether those females who arrive childless remain childless or have children following migration, we next analyse births occurring in the UK to these women. This analysis allows us to address the question of how closely related the migration and childbearing events are. It is necessary to further restrict the sample used for this analysis, with only those females who were childless at arrival retained in the sample. In addition to this, we focus on those who have been resident in the UK for three years to see whether they have had one or more births within those three years. Thus, those who arrived between 1998 and 2006 are considered here, in order that they are observed at the surveys in 2001-2009. Finally, the 30-34 and 35-39 years age groups are omitted here to ensure reliability of the estimates, because the available sample sizes for the Polish females become quite small at these ages. The percentages of this group who had one or more births within their first three years of residence in the UK are shown in Figure 7.8, by country of birth grouping.

Figure 7.8 shows that for the Bangladeshi and Pakistani born females, migration and childbearing seem to be very closely related events. Even amongst the 15-19 years at arrival age group, over 40% of those who were childless at arrival have had at least one birth within three years. This increases slightly for those arriving aged 20-24 years and for those aged 25-29 years at arrival, approximately 60% have a birth within three years. For the Indian born females, an interesting pattern is observed, with the 15-19 years age group having the highest percentage, of the three Indian born age groups, that have a birth within three years of arrival, which like the Bangladeshi and Pakistani born females of this age is just over 40%. Meanwhile, just over 30% of the Indian born females arriving at ages 20-24 and 25-29 years experience a birth within three years of arrival. Thus, it appears that the migration experience of Indian females arriving at the youngest ages may be

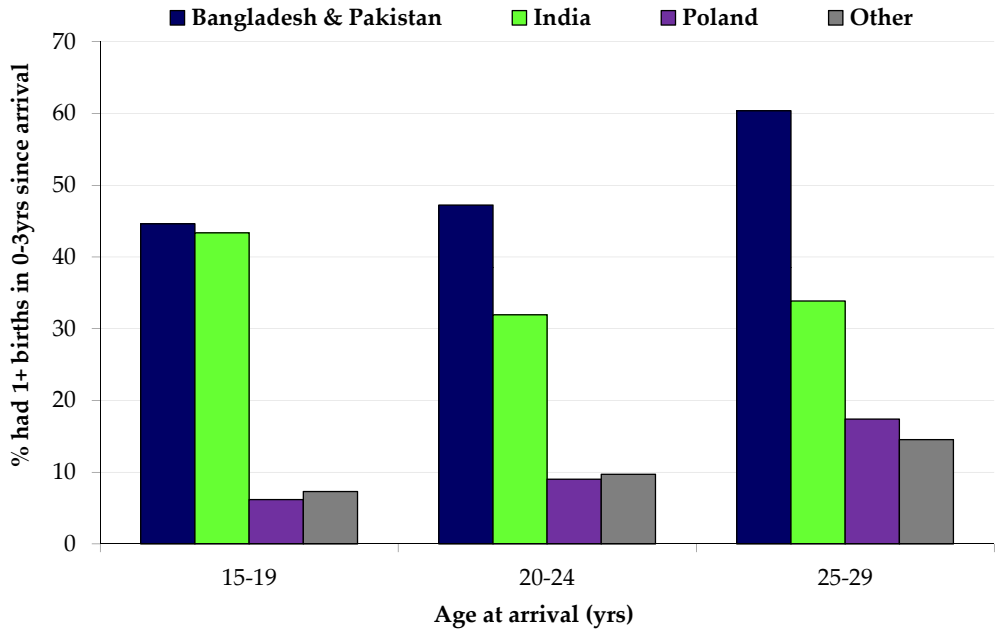


Figure 7.8: Of females who arrived to the UK, between 1998-2006, without children, percentages who had one or more births within three years of arrival, by country of birth

more closely related with family formation than for females who arrive in their twenties, which may be more associated with migration for other purposes, such as for education as suggested previously. Thus, for the Bangladeshi and Pakistani born females of all ages and Indian females at the youngest ages, there is strong evidence in support of the interrelation of events or disruption (prior to migration) hypotheses (see Table 2.1), with childbearing closely following migration. Given existing knowledge of the family-formation related migration to the UK of these groups (e.g Peach, 2006), it seems most likely that the interrelation of events hypothesis is applicable for these groups.

For the Other foreign-born and Polish born groups, the percentages that experience a birth within three years of arrival are much lower in comparison to the Bangladeshi and Pakistani and Indian born groups. Under 10% of those aged 15-19 and 20-24 years, and between 10% and 20% of those aged 25-29 years of both the Other and Polish born groups experienced a birth within their first three years of arrival. This would suggest that migration is much more closely associated with childbearing for the females born in South Asian countries than it is for those from Poland and Other countries. This would support the view that migration from South Asian countries may be more family oriented in nature than for individuals from the A8 countries from where migration is thought to be economically driven

and short-term in nature. This would also suggest that the increase in the Polish TFR seen in Figure 7.6 in comparison to Figure 7.5 is unlikely to be explained by the postponement and recuperation of fertility prior to and following migration, as was suggested above. Nonetheless, whilst the percentages are not as large as those found for other groups, the findings in Figure 7.8 do suggest that for a substantial minority of Polish females, migration and childbearing are closely tied but that this is not the case for the majority. Thus, for most Polish females, evidence is not found in support of the interrelation of events hypothesis, as it was for Pakistani, Bangladeshi and Indian females. Nor do the results support elevated fertility following migration, due to disruption effects for the Polish females. However, a longer time period may be needed to see whether a greater proportion of Polish females are having births in the UK, with longer durations of residence.

7.6 Discussion

The proportion of births occurring to foreign-born women has greatly increased in the past decade, with the number of women at childbearing ages increasing as a result of immigration - this has largely been due to new flows from the A8 countries. The estimates produced here provide a contribution to existing knowledge by estimating the fertility patterns of Polish born females for the first time and finding those fertility patterns to be characteristically low as found at origin in comparison to other foreign-born groups and UK-born women. Meanwhile, the fertility of the foreign-born groups from countries where the large-scale flows of immigration to the UK are more long-standing, such as the South Asian groups focused on here, is higher in comparison to UK-born fertility as might be expected from existing knowledge (e.g. Coleman and Dubuc, 2010) and trends in the country of origin.

Furthermore, the relationship between migration and fertility for these different migrant groups has been disentangled for the first time, using the year of arrival information available in the Labour Force Survey. The evidence in support of the disruption or interrelation of events hypotheses seems to be stronger for the females born in South Asian countries than for females born in Poland and Other countries outside of the UK. Thus, whilst there are increasing shares of live births within the UK occurring to foreign-born mothers, the fact that much of this increase is constituted by women with low fertility levels suggests that the influence of the Polish-born group may be to lower the foreign-born TFR, rather than to contribute to the high TFR of the foreign-born population. This might be the case should the numbers of Polish-born females at childbearing ages continue to increase in line with recent trends, but at present the numbers are not sufficient for

this to be the case.

The fertility of the Polish born females has provided an interesting case study because it presents a scenario with migrants arriving from a low fertility origin in contrast to the high fertility sending countries typically discussed within the migration and fertility literature. In comparing the evidence for this group and South Asian born females, it is interesting to find that the fertility displayed by both of these groups is characteristic to that at origin, which would suggest support for the socialisation hypothesis. However, such conclusions can not be drawn here because only a short time period and sub-sample are used, with longer term patterns in fertility needing to be considered. In the case of the Polish migrants this is not yet possible, given the recent nature of the large scale immigration flows. A further mediating factor in the Polish case will be for how long migrants remain in the UK, given that their movement within the EU is relatively easy and their migration often thought to be economically driven and short-term in nature. Nonetheless, it has been possible here to explore for the first term the emerging demographic trends amongst this group and to consider how they might contribute to the UK population structure, whilst dealing with the data limitations in conducting such analyses.

Chapter 8

Conclusion

In the past decade, there has been an increase in immigration to the UK, a substantial increase in the proportion of UK live births occurring to foreign-born women and rising UK fertility levels, which are partially attributable to foreign-born childbearing. Within the same time period, there have been important compositional changes in immigration flows to the UK, with large inflows of migrants from A8 countries, following their accession to the European Union in 2004 and Poland featuring amongst the most common countries of birth for foreign-born parents having live births in the UK. Despite the growing importance of foreign-born fertility in the UK context and these changing compositional patterns, there is little quantitative evidence on the family formation patterns of recent migrants to the UK and as such, there is currently little understanding of the family formation trends underlying the observed patterns.

The research conducted in this thesis examines the partnership and family patterns of recent migrants to the UK and provides new insights into this gap in the literature. It does so by addressing three main research questions, two of which are substantively focused and the third asking to what extent it is possible to answer the first two research questions with the data available in the UK context. The first of the substantive questions asks what the relationship is between migration timing and family formation events during the life-course, and thus, how the family patterns of recent migrants compare to those of individuals with different migration trajectories. The second of the substantive questions asks how the family formation and fertility patterns of recent migrants from different origins compare; focusing on the similarities and differences in the patterns of migrants from countries with more established flows, including Bangladesh, India and Pakistan, in comparison to migrants from the more recently established inflows, from Poland and Other A8 countries.

The theoretical background for the analyses was provided by the literature reviews of migration, fertility and migration-fertility interrelationships theory in Chapter 2. This Chapter introduced key migration theories for understanding the

nature of the 'migration system' existing between the UK and different countries of origin, major theories on the determinants of fertility outcomes and the short-term hypotheses of migrant-fertility patterns that are considered in this research. These are the 'disruption' and 'interrelation of events' hypotheses, which focus on the relationship between the migration event and the timing of subsequent fertility.

The review of data sources in Chapter 3 addresses the third research question, highlighting the limitations of many available UK data sources for this research due to small sample sizes. This is particularly problematic when analysing subgroups of the population, as is the interest here, as very large sample sizes are required to ensure reliable results. Unlike other European countries where recent studies on the relationships between migration and fertility have been conducted, the UK does not have a population register or social survey that provides both large sample sizes and detailed migration and fertility histories for conducting sophisticated longitudinal analyses, appropriate for life-course research. Therefore, the UK Labour Force Survey is used for the research with several years of data pooled together, due to the large sample sizes this offers for analysis and because it collects information on migration and family characteristics. This data source is cross-sectional but the key strength of the LFS is that it provides information on year of arrival to the UK, and by using this information with the Own Child Method it is possible to create retropsective migration and birth histories, to some extent. Furthermore, the year of arrival information is invaluable for comparing the arrival patterns of both partners within a couple. This information is based on individuals within the same household at survey so does not capture partners or children who remain in the country of origin but provides insight into family patterns whilst living in the UK, enabling understanding of the contribution this will make to the composition of the UK population, which is one of the main interests within this research.

Analyses were conducted to address the substantive research questions for partnership status in Chapter 5 and for parent status in Chapter 6, with estimation of fertility patterns in Chapter 7. These research questions focused first on comparing the partnership and family patterns of recent migrants with those of individuals with different migration histories, to examine the relationship between family formation and migration in the life-course; and secondly, on comparing partnership and family patterns of recent migrants from the Indian subcontinent with those of recent migrants from A8 countries, considering the importance of migration system and country of origin for the patterns observed amongst these different groups.

Two key findings emerged in the analyses of partnership status, in addressing

the first research question in relation to life-course stage occupied at migration. Firstly, amongst individuals aged 20-24 years, recent migrants always have higher probabilities of being partnered than established migrants and UK-born individuals. This means that migrating at younger ages is associated with earlier transitions to living with a partner than found amongst other groups. This is interesting given the increasing ages at leaving the parental home and increasing prevalence of non-family living for young UK-born adults (e.g. Stone et al., 2011), suggesting that the experience of young recent migrants at these ages is quite different. This is likely to be due to the selective nature of the recent migrant group, given that they have made a migration and therefore are likely to have by necessity left the parental home. Furthermore, it might be that young unpartnered migrants are more likely to live in the types of settings that are not as well represented in the dataset, because the LFS is a household survey.

Secondly, when observing the older age groups, the importance of gender for partnership status patterns emerged. For female recent migrants, the probabilities of being partnered are always found to be high in comparison to other females, whilst for males this is not always the case. For the male recent migrants, higher partnership probabilities were found for more highly educated and older males. Thus, this pattern reveals that is far less common for females who have recently migrated to be unpartnered than is the case for males, with gender more important than country of origin for partnership patterns. These findings are supported by the analyses conducted to compare the differences between recent migrant groups, with high partnership probabilities found for Bangladeshi/Pakistani, Indian and Polish females across different groups, whereas a more complex pattern was found for male recent migrants, for whom partnership probabilities were not always high. This finding is important because 1) it contradicts the popular belief of Polish and Other A8 migrants as being primarily single because their migration is economically motivated and 2) highlights that gender is very important here because this pattern is found for females across the countries of birth of interest, despite the different migration systems between origin countries and the UK, for females from the Indian subcontinent and A8 countries.

Whilst the analyses of partnership probabilities reveal the similarities amongst female recent migrants, the analyses of partner characteristics reveal important differences. Once having controlled for being partnered, the country of origin is more important for determining partner type with greater similarities across sexes but within country of birth groupings. Relatively high proportions of Bangladeshi/Pakistani and Indian migrants are found to partner with UK-born individuals, providing ongoing evidence for marriage related migration amongst these groups (e.g. Charsley et al., 2012), and in those cases where they are partnered with other

migrants, their partners often arrived before them, although the picture is more mixed for the Indian group. By contrast, the vast majority of Polish and Other A8 migrants are partnered with migrants who arrived to the UK at the same time, or where males arrived before females. Thus, whilst high proportions of all females are partnered, the importance of migration system for shaping the way in which this occurs is evident. In the case of migration from the Indian subcontinent, relatively long-standing migration flows to the UK means that there are now second generation individuals who are of marriageable ages who provide potential partners from the same cultural and ethnic backgrounds for first generation recent migrants. By contrast, the Polish and Other A8 migration to the UK is a relatively recent phenomenon, at its recent scale, meaning that to partner with individuals from the same background is to partner with other migrants. Further to this, the socio-legal context means that it might be more difficult for partners from the Indian subcontinent to migrate together, whilst the freedom of movement within the European Union means that this is a more viable option for A8 migrants.

The analyses of parent status amongst groups with different migration trajectories reveal that, after controlling for being partnered, recent migrants typically have lower probabilities of living with dependent children than other groups, except amongst the most highly educated Asian males and females and European males. Therefore, whilst recent migrants often make the transition to living with a partner more quickly than other groups, the same is not true for becoming a parent. Further analyses could explore whether this is associated with a choice not to have children due to the pursuit of other opportunities or that couples would like to have children but do not feel able to for some other reason.

The analyses of parent status between recent migrant groups also show differences in the probabilities of being a parent between females, with high probabilities for Pakistani/Bangladeshi and partly for Indian females, whilst the probabilities are low for Polish and Other A8 females. For male recent migrants, the probabilities are found to be high amongst the Pakistani/Bangladeshi group only at younger ages, and to be more comparable amongst groups at older ages. This suggests that whilst partnership propensities are similar amongst recent migrant females, the same is not true for parenthood with cultural norms and patterns at origin appearing more influential (i.e. lower fertility amongst the A8 groups in comparison to Pakistani/Bangladeshi and Indian groups). It might also be that type of migration is more important here, since A8 migration is considered to be primarily economically motivated and higher proportions of females from these groups were found to be employed, with partnership presumably not acting as a barrier to employment in the way that childbearing might.

The Own Child Method estimates of fertility by country of birth support the findings for parent status discussed above. These estimates provide the first quantitative estimates of the fertility patterns of Polish females living in the UK, offering important insights into the patterns underlying the high ranking of Polish females in the countries of birth of foreign-born mothers having live births in the UK. The fertility of Polish females is shown to be lower than that of the UK-born group, and consistent with Polish fertility at origin. The implications of this are that 1) the high number of live births in the UK to Polish females is likely to be attributable to the size of the Polish population, rather than to an increase in fertility of Polish women in the UK, and 2) that if the share of childbearing occurring to Polish-born females continues to increase, their fertility could actually act to lower the high foreign-born average. Indeed, estimates published by the Office for National Statistics since conducting this research show that in 2010 Poland became the most common country of birth for foreign-born mothers having live births in the UK, and the second most common country of birth for foreign-born fathers, whilst the share of all live births occurring to foreign-born mothers continued to increase.

The findings from analyses of fertility estimates by duration of residence in the UK provide support for the interrelation of events or disruption hypotheses operating for female recent migrants from Pakistan/Bangladesh and for the youngest females from India, with childbearing occurring soon after migration, whilst this is found to be the case for only a very small minority of Polish females. Greater proportions of Polish females are found to bring children to the UK with them, in comparison to the other groups, however. Whilst these results are not surprising, this is one of the first studies to provide empirical evidence to suggest that family formation is not so closely associated with migration for 'labour migrants' as it is for other types of migrants.

An important point to note here is that a study purely of the short-term hypotheses of fertility for the groups of interest in this research would simplify the overall picture. Whilst it is true that migration does not appear to be so directly related to family *formation* for the Polish groups as it is for the South Asian groups, the analyses within this thesis show that migration is still indirectly related with being in a family for many of the Polish groups studied here, and particularly so for females. Firstly, high proportions of the females are living with partners and secondly, sizeable proportions are bringing their children to the UK with them. The analyses of partner characteristics and arrival reveal that for this group, family reunification appears to be operating with females soon joining males. This is consistent with findings from qualitative research (White, 2011) and provides some of the first quantitative evidence on the topic.

The patterns seen for the Polish group fit well with those suggested by the migration theory with migration initially starting for economic reasons and then social networks being established and reunification occurring. However, in the Polish case this process can be seen to almost be accelerated, with this chain of events occurring within a relatively short period of time, which is likely due to the lack of legal constraints on the movement of these individuals. Thus, for South Asian and A8 migrants, it can be seen that migration is associated with being in a family for many but that this manifests in different ways due to the different migration systems and socio-legal contexts that exist for these groups.

8.1 Further research

In this section, ideas for expansion of the current research are briefly discussed.

An interesting finding throughout the research was that education does not always act in the way expected in relation to family formation behaviours. Whilst higher levels of education would be expected to be associated with lower partnership and parenthood probabilities, this was not always the case and in some cases, the education variable was not found to be statistically significant at all. It would seem that because these individuals are a *selected* group, education may not act in the same way for this group as it does amongst more heterogeneous populations. However, it would be interesting to explore this further as it might also suggest that despite individuals from countries that are experiencing their fertility transitions (e.g. Bangladesh and Pakistan) attaining higher levels of education, they are still engaging in marriage-migration related practices and thus cultural and religious norms might be more important for shaping behaviours than educational attainment. This finding could also be due to the use of the years of education measure used here to capture educational differences, and so it would be useful to see if different measures of foreign-born education could be found in other social surveys, and whether the results found here are replicated using those alternative measures. For example, research could examine how well the years of education variable reflects educational differences in the countries of origin.

The analyses of partner characteristics provided interesting results and there is much more scope to expand this work further within the migration-fertility framework, particularly if viewing longer-term trends in fertility outcomes. This area is relatively neglected within the literature at present. In the UK context, the case of Bangladeshi and Pakistani migrants would be particularly interesting to consider because research has not yet considered whether there are important differences

between the fertility behaviours of second-generation individuals partnered with other second-generation individuals, in comparison to second-generation individuals partnering with first generation individuals, for example. It would be possible to look at this issue for the Pakistani and Bangladeshi groups with the LFS data used here and to also consider the importance of other types of partner characteristics, such as partner's age and education. It would also be of interest for partner characteristics to be integrated into the literature more generally and analysed in studies across different contexts.

Another area for further research would be to consider age at migration (which was only briefly considered in this research when estimating fertility by duration of residence in Chapter 7), since this is indicative of whether individuals were exposed to different norms during childhood or at childbearing ages only. The established migrant group analysed in Chapters 5 and 6 consisted of individuals who migrated to the UK more than five years ago but at any age. Thus, it might be more informative to separate this group into those who arrived to the UK during childhood and those who arrived when at childbearing ages. This could be achieved with the LFS data by using age at survey and year of arrival information to calculate age at arrival to the UK, as calculated for females in Chapter 7.

The analyses of Polish fertility in the UK could be expanded further. At the time of conducting this research, this is still a new emerging phenomenon and much of the fertility captured in the own child estimates reflects fertility at origin. It will be interesting for future research to analyse this further to see whether Polish fertility in the UK does appear to be different to that at origin, as more data becomes available and with longer durations of residence in the UK. Furthermore, the analyses of fertility by duration of residence considered births after arrival to only females who were childless at arrival, but it would be interesting to also investigate higher order births and whether females who migrate with children go on to have more births after arrival to the UK. However, this would require larger sample sizes than those available in the LFS sample used for this research, and more recent data would be needed to consider the importance of longer durations of residence for fertility following arrival.

Finally, there is scope for further research on these issues as more data becomes available. The 2011 census has now been collected and will provide the opportunity for representative, updated, cross-sectional analyses of fertility patterns amongst different migrant groups, with a new question asking year of arrival to the UK, for the first time in 2011. There is also potential with the new 'Understanding Society' UK Household Longitudinal Study (UKHLS)[1], which is

[1]Note that from Wave 2 onwards, this survey will also integrate the sample from the existing

a longitudinal household survey with a larger sample size than any other comparable UK survey. The first wave of data is available to researchers in November 2011, and so the longitudinal element will be limited, but once more waves of data become available, this will provide an opportunity for longitudinal analyses for some sub-groups, and initial analyses could explore the the detailed retropsective migration and family histories collected by the survey.

British Household Panel Survey (BHPS), which was reviewed in Chapter 3.

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