THE ENGLISH LANGUAGE FLUENCY AND OCCUPATIONAL SUCCESS OF ETHNIC MINORITY IMMIGRANT MEN LIVING IN ENGLISH METROPOLITAN AREAS

By

Michael A. Shields* and Stephen Wheatley Price**

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This paper examines a crucial aspect of the assimilation experience of ethnic minority immigrants in the United Kingdom. It explores the determinants of their English language (speaking) fluency and the key role such skills play in their occupational success. Our sample is derived from the Fourth National Survey of Ethnic Minorities undertaken in 1994. Uniquely this data contains an interviewer-assessed measure of English language fluency. Importantly, we also attempt to control for possible endogeneity bias in the estimates of the effect of language fluency on occupational success. We find that fluency increases the mean hourly occupational wage by about 20%.

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* Department of Economics and Public Sector Economics Research Centre (PSERC), University of Leicester.

** Corresponding author. Department of Economics and Public Sector Economics Research Centre (PSERC), University of Leicester, University Road, Leicester, LE1 7RH, United Kingdom, Tel: +44 (0)116 2525645, Fax: +44 (0)116 2522908, E-mail: swp2@le.ac.uk

1. Introduction

The United Kingdom was a major source of international migration flows over the last two centuries. Only relatively recently has it become a country of net immigration, driven primarily by inflows from non-English speaking countries (see Hatton and Wheatley Price, 1998 for an extended discussion). According to the 1991 Census the total stock of immigrants numbered nearly 4 million people (or 7.4% of the United Kingdom population) whilst approaching 3 million people (or 5.5% of the total) belonged to the ethnic minorities, the majority of whom were born abroad. Both ethnic minority and immigrant groups are highly concentrated in the metropolitan areas of England. In particular, 45% of Britains' ethnic minorities reside in Greater London, together with 37% of all immigrants (Owen 1992, 1993), and the majority of the remainder live in an urban environment.

The labour market disadvantages of Britain's ethnic minorities are well recognised (e.g. Modood et al., 1997) and a number of recent papers have investigated the extent of racial discrimination in their employment, earnings and promotion performance (e.g. Blackaby et al. 1994, 1997, 1998, Pudney and Shields, 2000). Recently the immigrant status of the majority of these individuals has been shown to be important in determining their employment and unemployment propensities (Wheatley Price 2000a, 2000b), earnings (Shields and Wheatley Price 1998) and employer-funded training outcomes (Shields and Wheatley Price, 1999a, 1999b) using 1990s data. However, the role of English language skills in the labour market outcomes experienced by the vast majority of Britain's ethnic minorities has yet to be examined using recent data.[1]

In this paper we focus on male ethnic minority immigrants living in English metropolitan areas since this is where the vast majority are concentrated, and where their disadvantage is greatest. For example, ethnic minority men in Greater London are twice as likely to be unemployed than white men (Modood et al., 1997). Nevertheless, this study concerns those in the best labour market position, namely paid employees. If we can learn something about the causes of their success, especially what role fluency in the English language plays in helping them climb the

occupational ladder, then we may be able to suggest ways out of the difficulties faced by others and policies to help this process.

We explore two aspects of their assimilation experience, namely their English language (speaking) fluency and occupational success, using data from the Fourth National Survey of Ethnic Minorities, undertaken in 1994, by the Policy Studies Institute (Modood et al., 1997). Uniquely this data provides interviewer-assessed measures of English language speaking fluency, thus avoiding the measurement error endemic in studies that use self-reported measures (Dustmann and van Soest, 1998a, 1998b). In this paper occupational success is determined by the mean gross hourly wage associated with each 3-digit Standard Occupational Classification type of employment, using information on average earnings from the 1993-95 Quarterly Labour Force Surveys of the United Kingdom.[2] Due to the continuous nature of this variable we can use similar econometric techniques to those employed in studies of immigrant earnings.

We estimate determinants of language fluency models, following Chiswick and Miller (1995), and then attempt to capture its affect on occupational success, along with other immigrant-related characteristics. As has been demonstrated by Chiswick and Miller (1992, 1995), Chiswick (1998) and Dustmann and van Soest (1998a, 1998b) Ordinary Least Squares (OLS) estimates, of the coefficient on language fluency, may be biased due to the presence of unobserved heterogeneity affecting both language fluency and measures of earnings. In an attempt to allow for this possibility we use the technique of Instrumental Variables (IV). Our results using OLS appear to underestimate the importance of English language fluency on the occupational success of ethnic minority male immigrants living in English conurbations.

The paper is set out as follows. Section 2 reviews the theoretical hypotheses concerning language acquisition, proposed by Chiswick and Miller (1992, 1995), and labour market success, suggested by Chiswick (1978). We introduce our data source and describe the specific sample in section 3. Section 4 discusses the determinants of English language fluency whilst section 5

presents our results concerning occupational success. Section 6 concludes and discusses some policy implications.

2. Theoretical Considerations

Cross-sectional studies of the earnings of immigrants in the United States' labour market have revealed much about their economic assimilation, following the seminal paper by Chiswick (1978). Since labour market experience gained in the destination country is valued more highly than that gained in the source country, due to the necessity of acquiring location-specific human capital, immigrant earnings growth is so rapid that the wages of comparable natives are exceeded after approximately 10 – 15 years (Chiswick, 1978).

One of the most important forms of location-specific human capital is the ability to communicate in the host country's language. These skills are embodied in the person, productive in the labour market and/or in consumption, and are costly to acquire, both in terms of time and other resources (Chiswick and Miller, 1992, 1995). For immigrants the acquisition of this form of human capital has been shown to be crucial to their labour market success in a number of different countries (see Chiswick and Miller, 1995 and Chiswick, 1998 for summaries of this literature).

Chiswick and Miller (1992, 1995) argued that language fluency was determined by economic incentives, exposure to the language and the efficiency of acquisition. We now briefly summarise their main hypotheses. Economic incentives include the expected economic benefit from fluency (giving rise to possible endogeneity between measures of economic success, such as earnings, and language fluency) and the expected future duration in the destination (see Dustmann, 1999 for evidence).

Exposure may occur before immigration through formal education or the use of the language in everyday life (e.g. English is an official language in many of countries of origin for United Kingdom immigrants). Post-immigration exposure may occur with time spent in the destination country, through education, through marriage to a native born person or through specific

language training. Exposure may be lessened if the immigrant lives and works mainly amongst their own ethnic group, is married to an immigrant who shares the same first language or if they have children who act as translators for them. The efficiency of acquisition of language skills depends on age, particularly the age at which acquisition begins (often upon immigration), the individuals learning ability (which is related to their level of education) and the linguistic distance between the immigrant's mother tongue and English.

Empirically this model predicts that fluency in the destination country's language would be positively related to the expected wage increase arising from fluency, the expected future duration in the country, the number of years since migration, formal language training, and the individual's level of education. However, being married to a fellow immigrant, having children who act as translators, living amongst other members of the same ethnic group, increasing age of immigration and linguistic distance would be expected to be associated with reduced language proficiency (Chiswick and Miller, 1995).

In the absence of direct information concerning expected future duration in the destination country we suggest that immigrants who send remittances to family or friends in their home country have fewer incentives to invest in location-specific language capital. Galor and Stark (1990) have argued that if the worker is a remitter they would be more likely to return migrate than if they were not sending remittances to their country of origin. Merkle and Zimmermann (1992) provide supporting empirical evidence for this hypothesis amongst German immigrants. As Dustmann (1999) has argued an immigrant who is likely to return migrate has fewer incentives to invest in linguistic skills appropriate only to the country of temporary residence. Therefore, we hypothesise that workers who are sending remittances would be less likely to be fluent in the English language than those who are not. Furthermore, we suggest that if an individual has a long-term health problem they are less likely to invest in language fluency due to both reduced economic incentives and lower efficiency in attaining fluency.

In addition to the standard human capital, familial and locational characteristics, which are widely perceived as being associated with higher wages and occupational success, aspects of being foreign born have been shown to be important in such models. Specifically, as mentioned earlier, Chiswick (1978) has shown the separate effect of time spent in the destination country, usually measured as years since migration, on the earnings of immigrants. Furthermore, numerous differences amongst immigrants are often captured by country of origin variables. These include differences in the quality and transferability of the education and experience they received abroad. In addition there may be systematic differences in unobserved factors associated with country of birth such as the political or economic climate at the time of emigration, the nature of the migration flows (e.g. refugees) and the likelihood of return migration (Chiswick, 1978; Borjas, 1985, 1987). We examine these hypotheses in section 5.

We now introduce our data source and describe our particular sample before turning to an empirical investigation of these hypotheses.

3. Data

3.1 Data Source

The data source we use in this paper is the Fourth National Survey of Ethnic Minorities, conducted by the Policy Studies Institute in 1994 (see Modood et al. 1997 for fuller details). The samples of ethnic minorities included in the survey were selected using data from the 1991 Census to divide all electoral wards in England and Wales into three bands (high, medium and low), according to the proportion of the population who reported being members of an ethnic minority. Random samples of wards were selected and, within each ward, addresses were randomly sampled. High band ethnic minority wards were over-sampled. Interviewers then visited the resulting 130,000 addresses to identify whether any members of the target ethnic minority groups (Black Caribbeans, Indians, Pakistanis, Bangladeshis, African Asians and Chinese) were living at each address. For historical

reasons Black Africans are not included in the survey and therefore the sample is not nationally representative of all ethnic minority groups.

At each household containing adults (aged 16 or over) from these target groups, up to two were randomly selected for interview. Where there were two respondents in one household each was asked one of two randomly assigned questionnaires, including the same core questions (which we use in this study), with different sets of secondary questions. Both individuals who were born in the UK and those who were born abroad were included in the sampling. Interviews were successfully undertaken in 3291 ethnic minority households, involving 5196 adults. The response rates were 61% for Black Caribbeans, 74% for Indians and African Asians, 73% for Pakistanis, 83% for Bangladeshis, 66% for Chinese and 71% for the comparison sample of 2867 Whites. Importantly, a member of the same ethnic group as the respondent, and who spoke both English and the respondents other main language, conducted the interview in order to maximise response rates and minimise misunderstandings. Uniquely, amongst national level sources of data in the United Kingdom interviews could be conducted wholly or partly in the interviewees' language of preference, as well as in English. This data therefore captures the substantial proportion of the ethnic minority population with poor language skills who are missed by other surveys that only interview in English.

Furthermore, the interviewer's assessment of the respondent's English language speaking fluency is recorded in the data, together with whether the interview was conducted wholly, partly or not at all in English. Most other studies of this nature base their findings on self-reported measures of language fluency, which have been shown to systematically misclassify language ability. This results in under-estimates of the true importance of fluency on earnings (Dustmann and van Soest, 1998a, 1998b). Our data is therefore free of self-reported measurement error, although the interviewers themselves may have incorrectly assessed the language ability of respondents. Unfortunately, our data only contains information on speaking fluency. Chiswick (1991) and

Dustmann (1994) provide evidence to suggest that reading fluency and writing fluency, respectively, are even more important determinants of earnings than speaking fluency.[3]

The data records the earnings of employees, but only grouped in bands, and around 20% of responses are missing. However, by using the record of the individuals 3-digit Standard Occupational Classification (899 categories) we can compute the mean gross hourly wage for each occupational category using data from the Quarterly Labour Force Survey of the United Kingdom (1993-5). This information is derived from the 83777 full-time, white and ethnic minority, native born and foreign born, employees, aged 22-64, who reported wage information in one of these surveys. This is the measure we use to rank occupational success in our analysis (following Nickell, 1982 and Stewart, 1983). Since the Fourth National Survey of Ethnic Minorities provides no direct information on years of schooling, or no simple way to accurately derive one, we use highest qualification as our measure of education.[4] For similar reasons, we use age, rather than years of potential experience, in our models. In addition, the data includes information, derived from the 1991 Census, on respondents' own ethnic group density at ward level (about 60,000 individuals).

3.2 Sample Descriptive Statistics

Selecting ethnic minority, foreign born male employees, aged between 22 and 64, who were living in the metropolitan areas of England in 1994, provides us with a sample of 565 individuals. The mean values of the dependent and independent variables used in our analyses of the determinants of language fluency and occupational success are presented in Table 1, together with their standard errors. Over half the sample (58.2%) have been assessed by their respective interviewees as being fluent in (speaking) the English language whilst the average gross hourly mean occupational wage is £6.14.

The mean age of our sample is 40 years old and on average they have been in the UK for 21.5 years. This implies a mean arrival year of 1972 or 1973 aged 18-19 years old. Over 30% of our sample are Indian (born in India) with a further 20.5% being Pakistani (born in Pakistan) and 10.3%

are Bangladeshi (born in Bangladesh). Of the 21.2% who were born in East Africa, but who have their historical roots in the Indian Sub-continent (referred to as African Asians), the vast majority are of Indian ethnicity but there are a few whose families originate from Pakistan or Bangladesh (Modood et al., 1997). A small number (4%) of ethnic Chinese immigrants are also in our sample.

Nearly 86% of the ethnic minority foreign born men in our sample are married, most to fellow immigrants reflecting their cultural practices. Similarly, large families are not uncommon amongst these groups with 10% of men reporting to have four or more children and 14% having three dependent children. Over 25% of respondents have a child over the age of 15 still living in the household, with less that 15% having no children at home.

The highest qualification variables record the prevalence of individuals at both ends of the educational achievement spectrum. More than 22% of these immigrants possess degree-level qualifications and yet over 35% have no qualifications whatsoever. Over 20% have vocational qualifications, 7.5% possess formal schooling certificates at A-level and 14.6% at O-level corresponding to the UK school-leaving ages of 18 and 16 years old, respectively.

As mentioned in the introduction to this paper, our sample reflects the locational dominance of Greater London (53.5%) amongst these groups. The (West) Midlands metropolitan area accounts for 28.1% of our sample with the remainder being distributed amongst the northern metropolitan areas of Merseyside, Greater Manchester, South and West Yorkshire and Tyneside. The concentration of specific ethnic groups in Census wards is highlighted by the fact that less than a quarter (22.8%) of our sample reside in a ward with a density of their own ethnic group under 5%. Over 40% live in a ward where their ethnic group accounts for at least 15% of the population.

The substantial minority (37.5%) of ethnic minority immigrant male employees work in the manufacturing sector with the non-financial service sector (including retail, sales, personal, hotel and catering services) accounting for a further 22.3%. The remainder of the sample is fairly evenly distributed (about 10% each) amongst the financial, public, transport and other sectors of industry. Just under half (45.7%) of the workers are employed in large firms (> 50 employees at the

workplace). Less than 4% of our sample reported a long-term health problem that limited the type of paid work that they could do, whilst nearly 30% remitted some money to family or friends in their country of origin. Lastly, nearly 60% of respondents were interviewed, for the survey, wholly in English, a further 26.4% partly in English and just 14% wholly in another language.

4. The determinants of English language fluency

4.1 Preliminary Analysis

Each respondent to the Fourth National Survey of Ethnic Minorities had their English language speaking fluency assessed by the interviewer, a member of the same ethnic group and fluent in the respondent's other main language. The categories of assessment were fluent, fair, poor or none. In this paper, as with previous studies, we investigate the determinants of language fluency. Therefore, we constructed a dichotomous variable taking the value one if the individual was recorded as fluent in speaking the English language and zero otherwise. Table 2 presents some descriptive statistics concerning the fluency of our sample according to a number of characteristics that are thought to be potentially important determining factors. It also shows whether the proportion of our sample who are fluent, when each characteristic holds, is significantly different (using simple T-tests) from the proportion who are fluent, when the characteristic does not hold (i.e. when the respective dummy variables take the value 1 and 0). It is important to bear in mind that these are only bivariate comparisons and take no account of other relevant factors.

The actual proportion of ethnic minority immigrant men in our sample who were assessed as fluent in speaking the English language was 0.582. Compared to their respective comparison groups those who immigrated aged less than 10 years old (0.785 fluent) and those who have been in the UK for at least 20 years are significantly more likely to be fluent. Immigrants who arrived aged at least 25 years old (0.473) and those who have spent less than 15 years in the UK (0.370) have very low fluency rates.

Black Caribbeans have the greatest proportion of interviewer-assessed fluent speakers of the English language (0.870), followed by African Asians (0.675) and the Chinese (0.652). Interestingly, Indians are much less likely to be fluent (0.567) than African Asians, the vast majority of whom are of Indian ethnicity. Another reason for not grouping together immigrants of South Asian ethnicity in studies of labour market performance is the significantly poorer fluency rates amongst Bangladeshis (0.431) and Pakistanis (0.379).

Marriage to a woman born in the United Kingdom increases English language fluency by 1% point over marriage to a female immigrant, but, interestingly, single ethnic minority immigrant men are significantly more likely to be fluent (0.688) than married men. Having one or two dependent children (0.677, 0.635) significantly increases fluency rates, whilst having three or four or more children (0.450, 0.322) significantly reduces the likelihood of fluency, compared to their respective opposites. Having no children at all in the household significantly increases the fluency rate of immigrant men (to 0.743).

Not surprisingly, fluency in speaking the English language is positively related to the level of educational attainment. Ethnic minority immigrant men with a degree (0.833) or vocational (0.789) are significantly more likely to be fluent than their respective opposites. Those with no qualifications (0.323) are substantially less likely to be fluent than those with some qualifications.

Location appears to make an important difference to language fluency. Immigrants residing in Greater London (0.695) are significantly more likely to be fluent than those living in the Midlands (0.447) or the North (0.462). Furthermore, increasingly the local density of the same ethnic group generally reduces fluency with those living in a Census ward with 0–5% own ethnic density (0.682) being significantly more likely to be fluent than those in other categories. Individuals with a long-term health problem (0.409) are significantly less likely to be fluent than those without. However, being a remitter makes no statistically important difference to fluency in this simple bivariate analysis.

The final evidence from Table 2 relates fluency rates to the linguistic nature of the interview. Evidently being assessed as fluent in speaking the English language is significantly and positively correlated to the likelihood of being interviewed wholly in English, whilst the opposite is true for those interviewed only partly in English or wholly in another language. Since the question on the linguistic nature of the interview comes just before that on interviewer-assessed language fluency in the questionnaire it is surprising that only 88.1% of those interviewed wholly in English are recorded as being fluent. Even more intriguing is the finding that 21.5% of those interviewed partly in English and partly in another language, and 2.5% of those interviewed wholly in another language, were actually capable of being interviewed wholly in English since they were assessed as fluent. Evidently other factors than merely English language speaking fluency determined the joint linguistic decision by interviewer and interviewee.

4.2 Multivariate analysis

Following Chiswick and Miller (1995) we estimate the determinants of English language (speaking) fluency with independent variables attempting to investigate most of the hypotheses outlined in Section 2. This multivariate approach allows us to estimate the separate effect, of each of the explanatory variables, on language fluency. The first model we estimate (model A) includes variables capturing the age of immigration (and square), years since immigration,[5] country of birth, level of highest qualification and region of residence. Unfortunately, in common with most other studies of this nature, we do not observe the expected wage premium from fluency or whether the individual has received any formal language training. Neither do we have a direct measure of the expected future duration in the country or linguistic distance. Country of birth variables may capture these latter two effects.

In model B we add variables indicating whether the immigrant is married to a UK born or foreign born wife, the density of own ethnic group at the Census ward level and the number of dependent children. Since the own ethnic densities are calculated for all ethnic minority residents,

both immigrants and native born, they will over-estimate the extent of linguistic compatibility. The resulting coefficients may therefore underestimate their true effect on language fluency.

The expected effect of the presence of children in the household is not clear. Therefore indicators of the age of the oldest child (corresponding to their levels of schooling) are added to model C in order to investigate the children as translators hypothesis more clearly. We also investigate whether the individual's long-term health or whether they are sending remittances to their home country are statistically associated with language skill acquisition in the final model.

Table 3 reports the coefficients, their standard errors and the marginal effects[6] of our three probit models of the determinants of English language (speaking) fluency. Since the inclusion of the extra variables significantly improves the maximum log-likelihood of each successive model we only discuss the results of model C here.[7] Compared to the actual probability of fluency of 0.582 the model predicts the probability of fluency for a male immigrant, holding all characteristics at their sample means, to be 0.637. As Chiswick and Miller's (1992, 1995) model anticipates English language speaking fluency is statistically associated with age at immigration. Increasing years since immigration significantly increases the probability of language fluency (by 0.017 per year). Holding age constant, there is a double benefit from immigrating young. Not only is the person more efficient at acquiring language skills but also they are subject to greater exposure to the English language through more years spent in the United Kingdom after immigration.

As would have been anticipated from Table 2 being Black and born in the Caribbean, and being an African Asian, are associated with significantly increased probability of fluency, when compared to Indians. The marginal effects are 0.394 and 0.104, respectively. All the other groups are insignificantly different from Indians in terms of their language skills. Interestingly, being married to someone born in the United Kingdom is associated with a lower probability of fluency in the English language than being married to a fellow immigrant. The latter group are significantly more likely to be fluent (marginal effect = 0.145) compared to those who are single.

However, having one or two dependent children is associated with a significant increase in the probability of fluency (by 0.182 and 0.178, respectively) compared to an equivalent immigrant with no dependent children. Controlling for the number of children, those men with school age or older children are significantly less likely to be fluent than those with none. The marginal effects are large (e.g. -0.266 for the oldest child aged > 15). It may be the case that having older children increases the likelihood of their acting as translators, and therefore reduces the need to attain fluency.

Educational attainment is clearly a crucial factor associated with English language speaking ability. Any qualification significantly improves the probability of being assessed as fluent by the interviewer over (an otherwise identical person with) no qualifications. Possession of a degree (or equivalent) highest qualification has a marginal effect of 0.512, whilst the effects of A-levels (0.358), vocational qualifications (0.398) and O-levels (0.272) are also large. Evidently learning skills increase the efficiency of language acquisition and, given that many immigrants completed their education in the UK, higher levels of education will increase exposure to the English language. The economic incentives may also be greater for the more highly educated, as the wage premium for undertaking a professional job that requires fluency would be larger than for a manual job, not requiring fluency. Thus English language skills may complement existing human capital and improve its transferability.

With regard to location, only residing in Greater London is significantly associated with improved fluency, when compared to living in the Midlands. The marginal effect is 0.152. It may be the case that the greatest economic benefits to fluency are to be found in Greater London, holding other factors constant. Compared to a Census ward level own ethnic density of 0-5%, those living amongst 15-33% of their own ethnicity are significantly less likely to be fluent (marginal effect = 0.186). Evidently decreased exposure to English speaking people may be a cause. However, those immigrants living in a ward with >33% own ethnic density are not significantly less likely to be fluent than those in the base category (and their marginal effect is much lower than that of the 15-

33% group). It may be the case that English language training opportunities, either publicly (e.g. through local councils) or privately funded, are concentrated in these areas. However, since the densities include native born as well as immigrant members of these ethnic groups, and we do not know their relative distributions, we must be cautious about these findings. Furthermore, these variables are potentially endogeneous in such models as the locational choice may be partly determined by linguistic ability (Dustmann, 1997).

As we hypothesised earlier individuals who have a long-term health problem are less likely to have attained fluency. The marginal effect of -0.205 suggests that this is of substantial importance, even though the coefficient is significant at only the 20% level. Finally, being a remitter is statistically associated with a lower probability of fluency (M.E. = -0.128). This finding provides some evidence to support the contention that remitters are more attached to their country of origin, more likely to return migrate and therefore less likely to invest in location-specific human capital such as language fluency.

5. The determinants of occupational success

Using our measure of occupational success, the (natural logarithm of the) mean gross hourly wage according to the 3-digit Standard Occupational Classification (derived from the Quarterly Labour Force Surveys between 1993 and 1995), we estimate our models using Ordinary Least Squares (OLS). The independent variables in model 1 are the standard human capital measures of experience (proxied by age and its square), education (our highest qualification measures), marriage and locational dummies. Following Chiswick (1978) we also include years since immigration[8] and country of birth variables. Finally, our measure of English language (speaking) fluency is also an explanatory variable. Model 2 adds the work-related characteristics of sector of employment and firm size to the model 1. Both models have R^2 of about 0.40, which is typical of such studies. Since an F-test indicates that the null hypothesis (that the coefficients on the additional variables in the extended model are jointly zero) can be rejected at the 5% level (F-statistic = 6.67, F(6, 541) critical

value = 2.10) we will only discuss the results from the model 2 below. It is straightforward to see from Table 4 that our findings are reasonably robust across both models.

Controlling for years since immigration, age has a non-linear effect on occupational success. The mean occupational wage increases with age upto about 33 years of age, but thereafter declines slowly. Time spent in the United Kingdom clearly significantly increases occupational success, holding all other characteristics constant. The effect is an increase in the mean occupational wage of about four percentage points for an additional ten years since immigration. Only Bangladeshis and African Asians have significantly different occupational attainments from Indians. The former group have a 14% lower mean occupational wage, other things being equal, whilst African Asians are more successful than Indians (6.3% higher mean occupational wages) even after controlling for linguistic ability.

Those ethnic minority immigrants with degree or equivalent highest qualifications are in occupations that, holding other characteristics constant, are paid 29% higher gross hourly wages than the jobs occupied by individuals with no qualifications. Furthermore, possession of A-levels or vocational qualifications significantly raises the mean occupational wage, by about 10%, above the base group. However, there is no significant occupational reward to those with just O-level or equivalent highest qualifications, over those with none. Neither are the married or the locational dummy variables significantly different from their respective base groups.

The incorporation of work-related characteristics adds important detail to the picture of occupation success for these immigrant employees. Compared to similarly endowed individuals in the manufacturing sector, workers in the financial services (8.3%) and other industrial sectors (9.1%) earn significantly greater average wages, whilst those in the non-financial services (-7.6%) are rewarded significantly less. Furthermore, currently working for a large firm (> 50 employees) increases the mean occupational wage by around 4.4%, compared to employees in smaller firms.

Ethnic minority immigrant men who are assessed as fluent in speaking the English language, by their interviewer, are significantly more likely to have higher occupational attainment than

comparable individuals who are not fluent. The effect of fluency is to increase the average hourly wage rate by about 9.2%. This is similar to the 9.4% penalty for poor speaking English ability found by Stewart (1983).[9]

As we mentioned earlier OLS estimates of the effect on language fluency on the earnings of immigrant workers are potentially biased due to the presence of unobserved heterogeneity affecting both language skills and outcomes. This may be because individuals with higher overall ability are more likely to invest in language capital (Chiswick and Miller, 1992, 1995) or arise from self-reported measurement error in the language fluency variable (Dustmann and van Soest, 1998a). Similar concerns surround our estimates of the impact of English language speaking fluency on our measure of occupational success. However, in our data any measurement error would arise from the interviewer systematically miss-classifying language ability. Since the interviewers received specific training for this survey, the interviews took place face to face, usually between members of the same broad ethnic group, and the interviews lasted on average 50.5 minutes we believe that the extent of any measurement error would be far less than that in self-reported data.

Therefore we use the method of instrumental variables (IV; specifically two-stage least squares) in order to obtain unbiased estimates of the coefficient on our English language (speaking) fluency variable. The identifying instruments we use are whether the individuals is married to a UK born spouse, the number of dependent children and the own ethnic density in the Census ward. These instruments are very similar to those used by Chiswick and Miller (1992, 1995) and Chiswick (1998) in their IV estimations.[10] The results are reported in Table 4 for both the basic and extended models of occupational success. In both models 1 and 2 the coefficient on fluency in (speaking) the English language increases by more than a factor of two and the estimates retain some significance. In model 2 fluency now increases the mean occupational wage, over an identical person who is not assessed as fluent, by 20.7%.

To examine the robustness of our results to alternative specifications of the instrumental variable estimations we used different combinations of the instruments used above. In addition, we

use the linguistic nature of the interview as an alternative instrument. This is because these variables are highly, but not perfectly, correlated with interviewer-assessed language fluency, but not likely to be associated with occupational success, and the question from which they are derived is asked just before the language fluency question in the interview. The results are reported in Table 5.

Bound et al. (1995) have argued that the quality of instruments should be checked in two ways before they are used since weak instruments may result in a large bias in IV estimates. Firstly, any potential instruments should significantly improve the model determining the endogenous variable. In our case we report the model improvement (likelihood ratio test) statistics, based on language model 1, which are significant at the 5% level for the inclusion in language model 1 of instrument sets A, A + B and C, but only significant at the 20% level for instrument set B on their own.

The second indicator Bound et al. (1995) suggest is the increase in the adjusted-R^2 measure when the exercise above is carried out. The resulting partial R^2s suggest that adding instrument set A explains 2% more of the variation in language model 1 whilst adding set B only explains 0.9% more. In combination they explain 2.9% but instrument set C appears the most powerful since it appears to explain more than 20% of the variation. These figures compare favourably with Harmon and Walker (1995) who report a partial R^2 of 0.0046, Harmon and Walker (1999) who report partial R^2s between 0.0025 and 0.0078 and Ichino and Winter-Ebmer (1999) who report partial R^2s of 0.003–0.114 for their instruments in their estimates of the returns to schooling in wage equations.[11]

Our results confirm that the OLS estimates are biased downwards. The coefficient on fluency increases in every case, except one whose coefficient is insignificant, with the significant estimates ranging from 0.165 to 0.4847 for model 2. The most powerful sets of instruments suggest a range of 0.165 to 0.244. The effect of language fluency using IV estimation on the OLS estimates of occupational success is similar to that found by others using data on wages for other countries (see note 10).

These results provide some evidence to suggest that there is some unobserved heterogeneity affecting both occupational success and English language fluency. Despite the absence of self-reported measurement error in our data, perhaps it is the case that the interviewers systematically over-classified the language fluency of these respondents. However, as we have argued above this is unlikely to be the case. Alternatively, it may be the case that the most able individuals do not invest in language fluency. Instead their superior motivation or drive may enable them to climb the occupational ladder with poor or fair, rather than fluent, language skills. Furthermore, the reward to fluency for the least able may be the greatest making them more likely, other things being equal, to make such investments. Unfortunately, due to the cross-sectional nature of our dataset, we cannot attempt to identify the potential source of the bias in our OLS estimates, as others have been able to do (Dustmann and van Soest, 1998a, 1998b).

6. Conclusions

In this paper we have estimated the determinants of English language speaking fluency for ethnic minority immigrant men, aged 22 – 64 years old, who live in the metropolitan areas of England. We have derived our sample from the Fourth National Survey of Ethnic minorities, conducted by the Policy Studies Institute in 1994. This data source is advantageous in that a member of the same ethnic group as the respondent conducts the interviews and they may be undertaken wholly or partly in the respondents preferred language. Furthermore, the interviewer assesses the language fluency of the individual, thus avoiding the self-reported measurement errors endemic in similar studies.

Our results broadly confirm Chiswick and Miller's (1995) hypotheses for these immigrants in England. Increasing age at immigration reduces, and more years since immigration increases, language fluency. Black Caribbeans and African Asians are the most likely to be fluent, other things being equal, whilst Pakistanis, Indians and Bangladeshis have the lowest predicted probabilities of fluency. There are clearly synergies between education and fluency and linguistic benefits from residing in Greater London or in a Census ward with low own ethnic group density (0-5%).

However, long-term health problems and remitting money to the country of origin are significantly associated with lower probabilities of English language speaking fluency.

We found that language fluency is the second most important determinant of occupational success, after possession of a degree or equivalent highest qualification, amongst the immigrants in our sample. Using the method of instrumental variables we have shown that the ordinary least squares results under-estimate the importance of fluency to occupational success. Our estimates suggest that being fluent in speaking the English language raises the mean occupational wage by approximately 20% compared to similar individuals who are not fluent.

Since our sample consists of employees, who are already amongst the most successful ethnic minority immigrants in England, there is clearly an important payoff to investing in fluency. Attaining fluency in speaking the English language may be one route out of the low-paid jobs currently occupied by many immigrants in English metropolitan areas. The provision of English language training for these groups could dramatically improve their current and future labour occupational attainment. One specific method would be to encourage the acquisition of vocational or formal qualifications in the United Kingdom, particularly amongst those with no qualifications. This would exploit the double benefit to labour market success from both more education and gaining English fluency. Undoubtedly these policies would also improve the employability of those ethnic minority immigrant men currently unemployed. Additionally, the United Kingdom could introduce an English language fluency requirement into its immigration policy or compulsory English language training as a condition of residence.

Endnotes

[1] Stewart (1983) investigated the role of racial discrimination in the occupational attainment of non-white immigrants in 1975, using the National Training Survey. He includes a poor speaking English dummy variable, and experience before and after immigration (and their respective squares) variables in his estimations of the determinants of the log of average hourly occupational earnings. Gazioglu (1996) examines the impact of English language fluency on the earnings of 280 Turkish and Bangladeshi male immigrants in London. However, these groups account for less than 10% of Britain's ethnic minority population.

[2] This is a similar definition to that used by Nickell (1982) and Stewart (1983) who mapped average hourly earnings by Occupational Unit Group, from the General Household Survey, into the National Training Survey. More recently Harper and Haq (1997) found no difference in their results according to whether they used wages or occupations ranked by mean hourly wages in their study of occupational attainment amongst British men.

[3] See also Gazioglu (1996) for similar findings amongst Turkish and Bangladeshi male immigrants in London.

[4] The highest qualification variables used in this study are our own derivations from the raw data. The questionnaire asks individuals to report all their UK qualifications (33 categories) and all their qualifications gained abroad (9 categories). We have ranked both sets of qualifications and computed the individuals highest UK qualification and highest foreign qualification. This gives the highest qualification for the majority of cases, who have either UK qualifications or foreign qualifications. For those with qualifications obtained in the UK as well as abroad, the UK qualification is taken as the highest qualification. This seems reasonable given that any UK education will have been undertaken at an older age and is therefore likely to be of a higher level. Simple checks on the data confirm this. Finally five dummy variables were created for degree, A-level, O-level and vocational qualifications or their equivalent and for no qualifications. The vocational category is unable to be sub-divided since the foreign qualification categories do no distinguish between different levels.

[5] The inclusion of years since immigration squared did not significantly improve the maximum likelihood of any of the models and thus this variable was omitted.

[6] See note to Table 3 for details.

[7] Likelihood ratio tests (Greene, 1993, p.647) indicate that the null hypotheses that the coefficients on the additional variables in model B (compared to model A; Likelihood Ratio statistic = 20.25) are jointly zero can be rejected at the 5% level (χ^2 (9) critical value = 16.92). Similarly model C is statistically preferred to model B (Likelihood ratio statistic = 13.14; χ^2 (6) 5% critical value = 12.59).

[8] Due to the cross-sectional nature of our data our estimates are subject to Borjas' (1985, 1987) critiques of this methodology. Our estimates of the coefficient on the years since immigration variable may be biased if the average unobserved heterogeneity of immigrants remaining in England varies with time spent in the United Kingdom. This problem will be diminished to the extent that country of birth dummy variables can account for this variation. An F-test rejects the inclusion of a years since immigration squared term in both model 1 (F-statistic = 0.50, F(1,547) critical value = 3.84) and model 2 (F-statistic = 0.31, F(1,541) = 3.84) at the 5% level.

[9] Gazioglu (1996) found a 10-13% earnings benefit for self-reported good or very good English speaking amongst Turks and Bangladeshis.

[10] It is interesting to compare these results with previous studies using international earnings data (t-ratios in parentheses). Chiswick and Miller (1992) found an increase in the partial effect of language fluency on earnings from 0.169 (12.52, OLS) to 0.571 (5.43, IV) using 1980 United States data and veteran status, foreign marriage, children and minority language concentration measures as identifying instruments. They also noted a change from 0.122 (2.43, OLS) to 0.414 (1.34, IV) amongst immigrants in 1981 Canadian data with foreign marriage and minority language concentration measures as identifying instruments. In Australia the results changed from 0.052 (2.52, OLS) in 1981 and 0.083 (4.75, OLS) in 1986 to -.243 (1.20, IV) and 0.043 (0.52, IV), respectively, with foreign marriage, number and age of children and minority language concentration measures as identifying instruments. Chiswick (1998) found an increase from 0.110 (12.66, OLS) to 0.351 (4.25, IV) using 1983 data from Israel using Tel Aviv, Jerusalem, foreign marriage, number of children, and minority language concentration measures as identifying instruments. Dustmann and van Soest (1998a), using German Socio-economic panel data between 1984-1993 found a language effect on earnings increase from 0.0538 (7.08, OLS) to 0.155 (2.28, IV) with father's education measures as identifying instruments.

[11] However, we are unable to compare the power of our instruments with those of previous studies of language and earnings since such information is not provided.

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Table 1. Descriptive statistics (ethnic minority foreign born male employees, age 22-64, living in metropolitan areas of England in 1994)

Variable	Mean	S.E.
Gross hourly (mean occupational) wage	6.14	0.084
Age	39.94	0.418
$(Age)^2/100$	16.94	0.355
Age at immigration	18.42	0.372
$(Age\ at\ immigration)^2/100$	4.18	0.160
Years since immigration	21.52	0.387
Indian (born in India)	0.303	0.019
Bangladeshi (born in Bangladesh)	0.103	0.013
Pakistani (born in Pakistan)	0.205	0.017
African Asian (born in East Africa)	0.212	0.017
Black Caribbean (born in the Caribbean)	0.136	0.014
Chinese (foreign born of Chinese ethnicity)	0.041	0.008
Married	0.858	0.015
Wife UK born	0.108	0.013
Wife foreign born	0.750	0.018
Not married	0.142	0.015
No dependent children (aged < 16)	0.273	0.019
One dependent child (aged < 16)	0.219	0.017
Two dependent children (aged < 16)	0.262	0.019
Three dependent children (aged < 16)	0.142	0.015
> Three dependent children (aged < 16)	0.104	0.013
Oldest child (in household) aged > 15	0.257	0.018
Oldest child (in household) aged 12 -15	0.161	0.016
Oldest child (in household) aged 5-11	0.258	0.018
Oldest child (in household) aged 0-4	0.145	0.015
No children (in household)	0.179	0.016
Degree (or equivalent highest) qualification	0.223	0.018
A-level (or equivalent highest) qualification	0.074	0.011
Vocational (highest) qualification	0.202	0.017
O-level (or equivalent highest) qualification	0.145	0.015
No qualifications	0.356	0.020
Living in the Midlands (metropolitan area)	0.281	0.019
Living in the North (metropolitan area)	0.184	0.016
Living in Greater London (metropolitan area)	0.535	0.021
0 - 5% own ethnic density (in Census ward)	0.228	0.018
5 - 15% own ethnic density (in Census ward)	0.363	0.020
15 - 33% own ethnic density (in Census ward)	0.285	0.019
> 33% own ethnic density (in Census ward)	0.124	0.014
Manufacturing (sector)	0.375	0.020
Non-financial services (sector)	0.223	0.018
Financial services (sector)	0.120	0.014
Public (sector)	0.103	0.013
Transport (sector)	0.080	0.011
Other industrial (sector)	0.099	0.013
Large firm (> 50 employees at the workplace)	0.457	0.021
Long term health problem (that limits work)	0.039	0.008
Remitter (of money to country of origin)	0.296	0.019
Interview conducted wholly in English	0.596	0.021
Interview conducted partly in English	0.264	0.019
Interview conducted wholly in another language	0.140	0.015
Sample Size	565	

Note: Authors own calculations using a sample derived from the Fourth National Survey of Ethnic Minorities. For dummy variables, the values shown are the proportion of the sample for which the value is one. S.E. stands for the standard error of the mean.

Table 2. Proportion fluent in (speaking) the English language by characteristic (sample as Table 1)

Variable	Proportion Fluent	S.E.	T-stat.
Whole sample	0.582	0.021	–
< 10 years old at immigration	0.785	0.040	5.41*
10 – 15 years old at immigration	0.535	0.045	1.24
16 – 19 years old at immigration	0.571	0.054	0.22
20 – 24 years old at immigration	0.577	0.045	0.13
> 24 years old at immigration	0.473	0.044	2.84*
< 15 years since immigration	0.370	0.044	5.39*
15 – 19 years since immigration	0.593	0.052	0.23
20 – 24 years since immigration	0.644	0.044	1.56+
25 – 29 years since immigration	0.636	0.044	1.35+
> 30 years since immigration	0.672	0.044	2.28*
Indian	0.567	0.038	0.48
Bangladeshi	0.431	0.066	2.44*
Pakistani	0.379	0.045	5.04*
African Asian	0.675	0.043	2.40*
Black Caribbean	0.870	0.039	7.46*
Chinese	0.652	0.102	0.70
Wife UK born	0.574	0.064	0.14
Wife foreign born	0.564	0.024	1.58+
Not married	0.688	0.052	2.16*
No dependent children	0.623	0.039	1.22
One dependent child	0.677	0.042	2.52*
Two dependent children	0.635	0.040	1.54+
Three dependent children	0.450	0.056	2.56*
> Three dependent children	0.322	0.061	4.47*
Oldest child aged > 15	0.524	0.042	1.63+
Oldest child aged 12 – 15	0.516	0.053	1.37+
Oldest child aged 5-11	0.596	0.041	0.38
Oldest child aged 0-4	0.537	0.055	0.89
No children	0.743	0.044	3.95*
Degree qualification	0.833	0.033	7.88*
A-level qualification	0.690	0.072	1.55
Vocational qualification	0.789	0.038	5.77*
O-level qualification	0.488	0.056	1.85*
No qualifications	0.323	0.033	9.92*
Living in the Midlands	0.447	0.040	4.09*
Living in the North	0.462	0.049	2.73*
Living in Greater London	0.695	0.027	5.98*
0 – 5% own ethnic density	0.682	0.041	2.72*
5 – 15% own ethnic density	0.580	0.035	0.07
15 – 33% own ethnic density	0.528	0.039	1.64+
> 33% own ethnic density	0.529	0.060	0.96
Long term health problem	0.409	0.107	1.65#
Remitter	0.551	0.039	0.97
Interview conducted wholly in English	0.881	0.018	24.9*
Interview conducted partly in English	0.215	0.034	12.4*
Interview conducted wholly in another language	0.025	0.018	23.3*
Sample Size		565	

Note: Fluency in (speaking) the English language is assessed by the interviewer, who is a member of the same ethnic group as the respondent and fluent in the respondent's other main language. T-stat is the (absolute value of the) T-statistic which tests for the difference between the mean proportion of respondents who are fluent when each characteristic holds and when it does not (i.e. when the dummy variables are 1 and 0). S.E. stands for standard error. *, # and + indicate significance at the 5%, 10% and 20% levels, respectively (critical values = 1.96, 1.645, 1.282).

Table 3. Determinants of fluency in (speaking) the English language: probit estimates (sample as Table 1)

	Model A			Model B			Model C		
Variable	Coeff.	S.E.	M.E.	Coeff.	S.E.	M.E.	Coeff.	S.E.	M.E.
Constant	-.5893	.4072+	–	-.4890	.5165	–	-.6722	.5508	–
Age at immigration	-.1063	.0263*	-.040	-.1171	.0278*	-.044	-.1033	.0291*	-.039
(Age at immigration)^2/100	.1764	.0585*	.067	.1923	.0611*	.072	.1893	.0632*	.071
Years since immigration	.0330	.0088*	.013	.0337	.0095*	.013	.0458	.0117*	.017
Indian	~	–	–	~	–	–	~	–	–
Bangladeshi	.1223	.2402	.046	.1180	.2554	.044	-.0394	.2627	.015
Pakistani	-.1510	.1907	-.058	-.0889	.2023	-.034	-.0744	.2125	-.028
African Asian	.4734	.1842*	.169	.3722	.1917#	.134	.2880	.1961+	.104
Black Caribbean	1.480	.2528*	.398	1.574	.2728*	.405	1.510	.2943*	.394
Chinese	.4465	.3474+	.154	.1806	.3861	.066	.1705	.3927	.062
Wife UK born	~	–	–	.0703	.3062	.026	.1428	.3253	.052
Wife foreign born	~	–	–	.2432	.2128	.093	.3674	.2559+	.145
Not married	~	–	–	~	–	–	~	–	–
No dependent children	~	–	–	~	–	–	~	–	–
One dependent child	~	–	–	.3077	.2052+	.112	.5199	.2364*	.182
Two dependent children	~	–	–	.3275	.1895#	.119	.5052	.2376*	.178
Three dependent children	~	–	–	-.0192	.2136	-.007	.2237	.2687	.081
> Three dependent children	~	–	–	-.4600	.2644#	-.180	-.2382	.3265	-.092
Oldest child aged > 15	~	–	–	~	–	–	-.6915	.2781*	-.266
Oldest child aged 12 – 15	~	–	–	~	–	–	-.5428	.3287#	-.211
Oldest child aged 5-11	~	–	–	~	–	–	-.5735	.3004#	-.221
Oldest child aged 0-4	~	–	–	~	–	–	-.3805	.3155	-.147
No children	~	–	–	~	–	–	~	–	–
Degree qualification	2.002	.2074*	.520	1.972	.2142*	.509	2.013	.2210*	.512
A-level qualification	1.366	.2563*	.357	1.424	.2700*	.359	1.441	.2717*	.358
Vocational qualification	1.286	.1935*	.387	1.364	.2031*	.398	1.379	.2090*	.398
O-level qualification	.7275	.1968*	.242	.8306	.2032*	.266	.8597	.2077*	.272
No qualifications	~	–	–	~	–	–	~	–	–
Living in the Midlands	~	–	–	~	–	–	~	–	–
Living in the North	.0691	.1961	.026	-.0216	.2065	-.008	.0450	.2091	.017
Living in Greater London	.3619	.1549*	.137	.3834	.1648*	.144	.4052	.1681*	.152
0 – 5% own ethnic density	~	–	–	~	–	–	~	–	–
5 – 15% own ethnic density	~	–	–	-.2439	.1991	-.093	-.2077	.2045	-.079
15 – 33% own ethnic density	~	–	–	-.5067	.2078*	-.195	-.4858	.2137*	-.186
> 33% own ethnic density	~	–	–	-.2953	.2473	-.114	-.2984	.2540	-.115
Long term health problem	~	–	–	~	–	–	-.5237	.5237+	-.205
Remitter	~	–	–	~	–	–	-.3340	.1551*	-.128
Actual probability of fluency		0.582			0.582			0.582	
Predicted probability of fluency		0.626			0.633			0.637	
Restricted Log-Likelihood (Slopes = 0)		-383.94			-383.94			-383.94	
Unrestricted Log-Likelihood		-255.65			-245.52			-238.95	
Model ?^{2}		256.59*			276.84*			289.98*	
Degrees of Freedom (?^{2} test)		14			23			29	
Pseudo – R^2_{ANN}		.542			.571			.589	
Sample Size		565			565			565	

Note: ~ indicates an omitted variable. Coeff. is an abbreviation for the estimated coefficient. S.E. stands for standard error. *, # and + indicate significance at the 5%, 10% and 20% levels, respectively. M.E. indicates the marginal effect on the predicted probability of fluency in (speaking) the English language, calculated for an individual with sample mean characteristics. For continuous variables the marginal effect is calculated for an increase of 1 year. For the dummy variables it represents an average person with that particular characteristic as compared to the base characteristic. Pseudo – R^2_{ANN} (the Aldrich and Nelson (1984) measure normalised) was proposed by Veall and Zimmermann (1992) and, amongst the significance-of-fit class of pseudo-R^2s, most closely corresponds to the OLS-R^2 (see Veall and Zimmermann, 1996).

Table 4. Determinants of occupational success: OLS and IV estimates (sample as Table 1)

	Model 1				Model 2			
	OLS		IV		OLS		IV	
Variable [Model 3 only]	Coeff.	SE.	Coeff.	SE.	Coeff.	SE.	Coeff.	SE.
Constant	1.298	.1620*	1.240	.1767*	1.364	.1597*	1.315	.1727*
Age	.0130	.0080+	.0164	.0090#	.0110	.0078+	.0139	.0087+
(Age)^2/100	-.0184	.0094#	-.0211	.0100*	-.0168	.0091#	-.0191	.0097*
Years since immigration	.0052	.0015*	-.0029	.0028	.0043	.0014*	.0025	.0026
Bangladeshi	-.1871	.0377*	-.1906	.0389*	-.1409	.0384*	-.1467	.0398*
Pakistani	-.0075	.0300	-.0009	.0315	-.0113	.0292	-.0060	.0304
African Asian	.0646	.0287*	.0479	.0342+	.0629	.0282*	.0493	.0329+
Black Caribbean	-.0389	.0365	-.0873	.0626+	-.0291	.0356	-.0705	.0610
Chinese	-.0550	.0528	-.0675	.0557	-.0285	.0527	-.0401	.0555
Married	.0102	.0302	.0052	.0314	.0072	.0295	.0034	.0305
Degree qualification	.3327	.0324*	.2538	.0885*	.2903	.0335*	.2284	.0808*
A-level qualification	.1255	.0426*	.0682	.0738	.1015	.0425*	.0565	.0687
Vocational qualification	.1241	.0303*	.0708	.0635	.1045	.0299*	.0621	.0587
O-level qualification	-.0022	.0324	-.0302	.0442	.0011	.0317	-.0241	.0422
Living in the North	-.0144	.0303	-.0185	.0314	-.0174	.0295	-.0206	.0304
Living in Greater London	-.0231	.0248	-.0384	.0300	-.0198	.0249	-.0312	.0288
Non-financial services	~	–	~	–	-.0762	.0296*	-.0769	.0302*
Financial services	~	–	~	–	.0831	.0347*	.0649	.0414+
Public	~	–	~	–	.0702	.0373#	.0628	.0391+
Transport	~	–	~	–	-.0449	.0390	-.0453	.0398
Other industrial	~	–	~	–	.0913	.0363*	.0762	.0411#
Large firm	~	–	~	–	.0441	.0215*	.0401	.0225#
English language fluency	.1108	.0249*	.2437	.1406#	.0923	.0244*	.2067	.1375+
Adjusted R^2	.377		.345		.414		.390	
F statistic	22.4*		20.2*		19.1*		17.8*	
Sample Size	565		565		565		565	

Note: The dependent variable is the natural logarithm of the mean gross hourly wage according to the 3-digit standard occupational classification derived from the Quarterly Labour Force Survey of the United Kingdom (1993-1995). Coeff. is an abbreviation for the estimated coefficient. SE. stands for standard error. *, # and + indicate significance at the 5%, 10% and 20% levels, respectively. F-tests indicate that OLS model 2 is a significant improvement over OLS model 1 ($F(6, 542) = 6.72$, 5% critical value = 2.10). The instruments used in the IV estimation procedures are wife UK born, one, two, three and more than three dependent children (aged < 16), 5-15%, 15-33% and more than 33% own ethnic density (in Census ward).

Table 5. The partial effect of fluency in (speaking) the English language: alternative IV estimates (sample as Table 1)

	Model 1		Model 2		Partial R^2	Model Improvement
Instruments	Coeff.	S.E.	Coeff.	S.E.		
OLS estimates	.1108	.0249*	.0923	.0244*	–	–
A = Wife UK born, one, two, three, and more than three dependent children (aged < 16)	.1680	.1601	.0775	.1591	.020	13.9*
B = 5-15%, 15-33% and more than 33% own ethnic density (in Census ward)	.4037	.2988+	.4847	.3120+	.009	5.97+
A + B	.2437	.1406#	.2067	.1375+	.029	20.3*
D = Interview conducted partly in English, Interview conducted wholly in another language	.1710	.0513*	.1649	.0411*	.203	168.6*
Sample Size			565			

Note: *, # and + indicate significance at the 5%, 10% and 20% levels, respectively. The partial R^2 is the increase in the pseudo $-R^2_{ANN}$ when each set of instruments are included in language fluency probit model A. The model improvement measure is a likelihood ratio test (with a $?^2$ distribution) of whether these additional variables jointly have coefficients of zero.