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Returns to dialect
Identity exposure through language in the Chinese labor market

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ABSTRACT

Though Mandarin is China's common language, each region/city has its own dialect. Using a unique self-collected dataset, this paper estimates returns to dialect familiarity in China's largest and most developed city, Shanghai. We evaluate migrant workers' comprehension and fluency of the Shanghai dialect, and instrument their dialect fluency by determining whether the workers' hometowns were located in the *Wu* dialect region and the distance between those hometowns and Shanghai. We determined that in OLS regressions, the returns to dialect are a consequence of endogeneity bias. After using IV (instrumental variable), dialect fluency was shown to significantly impact one's income in the service industry, in particular affecting sales jobs. In manufacturing and construction jobs, migrants with higher dialect fluency tended to be self-employed in order to earn more income. By distinguishing between listening and speaking abilities, we found that auditory comprehension does not significantly increase one's earning, while oral fluency does. Since local residents in Shanghai can understand Mandarin, migrants who can understand Shanghainese won't have difficulty in the information exchange. Therefore, our results confirm that dialect is a channel through which people expose their identity. Speaking the local dialect is a way for migrant workers to integrate into the local society and also to reduce transaction costs in the labor market.

"*A language is a dialect with an army and navy.*"[1]

A dialect is a language without an army and navy.[2]

1. Introduction

China is experiencing rapid urbanization. The urban population accounted for only 20.91% of China's population in 1982 but increased to 52.6% of the population in 2012.[3] According to NBS (National Bureau of Statistics of China, 2013), 236 million Chinese

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[1] Cited from the modern Yiddish linguist, Max Weinreich, in his speech *Der YIVO un di problemen fun undzer tsayt* ("The YIVO and the problems of our time"), originally presented at the Annual YIVO (then known as the Yiddish Scientific Institute) Conference on 5 January 1945.

[2] Conceived by the authors.

[3] Source: The urbanization ratio in 1982 is estimated based on the third population census (NBS, 2012), and the ratio in 2012 was obtained from NBS (2013).

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people live in a place where they do not have a local *hukou* (a household registration as a local resident), among whom most are rural-to-urban migrants.[4] In Shanghai, for instance, the 2010 population census shows that the population reached 23 million in 2010, 39% (8.98 million) of which were migrants without local *hukou*. Shanghai's population has increased at an annual rate of 3.24% over the past decade, whereas the population with local *hukou* has experienced a continuous decrease for almost two decades.[5] Due to *hukou* discrimination in the labor market, social security, and public service (Lu, 2013), many migrants choose to return home as they age. Once an individual from a rural area is older than 33, the probability of that individual migrating to a city decreases (Chen, Jiang, Lu, & Sato, 2013). The *hukou* system and the urban–rural divide have led to a lag in urbanization compared to industrialization (Chen, 2013),[6] a shortage of labor in the cities (especially in the coastal areas (Cai & Du, 2011)), a decrease in migrant consumption (Chen, Lu, & Zhong, 2012), and an overall decrease in migrant happiness and trust in cities (Jiang, Lu, & Sato, 2012; Wang, Chen, & Lu, 2009).

Although reform of the *hukou* system has stagnated, especially in big cities, scholars are of the opinion that the *hukou* system should be reformed either by giving migrants local *hukou* identities or by removing discrimination against the non-*hukou* population. However, there are few studies on non-*hukou* factors against migrants' integration into local societies. In reality, a majority of migrants would stay in cities even if they could not obtain local *hukou* (Development Research Center of State Council, 2011). Non-*hukou* factors against social integration would become increasingly important both for migrants living in cities and for urban development in general; needless to say, *hukou* discrimination will be removed in the future.

A great deal of research has been conducted on the assimilation of international migrants in host countries, language return being one of the focuses (Chiswick & Miller, 1995; Chiswick & Repetto, 2000; Mcmanus, 1985, etc.). Language ability is always combined with other factors, such as ethnicity and invisible ability, which causes difficulty in estimating returns to languages. Similarly, in China, many rural-to-urban migrants are moving between regions and speaking different dialects wherever they live. Whether dialect difference is an obstacle to social integration between migrants and local residents remains an open question. Chen et al. (2013) seeks to identify the pure effects of language communication on economic performance. People speaking different Chinese dialects are not visually or ethnically different. Mandarin is the official language for reading and writing; therefore, a dialect only takes the form of spoken language and, thus, solely reflects the role of language in communication and social interaction. Because dialects are associated with regions, Chen et al. (2013) measured differences in dialects based on whether a person's *hukou* belongs to the same dialect region as the city in which they live. The measure that they adopt is an objective index of differences in dialects that avoids measurement errors in self-reported language ability. Because all people from the same region are assigned the same value of the measure, their dialect measurement is not related to individual ability.

Language not only conveys knowledge and information through mutual communication but also forms a channel for identifying whether a person is truly local. Those original local people share the same culture, habits, and ways of thinking, all of which form mutual trust among them; however, that trust score is lower among migrants insofar as the general public, local community, and government institutions are concerned (Wang et al., 2009). Thus, it is interesting to disentangle the "pure language returns" into communication effects and identity effects. In our study, we evaluate the ability of migrant workers to understand and speak the Shanghai dialect, and we instrument dialect ability by whether one's hometown is located in the *Wu* dialect region (denoted by a dummy *wuyu*), the distance between the individual's hometown and Shanghai, and an interaction term between *wuyu* and distance. We find that in OLS regressions, the returns to dialect are largely due to an endogeneity bias. After using instrumental variables (IV), dialect fluency is shown to significantly impact income in service jobs and in sales jobs in particular. In manufacturing and construction jobs, migrants with higher dialect fluency tend to be self-employed and earn more. By distinguishing listening ability from speaking ability, we find that listening ability does not significantly increase earning, whereas speaking ability does. Because local residents in Shanghai can understand Mandarin, migrants who can understand Shanghainese have little difficulty in exchanging information. Therefore, our results confirm that dialect is a channel through which people expose their identity. If local people who share the same values, culture, habits and ways of thinking do not trust migrants who cannot speak the local dialect, then speaking the local dialect becomes a way to integrate into the local society and reduce transaction costs in the labor market.

This paper is structured as follows: Section 2 reviews economics studies on language returns. Section 3 introduces the data we used. Section 4 presents the results of our data analysis, and Section 5 presents three groups of robustness checks. The last section concludes the paper.

2. Literature review

Language is a communication bridge that can generate economic returns. The question is, what type of communication? Language abilities yield returns through two channels, the first being the exchange of valuable information through communications in production. Marschak (1965) discussed the economics of uncertainty that characterize the problems of human information,

[4] *Hukou* is a registration identity that is determined according to the individual's mother's *hukou*, which is usually based on where she was from. *Hukou* is linked with locally financed social security and public services and results in discrimination against migrants, of whom only a limited number can change their *hukou*. It is especially difficult to change a hukou in big cities, such as Shanghai, Beijing and Guangzhou. Please see Chan and Buckingham (2008), Chan (2009) and Lu (2013) for details of the *hukou* system.

[5] Source: *The Data Report of Shanghai's* Sixth Population Census, available at the official website of Shanghai Bureau of Statistics, http://www.stats-sh.gov.cn/sjfb/201105/218819.html.

[6] In 2012, the urban population accounted for 52.6% of the total population in China, whereas secondary and tertiary industries accounted for 89.9% of the total GDP (NBS, 2013).

Source: Edited by the authors.

Fig. 1. Shanghai's districts and county. Source: Edited by the authors.

Table 1
Migrant distribution.

Migrant share of 7 districts	Shanghai Statistical Yearbook 2011	Our survey
Pudong	36.3%	33.0%
Huangpu	3.3%	2.1%
Putuo	6.5%	16.4%
Zhabei	3.6%	3.9%
Minhang	21.6%	19.7%
Baoshan	13.7%	16.0%
Jiading	14.9%	9.0%
Total	100.0%	100.0%

Notes:
1. We calculated the percentages listed in the table based on data from Shanghai Statistical Yearbook, 2011 (NBS, 2012) and on the authors' survey data.
2. We added Luwan's migrant population as listed in Shanghai Statistical Yearbook 2011 to that of Huangpu's to calculate Huangpu's new migrant population.

Table 2
Listen, *Speak* and *Listen-Score* comparisons among jobs.

	CM Jobs	Non-CM Jobs	Sales Jobs	Non-Sales Service Jobs
Listen				
Sample size	106	320	131	189
Mean	2.245	2.338	2.519	2.212
p-Value	0.217		0.006	
t-value	−0.784		2.541	
Speak				
Sample size	106	320	131	189
Mean	1.425	1.519	1.649	1.429
p-Value	0.151		0.010	
t-value	−1.035		2.329	
Listen-Score				
Sample size	100	292	115	177
Mean	6.46	6.575	7.478	5.989
p-Value	0.435		0.020	
t-value	−0.165		2.060	

Notes:
1. The value of the variable *Listen* is the number of the choice made in response to question D1 on the questionnaire, whereas the value of the variable *Speak* is the number of the choice made in response to question D2. Both variables take integral values ranging from 1 to 4. The *Listen-Score* variable measures listening ability as assessed by the interviewers and takes integral values in the range 0–15.
2. CM Jobs include construction and manufacturing jobs, and Non-CM Jobs include Sales Jobs and Non-Sales Service Jobs.
3. Data source: the authors' survey data.

communication, and organization. By decreasing uncertainty in production, language ability increases productivity by promoting production efficiency. In addition, Mcmanus (1985) argued that learning the languages of advanced groups enables access to higher-level technologies. Either way, language ability increases productivity by adding valuable information, which is primarily economic.

The other channel of language returns relates more to social psychology than to pure economics. Contacts among similar people occur at a higher rate than among dissimilar people (McPherson, Smith-Lovin, & Cook, 2001). The psychological literature has demonstrated experimentally that attraction is affected by perceived similarities (Huston & Levinger, 1978). If a demographic similarity tends to indicate shared knowledge (see this argument developed in Mayhew, McPherson, Rotolo, & Smith-Lovin, 1995), then we would expect people to associate with similar individuals for ease of communication and shared cultural tastes. Language is an important dimension of ethnic identity and membership (Pendakur & Pendakur, 2002). Falck, Heblich, Lameli, and Südekum (2012) find that historical dialect similarity significantly promotes current regional migration flows in Germany. If asymmetric information exists in market transactions and if people trust those with similar identities more, then using the same language with high-income communities is a kind of signaling mechanism to construct mutual trust.

Table 3
Hourly earnings according to Shanghainese ability group in different jobs.

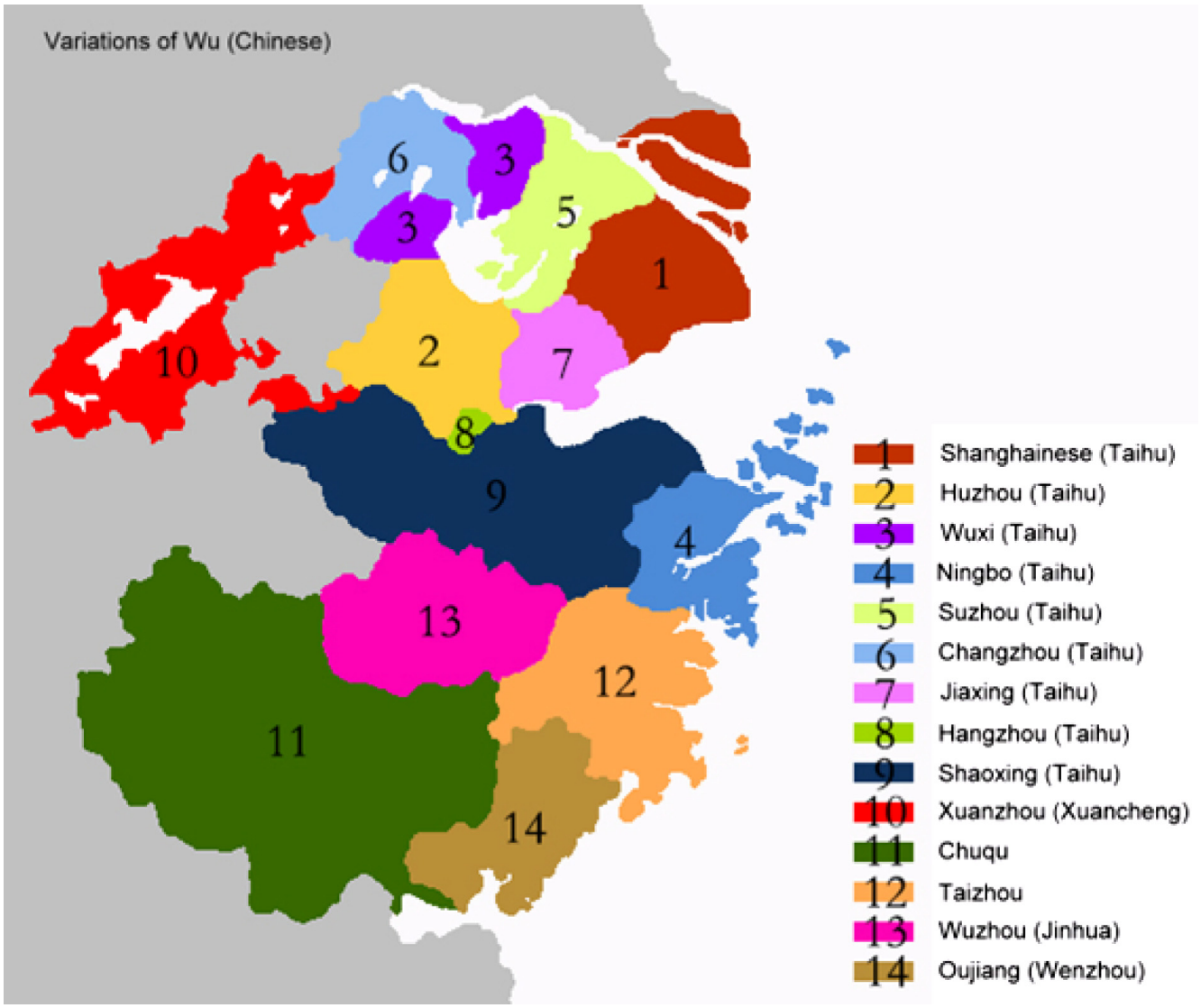
	Speak = 1	*Speak* = 2, 3, or 4	*Listen* = 1	*Listen* = 2, 3, or 4
Hourly earnings in CM Jobs				
Sample size	67	32	26	73
Mean	13.918	21.882	11.441	18.291
p-Value	0.052		0.095	
t-value	−1.6426		−1.323	
Hourly earnings in Sales Jobs				
Sample size	61	43	26	78
Mean	12.868	33.99	11.653	24.920
p-Value	0.003		0.069	
t-value	−2.771		−1.492	
Hourly earnings in Non-Sales Service Jobs				
Sample size	115	50	46	119
Mean	18.915	18.395	14.203	20.518
p-Value	0.460		0.118	
t-value	0.100		−1.188	

Notes:
1. The value of the variable *Listen* is the number of the choice made in response to question D1 on the questionnaire, whereas the value of the variable *Speak* is the number of the choice made in response to question D2. Both variables take integral values ranging from 1 to 4.
2. CM Jobs include construction and manufacturing jobs and Non-CM Jobs include Sales Jobs and Non-Sales Service Jobs.
3. Units of measurement. “Hourly earnings”, 1 yuan.
4. Data source: the authors' survey data.

No matter whether language generates returns through exchanging valuable market information or through signaling social identity, income tends to be associated with language abilities. Early literature estimated the returns to language abilities by regressing immigrants' earnings on their destination language abilities. Mcmanus (1985), Chiswick and Miller (1995), and Chiswick and Repetto (2000) found positive economic returns to immigrants' destination language skills in the US, Australia, and Israel, respectively. Immigrants' native languages are rarely used after immigration; in contrast, destination languages are necessary skills for daily work, study, and life. Consequently, economic returns to immigration destination languages largely reflect the first channel of language fluency returns, thereby providing productive information. Furthermore, immigrants are often faced with identity discrimination, which indicates that the returns to language abilities might be based on a mixture of both channels.

Empirical studies on language returns face the potential endogeneity issue that creates bias in the estimation. First, language ability may represent many personal characteristics that generate economic returns. Innate ability, working attitudes, and family background are all unobservables that are correlated with language ability and may cause missing-variable bias. Second, the reverse causality could also exist if wealthier people can afford to invest in their language skills or if poorer people are willing to invest in language training. This simultaneity issue may also bias language return estimates. Additionally, language ability is a difficult variable to measure. Using self-reported measurements of language fluency that contain measurement errors may create bias regarding the estimate of language returns towards zero.

Some studies on the economic returns to second language abilities reveal the potential endogeneity bias. Christofides and Swidinsky (2008) found that in Quebec, those bilinguals who work exclusively in French enjoy higher pay than unilingual



Source: http://en.wikipedia.org/wiki/Wu_Chinese & The Language Atlas of China, *the Chinese Academy of Social Science and the Australian Academy of Humanities* (1987), edited by the authors.

Fig. 2. The *Wu* dialect region. Some areas of Jiangxi and Fujian Provinces are included in Area 11, and some areas of Anhui Province are included in Area 10.

Francophones. This means that the economic effects of English language skills are contained essentially as language *knowledge* rather than language *use* in market-related activities. These authors therefore suggested that language skills may simply signal unobservable labor market characteristics, such as ability, cognition, perseverance, and quality of education, all of which are associated with labor productivity. Pendakur and Pendakur (2002) studied economic returns on minority language abilities in Canada's three largest urban areas and found that depending on the majority language, knowledge of a minority language is associated with lower earnings, suggesting a negative effect of infrequently used languages. Based on this line of research, not knowing a second language has little effect on daily work and lives. Thus, the returns to or the losses incurred by the second language arise from two sources: signals based on unobserved labor market related characteristics and discrimination based on minority identities.

More recent studies have used panel data analyses or instrumental variables to control for endogeneity. Dustmann and Soest (2001) used panel data to address endogeneity and found that these data are more likely to overreport than underreport language abilities, indicating that returns to language fluency are more likely to be underestimated with measurement errors. Panel data analysis is not valid if missing variables are time-variant; therefore, the instrumental variable method is more frequently used to address endogeneity. Chiswick and Miller (1995) measured language ability in earning regression functions based on whether individuals were married overseas, the number of children they had and the ages of the children, and on minority-language/birthplace concentration variables. The minority-language concentration variable is defined as the proportion of the population aged 15–64 that reports the same minority language in the region where the respondents live. The authors made comparisons among their analyses using instrumental variables in the US, Australia, Canada, and Israel. Although the conclusions were inconsistent, most of their regressions revealed that coefficients of the language indicator in OLS regressions are underestimated. The instrumental variables used in this study could affect incomes at the individual level through other unobserved channels. Variables such as whether an individual was married overseas and the number and ages of their children could be related to individual ability or to features that can also affect income; the minority-language/birthplace concentration variable would then capture some social environmental characteristics that impact economic development and, thus, individual incomes. Dustmann and Soest (2001) used the educational level of immigrants' fathers as an instrument variable for language ability. However, Berman, Lang, and Siniver (2003) argued that the father's educational level is associated with other human capital inputs. Bleakley and Chin (2004) used the ages of child immigrants when they arrived in the US. However, the problem is that individuals who arrive in the US earlier in their lives can accumulate factors other than language ability that can directly influence their income levels, such as improved social networking, higher-quality education, and increased cultural adaptation. Gao and Smyth (2011) analyzed returns on standard Mandarin skills for migrants in China's urban labor markets and used the number of children living in the host city and having at least one primary school child in the host city as instrumental variables. However, these variables may also be correlated with individual ability or family incomes and are thus endogenous.

Most literature focuses on returns to speaking ability that actually refer to communication ability, including listening ability (Bleakley & Chin, 2004; Chiswick, 1991; Chiswick & Miller, 1995). Some articles have explored different dimensions of language fluency. Chiswick and Repetto (2000) found that both Hebrew proficiency and literacy matter for immigrants' earnings in Israel. Carnevale, Fry, and Lowell (2001) found that fluency in English alone had a significant effect, but not when combined with

Table 4
Influence of Shanghainese ability on job entry (OLS).

Variable	(1)	(2)	(3)	(4)	(5)	(6)
	CM Jobs		Sales Jobs		Non-Sales Service Jobs	
Age	−0.00297	−0.00299	0.00570**	0.00585**	−0.00272	−0.00286
	(0.00235)	(0.00235)	(0.00248)	(0.00247)	(0.00268)	(0.00268)
Gender	−0.000937	0.00510	−0.0548	−0.0707	0.0557	0.0656
	(0.0458)	(0.0458)	(0.0481)	(0.0483)	(0.0521)	(0.0523)
Education	0.00683	0.00696	0.0152**	0.0153**	−0.0220***	−0.0223***
	(0.00697)	(0.00696)	(0.00733)	(0.00733)	(0.00793)	(0.00794)
Listen	−0.0156		0.0529**		−0.0373	
	(0.0202)		(0.0213)		(0.0230)	
Speak		−0.0293		0.0687**		−0.0394
		(0.0261)		(0.0275)		(0.0298)
Constant	0.333***	0.336***	−0.110	−0.0855	0.776***	0.749***
	(0.127)	(0.125)	(0.134)	(0.131)	(0.145)	(0.142)
Observations	420	420	420	420	420	420
R-squared	0.011	0.013	0.036	0.036	0.027	0.025

Notes:
1. Dependent variables are dummies that indicate whether the interviewee has a certain job. For example, the dependent variables of columns (1) and (2) indicate whether the interviewee has a CM Job, equaling 1 if he/she is employed in this way and 0 if not.
2. The value of the variable *Listen* is the number of the choice made in response to question D1 on the questionnaire, whereas the value of the variable *Speak* is the number of the choice made in response to question D2. Both variables take integral values ranging from 1 to 4.
3. CM Jobs include construction and manufacturing jobs, and Non-CM Jobs includes Sales Jobs and Non-Sales Service Jobs.
4. The value of the variable "education" is the total number of years of education the interviewee has received. The variable "gender" takes the value of 1 for males and 0 for females.
5. Standard errors are listed in parentheses. The stars *, **, and *** indicate significance at 10%, 5%, and 1%, respectively.
6. Data source: the authors' survey data.

reading ability. When speaking, reading, writing, and understanding abilities are all considered, only the ability to understand English has a significantly positive effect on immigrants' earnings.

Compared with the existing literature, this paper aims at obtaining a precise estimation of language returns based on the Chinese context. Many migrant workers enter the Chinese urban labor market speaking dialects that are different from those spoken in the urban area where they seek work. Because China's common language (both spoken and written) is Mandarin and because Chinese people are not visually or racially different, the dialect effect arguably provides a particularly good measure of the pure return to verbal language. Our study is based on a self-collected dataset from Shanghai, a populous and economically developed city in China. Compared to Beijing, another large city in China, Shanghai has attracted more migrants overall, with the migrants originating from neighboring provinces with more diverse dialects; in contrast, Beijing, located in Northern China, has more migrants who share similar dialects from northern dialect regions.

By estimating the economic returns to Shanghai dialect fluency, we attempt to contribute to the literature of language returns in three aspects. First, in addition to self-reported instances of listening and speaking abilities in the Shanghai dialect, we also asked the interviewers to score listening skills after the interviewees had explained the meanings of several sentences recorded by us in the Shanghai dialect. Using this objective and a comparable measurement for different interviewees, we could reduce the measurement error problem and compare the results with self-reported and interviewer-scored listening ability. Second, to control for the endogeneity bias of estimated language returns, we used an instrumental variable based on China's dialect regions. China is divided into seven major dialect regions. We assume that migrants from the same dialect region as locals from Shanghai are more likely to understand and speak the Shanghai dialect. The geographical IV is orthogonal to individual-level abilities, unless different regions have systematically different distributions of ability. Third, we estimated the returns for both speaking and listening abilities. We found significant returns to spoken fluency (especially for salesmen) but almost no significant returns to listening ability. Even if some aged local Shanghai residents do not speak Mandarin, they can understand Mandarin. Therefore, for migrants, no communication problems exist if they can understand the Shanghai dialect. If listening ability does not generate economic returns but speaking ability does, then spoken fluency is arguably a signal of a social group and identity rather than a communication tool that is used to exchange information of market value.

3. Data and descriptive statistics

This study focuses on how local dialect ability affects employment and wages. Different from other studies that use a dummy variable to distinguish migrants from local residents, we compared only migrants with different language capabilities. Thus, we excluded the association between language ability and other factors related to *hukou* identity.

Table 5
Influence of Shanghainese ability on job entry (IV).

Variable	(1)	(2)	(3)	(4)	(5)	(6)
	CM Jobs		Sales Jobs		Non-Sales Service Jobs	
Age	−0.00305	−0.00341	0.00584**	0.00613**	−0.00279	−0.00272
	(0.00254)	(0.00245)	(0.00259)	(0.00253)	(0.00277)	(0.00275)
Gender	−0.0256	0.00376	−0.0517	−0.0842*	0.0773	0.0804
	(0.0500)	(0.0493)	(0.0509)	(0.0508)	(0.0544)	(0.0554)
Education	0.00787	0.00676	0.0146*	0.0153**	−0.0225***	−0.0221***
	(0.00767)	(0.00745)	(0.00781)	(0.00767)	(0.00834)	(0.00837)
Listen	−0.128*		0.127		0.00120	
	(0.0761)		(0.0775)		(0.0829)	
Speak		−0.0711		0.0904		−0.0193
		(0.0819)		(0.0843)		(0.0919)
Constant	0.614***	0.426***	−0.294	−0.129	0.679***	0.703***
	(0.206)	(0.156)	(0.210)	(0.161)	(0.225)	(0.175)
Observations	396	396	396	396	396	396
Instrumental variable	*wuyu*, *dis*, *wuyu_dis*	*wuyu*, *dis*, *wuyu_dis*	*wuyu*, *dis*, *wuyu_dis*	*wuyu*, *dis*, *wuyu_dis*	*wuyu*, *dis*, *wuyu_dis*	*wuyu*, *dis*, *wuyu_dis*
First-stage F-value	11.661	16.349	11.661	16.349	11.661	16.349
R-squared		0.007		0.031	0.021	0.023

Notes:
1. Dependent variables are dummies that indicate whether the interviewee has a certain Job. For example, the dependent variables of columns (1) and (2) indicate whether the interviewee has a CM Job, equaling 1 if he/she is employed in this way and 0 if not.
2. The value of the variable *Listen* is the number of the choice made in response to question D1 on the questionnaire, whereas the value of the variable *Speak* is the number of the choice made in response to question D2. Both variables take integral values ranging from 1 to 4.
3. CM Jobs includes construction and manufacturing jobs, and Non-CM Jobs include Sales Jobs and Non-Sales Service Jobs.
4. The value of the variable "education" is the total number of years of education that the interviewee has received. The variable "gender" takes the value of 1 for males and 0 for females.
5. Instrumental variables include whether (=1) or not (=0) the interviewee originates from the *Wu* dialect region (the variable "*wuyu*"), the linear distance between Shanghai and the interviewee's origin (the variable "*dis*"), and the interaction between these terms (the variable "*wuyu_dis*").
6. Standard errors are in parentheses. The stars *, **, and *** indicate significance at 10%, 5%, and 1%, respectively.
7. Data source: the authors' survey data.

Table 6
Influence of Shanghainese ability on hourly earnings (OLS and IV).

Variable	(1)	(2)	(3)	(4)	(5)	(6)
	OLS		IV		OLS with IV's sample	
Age	−0.0144***	−0.0144***	−0.0140***	−0.0139***	−0.0137***	−0.0140***
	(0.00441)	(0.00439)	(0.00469)	(0.00460)	(0.00454)	(0.00452)
Gender	0.282***	0.247***	0.299***	0.251***	0.292***	0.249***
	(0.0132)	(0.0131)	(0.0930)	(0.0882)	(0.0871)	(0.0865)
Education	0.0415***	0.0418***	0.0415***	0.0427***	0.0428***	0.0423***
	(0.0132)	(0.0131)	(0.0151)	(0.0143)	(0.0139)	(0.0138)
Listen	0.0913**		0.133		0.0986**	
	(0.0375)		(0.163)		(0.0392)	
Speak		0.147***		0.146		0.161***
		(0.0489)		(0.158)		(0.0508)
Constant	2.282***	2.296***	2.150***	2.258***	2.213***	2.244***
	(0.234)	(0.229)	(0.383)	(0.277)	(0.248)	(0.240)
Observations	388	388	369	369	369	369
Instrumental variable			*wuyu*, *wuyu_dis*	*wuyu*, *dis*, *wuyu_dis*		
First-stage F-value			11.0763	13.770		
R-squared	0.131	0.138	0.128	0.139	0.130	0.139

Notes:
1. Dependent variables are the logarithms of wages per hour.
2. The value of the variable *Listen* is the number of the choice made in response to question D1 on the questionnaire, whereas the value of the variable *Speak* is the number of the choice made in response to question D2. Both variables take integral values ranging from 1 to 4.
3. CM Jobs include construction and manufacturing jobs, and Non-CM Jobs include Sales Jobs and Non-Sales Service Jobs.
4. The value of the variable "education" is the total number of years of education that the interviewee has received. The variable "gender" takes the value of 1 for males and 0 for females.
5. Instrumental variables include whether (=1) or not (=0) the interviewee originates from the *Wu* dialect region (the variable "*wuyu*"), the linear distance between Shanghai and the interviewee's origin (the variable "*dis*"), and the interaction between these terms (the variable "*wuyu_dis*").
6. Standard errors are in parentheses. The stars *, **, and *** indicate significance at 10%, 5%, and 1%, respectively.
7. Data source: the authors' survey data.

The data used in this paper were obtained from a survey we conducted in 2012 on rural-migrant workers in Shanghai. We sent out 514 questionnaires; 488 questionnaires were valid, giving us a response rate of 94.9%. We employed 95 students of Fudan University to work as interviewers; each questionnaire was filled in by two surveyors and asked questions about individual social and economic characteristics, working environment, and Shanghainese abilities. Our survey covered seven representative districts in Shanghai, including Baoshan, Putuo, Pudong, Huangpu, Minhang, Jiading, and Zhabei. Shanghai comprises 16 districts and 1 county. In June 2011, the Luwan district was merged into the Huangpu district; our survey covered the new Huangpu district. The districts we surveyed represent the downtown and suburban areas of Shanghai (please see Fig. 1 for the location of our sampled districts, which are underlined) and represent 59.3% of the total population and 62.1% of the migrants in Shanghai in 2011 (Table 1).[7] We employed proportional sampling according to the distribution of the migrant population among the abovementioned seven districts calculated from the *Shanghai Statistical Yearbook 2011*. The Putuo district is relatively over-sampled because a government staff member assisted us in approaching more migrants who were working in services within that region.

To measure dialect skills, we asked the following two questions to measure self-reported listening and speaking abilities:

D1 *Can you understand (listen to) Shanghainese?*
(1) *Not at all*;
(2) *Understand only some pieces and guess at the meaning of the whole sentence*;
(3) *Roughly understand with a little difficulty*;
(4) *Totally understand.*

D2 *Can you speak Shanghainese?*
(1) *Not at all*;
(2) *Can occasionally speak one or two sentences*;
(3) *Can roughly speak Shanghainese for daily life and work communications*;
(4) *Can totally communicate with locals in Shanghainese.*

We use the choices offered in question D1 to measure the value of the *Listen* variable and the choices offered in question D2 to measure the value of the *Speak* variable.[8]

[7] Authors' calculation based on data from *Shanghai Statistical Yearbook 2011* (Shanghai Bureau of Statistics, 2012).
[8] We also generate the dummy variables *Listen2*, *Listen3*, and *Listen4*. *Listen2* equals 1 if D1 = 2, 3, or 4 and equals 0 otherwise; *Listen3* equals 1 if D1 = 3 or 4 and equals 0 otherwise; and *Listen4* equals 1 if D1 = 4 and equals 0 otherwise. Similarly, we generate the dummy variables *Speak2*, *Speak3*, and *Speak4*. *Speak2* equals 1 if D2 = 2, 3, or 4 and equals 0 otherwise; *Speak3* equals 1 if D2 = 3 or 4 and equals 0 otherwise; and *Speak4* equals 1 if D2 = 4 and equals 0 otherwise. Our main findings in this paper do not change if we use *Listen2*, *Listen3*, or *Listen4* to replace *Listen* or use *Speak2*, *Speak3*, or *Speak4* to replace *Speak*.

Table 7
Influence of Shanghainese ability on hourly earnings for different jobs (OLS).

Variable	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	CM Jobs		Non-CM Jobs		Sales Jobs		Non-Sales Service Jobs	
Age	0.000850	0.000204	−0.0220***	−0.0214***	−0.0120	−0.0101	−0.0288***	−0.0271***
	(0.00648)	(0.00656)	(0.00553)	(0.00551)	(0.00935)	(0.00912)	(0.00695)	(0.00697)
Gender	0.245**	0.248**	0.243**	0.201*	0.0919	0.00105	0.351***	0.324**
	(0.116)	(0.117)	(0.105)	(0.105)	(0.172)	(0.169)	(0.133)	(0.134)
Education	0.0229	0.0295	0.0456***	0.0456***	0.0976***	0.0964***	0.0173	0.0200
	(0.0209)	(0.0208)	(0.0158)	(0.0157)	(0.0296)	(0.0287)	(0.0186)	(0.0188)
Listen	0.131**		0.0998**		0.0882		0.116*	
	(0.0559)		(0.0454)		(0.0727)		(0.0591)	
Speak		0.153**		0.137**		0.239***		0.0504
		(0.0758)		(0.0589)		(0.0866)		(0.0825)
Constant	1.879***	1.913***	2.507***	2.537***	1.824***	1.649***	2.847***	2.973***
	(0.347)	(0.349)	(0.290)	(0.285)	(0.536)	(0.507)	(0.348)	(0.349)
Observations	99	99	275	275	107	107	168	168
R-squared	0.135	0.123	0.167	0.169	0.174	0.220	0.198	0.181

Notes:
1. Dependent variables are the logarithms of wages per hour. The second row of this table indicates the subsample that each regression uses. For example, regressions (1) and (2) use subsamples engaged in CM Jobs.
2. The value of the variable *Listen* is the number of the choice made in response to question D1 on the questionnaire, whereas the value of the variable *Speak* is the number of the choice made in response to question D2. Both variables take integral values ranging from 1 to 4.
3. CM Jobs include construction and manufacturing jobs, and Non-CM Jobs include Sales Jobs and Non-Sales Service Jobs.
4. The value of the variable "education" is the total number of years of education the interviewee has received. The variable "gender" takes the value of 1 for males and 0 for females.
5. Standard errors are in parentheses. The stars *, **, and *** indicate significance at 10%, 5%, and 1%, respectively.
6. Data source: the authors' survey data.

To reduce the measurement error in self-reported language ability, we designed and recorded three Shanghainese sentences. The three recorded sentences were as follows:

1. *I can understand some Shanghainese, but cannot speak it.*
2. *Is the person standing by the window your manager?*
3. *Where is No. 222, Block 850, West Yan'an road junction?*

During the survey, our interviewers used broadcasting devices to play the three sentences for each interviewee twice. After listening to the recording, the interviewees reported the meanings of the sentences in Chinese Mandarin. For each sentence, we chose three key words. An interviewee earned one point for each key word if our interviewers thought that the interviewee had understood the word. Thus, interviewees could earn 0–3 points for each sentence in terms of key word recognition. Additionally, for each sentence, interviewers scored 0–2 on interviewees' general understanding of the entire sentence. We added the recognition scores and general comprehension scores for the three sentences, generating the *Listen-Score* variable, which therefore takes values from 0 to 15.[9]

We denote construction and manufacturing jobs as CM Jobs and jobs other than CM Jobs as Non-CM Jobs (or Service Jobs). Within Service Jobs, we distinguish between Sales Jobs, which require more frequent social interaction, and Non-Sales Service Jobs.

Language is used as a tool for daily communication and information exchange; therefore, we hypothesize that migrants with higher dialect abilities will selectively enter service sectors that require more face-to-face interactions. In Table 2, there are no significant differences in listening (self-reported *Listen* and interviewer-scored *Listen-Score*) or speaking (*Speak*) abilities between CM Jobs and Non-CM Jobs; on the contrary, both listening (self-reported *Listen* and interviewer-scored *Listen-Score*) and speaking (*Speak*) skills are significantly higher in Sales Jobs than in Non-Sales Service Jobs. This finding is consistent with our hypothesis.

If language skills have returns, then those skills should also affect labor income, especially in the service sector where greater social interaction is required. Table 3 shows something different than our hypothesis. In the service sector, only those in Sales Jobs received a significantly positive return for speaking and listening skills. Contrary to our expectations, even in the non-service sector (CM Jobs), hourly earnings are significantly higher for those who are conversant in Shanghainese. In turn, this result leads to a more accurate econometric analysis, which is explained below.

4. Empirical results

This section estimates the effects of dialect on job entry and wages. As noted in the existing literature, language measurement is often an endogenous variable that is associated with other unobservables, such as innate abilities. Measurement error is also a

[9] Those who chose choice 1 in question D1 are automatically assigned 0 for *Listen-Score*.

Table 8
Influence of Shanghainese ability on hourly earnings in different jobs (IV).

Variable	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	CM Jobs		Non-CM Jobs		Sales Jobs		Non-Sales Service Jobs	
Age	0.000700	−0.000954	−0.0219***	−0.0214***	−0.00434	−0.00236	−0.0271***	−0.0282***
	(0.00641)	(0.00660)	(0.00583)	(0.00589)	(0.0114)	(0.0110)	(0.00766)	(0.00713)
Gender	0.242**	0.244**	0.282**	0.156	0.179	−0.161	0.320**	0.307**
	(0.116)	(0.117)	(0.119)	(0.116)	(0.204)	(0.222)	(0.148)	(0.137)
Education	0.0208	0.0284	0.0452***	0.0394**	0.109***	0.102***	0.0165	0.0128
	(0.0214)	(0.0207)	(0.0173)	(0.0179)	(0.0357)	(0.0343)	(0.0200)	(0.0199)
Listen	0.167		0.213		0.460*		0.00265	
	(0.111)		(0.173)		(0.277)		(0.216)	
Speak		0.273**		0.413**		0.664**		0.172
		(0.122)		(0.188)		(0.319)		(0.194)
Constant	1.825***	1.795***	2.193***	2.182***	0.447	0.682	3.054***	2.890***
	(0.368)	(0.359)	(0.472)	(0.370)	(0.994)	(0.768)	(0.519)	(0.400)
Observations	97	97	258	258	98	98	160	160
Instrumental variable	*wuyu*, *dis*, *wuyu_dis*	*wuyu*, *dis*, *wuyu_dis*	*dis*, *wuyu_dis*	*wuyu*, *dis*, *wuyu_dis*	*dis*, *wuyu_dis*	*dis*, *wuyu_dis*	*wuyu*, *dis*	*wuyu*, *dis*, *wuyu_dis*
First-stage F-value	10.129	18.855	10.538	10.671	4.805	4.972	6.609	11.364
R-squared	0.135	0.102	0.151	0.112	0.006	0.110	0.173	0.167

Notes:
1. Dependent variables are the logarithms of wages per hour. The second row of this table indicates the subsample that each regression uses. For example, regressions (1) and (2) use subsamples who are engaged in CM Jobs.
2. The value of the variable *Listen* is the number of the choice made in response to question D1 on the questionnaire, whereas the value of the variable *Speak* is the number of the choice made in response to question D2. Both variables take integral values ranging from 1 to 4.
3. CM Jobs include construction and manufacturing jobs, and Non-CM Jobs include Sales Jobs and Non-Sales Service Jobs.
4. The value of the variable "education" is the total number of years of education the interviewee has received. The variable "gender" takes the value of 1 for males and 0 for females.
5. Instrumental variables include whether (=1) or not (=0) the interviewee originates from the *Wu* dialect region (the variable "*wuyu*"), the linear distance between Shanghai and the interviewee's origin (the variable "*dis*"), and the interaction between these terms (the variable "*wuyu_dis*").
6. Standard errors are in parentheses. The stars *, **, and *** indicate significance at 10%, 5%, and 1%, respectively.
7. Data source: the authors' survey data.

concern. Although our self-reported listening and speaking skills also suffer from measurement error problems, our language ability score for listening is based on an objective assessment by the interviewers. To address the estimation bias associated with endogeneity and measurement error, we relied on an instrumental variable estimation based on the Chinese context. China is divided into seven major dialect regions, namely, *north*, which is closest to Mandarin, *kejia*, *xiang*, *wu*, *yue*, *min*, and *gan*. The *Wu* dialect is different from other dialects, both lexically and intelligibly. A study conducted on the quantification of Chinese dialect affinity shows that the average lexical correlation coefficient between the Suzhou dialect (a branch of the *Wu* dialect) and dialects outside the *Wu* dialect region is 26.0%, and that this coefficient is 20.5% for the Wenzhou dialect, another branch of the *Wu* dialect (Cheng, 1982). Using experimental tests, Tang and van Heuven (2009) show that listeners outside the *Wu* dialect region can, on average, correctly translate 12.3% of target words in sentences spoken by Suzhou dialect speakers and 6.25% of target words in sentences spoken by Wenzhou dialect speakers. Shanghai is located in the *Wu* dialect region, which covers the southern portion of the Jiangsu Province and almost all of Zhejiang Province. We distinguished the *Wu* dialect region according to the *Language Atlas of China*, which was compiled by the Chinese Academy of Social Science and the Australian Academy of Humanities in 1987 (see Fig. 2). We also measured the linear distances between Shanghai and migrants' origins using Google Maps.[10] Shanghainese is one branch of the *Wu* dialect, and people from the *Wu* dialect region are more likely to understand or speak Shanghainese. Thus, our instrumental variables include whether the interviewee's origin lies in the *Wu* dialect region (variable *wuyu*), the linear distance between their origin and Shanghai (variable *dis*), and an interaction term. When the F-value of the weak IV test is greater than 10, we simply use the three instrumental variables. In some regressions, the F-value is less than 10, and we drop *wuyu*, the distance term, or the interaction term, to obtain a higher F-test in the first-stage regression procedure.[11] To control for individual characteristics, we measured education using the number of years of schooling and assigning the gender variable the value of 1 for males and 0 for females.

4.1. Shanghainese ability and job entry

First, we formally tested how language ability affects job entry. Table 4 shows the effects of Shanghainese ability on job entry based on OLS regressions. Dependent variables are dummies that indicate whether there is an influence (value 1) or not (value 0)

[10] Our main findings do not change if we use distance by road to replace linear distance between Shanghai and migrant origin.
[11] In some sub-sample regressions, the sample size is small; therefore, eliminating one instrument and increasing the number of degrees of freedom in the first stage can increase the F value of the weak IV test. However, we do not eliminate the interaction term if its coefficient is significant in the first-stage regression procedure.

Table 9
Influence of Shanghainese ability on hourly earnings in different jobs (IV estimation using self-employed).

Variable	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	CM Jobs		Non-CM Jobs		Sales Jobs		Non-Sales Service Jobs	
Age	0.00216	0.00123	−0.0224***	−0.0219***	0.000383	0.000899	−0.0270***	−0.0281***
	(0.00602)	(0.00612)	(0.00587)	(0.00595)	(0.0128)	(0.0118)	(0.00764)	(0.00710)
Gender	0.244**	0.241**	0.285**	0.160	0.144	−0.194	0.309**	0.297**
	(0.108)	(0.108)	(0.118)	(0.116)	(0.206)	(0.229)	(0.148)	(0.137)
Education	0.0290	0.0297	0.0453***	0.0396**	0.105***	0.0996***	0.0181	0.0146
	(0.0202)	(0.0191)	(0.0173)	(0.0178)	(0.0365)	(0.0345)	(0.0200)	(0.0199)
Self-employed	1.013***	0.942***	0.0629	0.0598	−0.266	−0.196	0.123	0.126
	(0.260)	(0.267)	(0.105)	(0.106)	(0.262)	(0.232)	(0.132)	(0.133)
Listen	0.0271		0.212		0.491*		0.00173	
	(0.111)		(0.174)		(0.286)		(0.215)	
Speak		0.106		0.410**		0.670**		0.166
		(0.123)		(0.188)		(0.319)		(0.192)
Constant	1.970***	1.910***	2.184***	2.173***	0.452	0.741	3.008***	2.848***
	(0.347)	(0.333)	(0.471)	(0.369)	(0.993)	(0.761)	(0.520)	(0.402)
Observations	97	97	258	258	98	98	160	160
Instrumental variable	*wuyu*, *wuyu_dis*	*wuyu*, *dis*, *wuyu_dis*	*dis*, *wuyu_dis*	*wuyu*, *dis*, *wuyu_dis*	*dis*, *wuyu_dis*	*dis*, *wuyu_dis*	*wuyu*, *dis*	*wuyu*, *dis*, *wuyu_dis*
First-stage F-value	13.456	15.743	10.392	10.563	4.621	4.930	6.566	11.345
R-squared	0.239	0.237	0.152	0.115		0.112	0.177	0.172

Notes:
1. Dependent variables are the logarithms of wages per hour. The second row of this table indicates the subsample that each regression uses. For example, regressions (1) and (2) use subsamples who are engaged in CM Jobs.
2. The value of the variable *Listen* is the number of the choice made in response to question D1 on the questionnaire, whereas the value of the variable *Speak* is the number of the choice made in response to question D2. Both variables take integral values ranging from 1 to 4.
3. CM Jobs include construction and manufacturing jobs, and Non-CM Jobs include Sales Jobs and Non-Sales Service Jobs.
4. The value of the variable "education" is the total number of years of education the interviewee has received. The variable "gender" takes the value of 1 for males and 0 for females. "Self-employed" is a dummy and equals 1 if the interviewee is self-employed and equals 0 otherwise.
5. Instrumental variables include whether (=1) or not (=0) the interviewee originates from the *Wu* dialect region (the variable "*wuyu*"), the linear distance between Shanghai and the interviewee's origin (the variable "*dis*"), and the interaction between these terms (the variable "*wuyu_dis*").
6. Standard errors are in parentheses. The stars *, **, and *** indicate significance at 10%, 5%, and 1%, respectively.
7. Data source: the authors' survey data.

on certain jobs. Stronger speaking and listening abilities have negative effects, although not very significant ones, on entering CM Jobs (Table 4, columns 1 & 2) and on Non-Sales Service Jobs (Table 4, columns 5 & 6). On the other hand, both speaking and listening skills significantly increased the probability of entering Sales Jobs (Table 4, columns 3 & 4). This result is consistent with the findings that language skills have higher returns in the service sector, especially in sales and social services, which require greater social interaction (Gao & Smyth, 2011). Education has a significantly positive effect on entering Sales Jobs but a significantly negative effect on entering Non-Sales Service Jobs. Age only increases the probability of entering a Sales Job.

However, when we consider endogeneity and use *wuyu*, *dis*, and *wuyu_dis* as instrumental variables for either *Speak* or *Listen*, language abilities no longer significantly affect job entry.[12] Speaking and listening skills still increase the probability of entering Sales Jobs (Table 5, columns 3 & 4), but the effect is no longer significant. The difference between the OLS and IV results implies that people may selectively learn local dialects to find better jobs.

4.2. Shanghainese abilities and earnings

Table 6 shows the effect of Shanghainese fluency on hourly earnings for the entire sample. Columns 1 and 2 are OLS regressions for speaking and listening skills, respectively. Columns 3 and 4 are 2SLS regressions using *wuyu*, *dis*, and *wuyu_dis* as instrumental variables for Shanghainese listening and speaking abilities. Some interviewees did not report their hometown and are therefore missing from the IV estimation that requires "distance-to-Shanghai" information. Columns 5 and 6 repeat the OLS regressions using the same sample as that used for IV regressions in columns 3 and 4 for comparison. From column 1 to column 6, we see that age has a significantly negative effect on earnings, whereas being male and having more education have significantly positive effects on earnings. In OLS regressions (Table 6, columns 1, 2, 5, and 6), speaking and listening skills both have significantly positive effects on earnings. However, 2SLS regressions (Table 6, columns 3 & 4) show that these significant effects might be due to the endogeneity of language abilities. Again, for the entire sample, we see no significant effects of either Shanghainese speaking or listening skills on earnings.

[12] Although the coefficient of *Listen* is significant in column 1, the significance level is not high, and the result is not robust if we use *Listen2* or *Listen4* instead of *Listen*.

Table 10
Influence of Shanghainese ability on whether people are self-employed in different jobs (IV estimation).

Variable	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	CM Jobs		Non-CM Jobs		Sales Jobs		Non-Sales Service Jobs	
Age	0.000423	−0.000647	0.00722**	0.00725**	0.0158***	0.0153***	−0.000931	−0.00117
	(0.00265)	(0.00255)	(0.00314)	(0.00316)	(0.00460)	(0.00426)	(0.00421)	(0.00385)
Gender	0.0149	0.0126	−0.0422	−0.0747	−0.152*	−0.194**	0.0785	0.0757
	(0.0460)	(0.0436)	(0.0675)	(0.0658)	(0.0801)	(0.0926)	(0.0854)	(0.0786)
Education	−0.00350	−0.000672	−0.00382	−0.00532	−0.0177	−0.0192	−0.0109	−0.0117
	(0.00887)	(0.00789)	(0.00916)	(0.00942)	(0.0119)	(0.0120)	(0.0113)	(0.0114)
Listen	0.0960*		0.0582		0.0719		−0.00184	
	(0.0497)		(0.110)		(0.124)		(0.153)	
Speak		0.154***		0.0984		0.0724		0.0472
		(0.0491)		(0.105)		(0.124)		(0.128)
Constant	−0.161	−0.153	0.134	0.155	0.212	0.331	0.374	0.319
	(0.149)	(0.135)	(0.309)	(0.209)	(0.459)	(0.295)	(0.353)	(0.242)
Observations	103	103	292	292	117	117	175	175
Instrumental variable	*wuyu*, *wuyu_dis*	*wuyu*, *dis*, *wuyu_dis*	*dis*, *wuyu_dis*	*wuyu*, *dis*, *wuyu_dis*	*dis*, *wuyu_dis*	*wuyu*, *wuyu_dis*	*wuyu*, *dis*	*wuyu*, *wuyu_dis*
First-stage F-value	12.222	15.089	9.406	11.963	4.589	7.117	4.378	12.376
R-squared	0.008	0.105	0.029	0.014	0.203	0.195	0.009	0.002

Notes:
1. Dependent variables indicate whether the interviewee is (=1) or is not (=0) self-employed. The second row of this table indicates the subsample that each regression uses. For example, regressions (1) and (2) use subsamples who are engaged in CM Jobs.
2. The value of the variable *Listen* is the number of the choice made in response to question D1 on the questionnaire, whereas the value of the variable *Speak* is the number of the choice made in response to question D2. Both variables take integral values ranging from 1 to 4.
3. CM Jobs include construction and manufacturing jobs, and Non-CM Jobs include Sales Jobs and Non-Sales Service Jobs.
4. The value of the variable "education" is the total number of years of education the interviewee has received. The variable "gender" takes the value of 1 for males and 0 for females.
5. Instrumental variables include whether (=1) or not (=0) the interviewee originates from the *Wu* dialect region (the variable "*wuyu*"), the linear distance between Shanghai and the interviewee's origin (the variable "*dis*"), and the interaction between these terms (the variable "*wuyu_dis*").
6. Standard errors are in parentheses. The stars *, **, and *** indicate significance at 10%, 5%, and 1%, respectively.
7. Data source: the authors' survey data.

Although the language return is not statistically significant after using instrumental variables, the coefficient is positive and is close to its standard error. We therefore propose that dialect abilities only increase income for some jobs. Tables 7 and 8 show the returns to Shanghainese abilities for different jobs based on OLS and 2SLS regressions, respectively.

Spoken fluency significantly increases earnings in CM, Non-CM and Sales Jobs (Table 7, columns 2, 4, and 6) and receives the highest return in Sales Jobs. Controlling for endogeneity, returns to speaking skills remain significant and are even higher (Table 8, columns 2, 4, and 6). Although listening ability significantly increases earnings in CM, Non-CM, and Non-Sales Service Jobs (Table 7, columns 1, 2, and 3), this ability shows no significant effect on earnings after controlling for endogeneity (Table 8, columns 1, 2, and 3). Although the coefficient of *Listen* in column 5 is significant at the 10% level, this coefficient is less significant than that of *Speak* in column 6, both statistically and economically. In addition, this coefficient is no longer significant if we use *Listen2*, *Listen3*, or *Listen4* instead of *Listen*.[13] Thus, we can conclude that listening ability does not generate economic returns except for Sales Jobs, but speaking ability does. In Shanghai, migrants do not experience communication problems because most Chinese natives can speak Mandarin. Even if some locals only speak Shanghainese, migrants who can understand Shanghainese will not have any communication problems. Thus, speaking ability may only act as a signal of a social group and identity rather than as a communication tool used to exchange information of market value.

The regressions shown in Table 9 are similar to those shown in Table 8, except that those shown in Table 9 are calculated including the dummy "self-employed", which indicates whether the migrant is self-employed (value = 1) or not (value = 0). Columns 1 and 2 show that the self-employed have significantly higher earnings when engaged in CM Jobs. After controlling for the self-employ variable, speaking ability retains significantly positive returns in Non-CM and Sales Jobs, but this no longer holds in CM Jobs.

Because it appears that Shanghainese abilities affect income through self-employment, we further examine how these abilities affect the probability of being self-employed (Table 10). We employed 2SLS regressions with a dependent variable indicating whether the workers are self-employed (value = 1) or not self-employed (value = 0). The results show that speaking and listening abilities significantly increase the probability of being self-employed in, and only in, CM Jobs. Combining Tables 9 and 10, we conclude that spoken fluency increases earnings in CM Jobs, but only by increasing the probability of being self-employed in these jobs. Consequently, speaking ability only significantly affects earnings in jobs that are more identity-important; for example, in the Non-CM sector (and particularly in the Sales sector). In CM Jobs, social interactions are required for self-employed

[13] The same applies to the coefficient of *Listen* in column 5 of Table 9.

workers, and dialect skill represents a way to increase mutual trust. These results reveal that language ability might affect earnings by signaling a social group or identity.

5. Robustness checks

5.1. Controlling for self-assessed personal characteristics

The instrumental variables that we used captured regional variations of dialect similarities, which would not directly affect individual income. One cannot argue that unobservable individual variations in innate abilities exist that correlate with regional variables, especially when the variable indicating the number of years of schooling is controlled in the regressions. However, other concerns are that regional culture might be correlated with the instrumental variables that we use and that cultural factors might directly affect individual wages. To avoid these potential estimation biases, we collected three self-assessed personal characteristics (social ability, self-confidence, and work ethic) by asking the interviewees whether they agreed with the following statements:

1. *I feel that it is helpful to make friends with Shanghai natives when working in Shanghai.*
2. *I have many qualities.*
3. *I believe that hard work can change one's life.*

Each answer is given a score ranging from 1 to 5, and this score is denoted by a variable: *social* for statement 1, *self-confidence* for statement 2, and *hard work* for statement 3. Our main results do not change significantly when adding these three personal characteristics to the IV regressions (Table 11). The results still show that speaking ability increases income whereas listening ability does not. The three measurements of personal characteristics do not significantly affect income.

Table 11
Influence of Shanghainese ability on hourly earnings in different jobs (IV estimation controlling for self-assessed personal characteristics).

Variable	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	CM Jobs		Non-CM Jobs		Sales Jobs		Non-Sales Service Jobs	
Age	0.00309	0.00202	−0.0242***	−0.0231***	−0.00415	−0.00229	−0.0295***	−0.0304***
	(0.00630)	(0.00634)	(0.00592)	(0.00618)	(0.0128)	(0.0122)	(0.00756)	(0.00727)
Gender	0.246**	0.241**	0.285**	0.136	0.149	−0.144	0.343**	0.309**
	(0.111)	(0.110)	(0.116)	(0.125)	(0.199)	(0.224)	(0.144)	(0.143)
Education	0.0308	0.0309	0.0420**	0.0323*	0.105***	0.101***	0.0115	0.00548
	(0.0201)	(0.0191)	(0.0178)	(0.0192)	(0.0356)	(0.0339)	(0.0206)	(0.0211)
Self-employed	1.017***	0.951***	0.0481	0.0329	−0.266	−0.224	0.122	0.121
	(0.261)	(0.269)	(0.109)	(0.113)	(0.260)	(0.234)	(0.133)	(0.135)
Listen	0.00820		0.224		0.417		0.0343	
	(0.118)		(0.180)		(0.271)		(0.248)	
Speak		0.0830		0.491**		0.589*		0.240
		(0.124)		(0.227)		(0.309)		(0.224)
Social	0.00161	0.00246	−0.0192	−0.0390	−0.0228	−0.0455	0.0121	−0.000306
	(0.0394)	(0.0389)	(0.0376)	(0.0407)	(0.0684)	(0.0662)	(0.0461)	(0.0456)
Self-confidence	0.0177	0.0166	0.0676	0.0527	0.0265	−0.0328	0.0972*	0.0983*
	(0.0500)	(0.0496)	(0.0480)	(0.0503)	(0.0882)	(0.0947)	(0.0577)	(0.0556)
Hard work	0.0475	0.0418	−0.0153	−0.0117	−0.00607	0.00193	−0.0101	−0.0102
	(0.0460)	(0.0441)	(0.0446)	(0.0465)	(0.0777)	(0.0738)	(0.0558)	(0.0565)
Constant	1.692***	1.658***	2.171***	2.198***	0.823	1.227	2.736***	2.611***
	(0.402)	(0.398)	(0.487)	(0.420)	(1.030)	(0.779)	(0.554)	(0.470)
Observations	95	95	254	254	97	97	157	157
Instrumental variable	*wuyu*, *wuyu_dis*	*wuyu*, *dis*, *wuyu_dis*	*dis*, *wuyu_dis*	*wuyu*, *wuyu_dis*	*dis*, *wuyu_dis*	*dis*, *wuyu_dis*	*wuyu*, *dis*	*wuyu*, *wuyu_dis*
First-stage F-value	11.667	15.137	9.599	11.218	4.559	5.004	4.778	12.402
R-squared	0.246	0.250	0.161	0.085	0.072	0.173	0.194	0.168

Notes:
1. Dependent variables are the logarithms of wages per hour. The second row of this table indicates the subsample that each regression uses. For example, regressions (1) and (2) use subsamples who are engaged in CM Jobs.
2. The value of the variable *Listen* is the number of the choice made in response to question D1 on the questionnaire, whereas the value of the variable *Speak* is the number of the choice made in response to question D2. Both variables take integral values ranging from 1 to 4.
3. CM Jobs include construction and manufacturing jobs, and Non-CM Jobs include Sales Jobs and Non-Sales Service Jobs.
4. The value of the variable "education" is the total number of years of education the interviewee has received. The variable "gender" takes the value of 1 for males and 0 for females. "Self-employed" is a dummy and equals 1 if the interviewee is self-employed and equals 0 otherwise.
5. The variables "social," "self-confidence," and "hard work" are scores obtained using the personal characteristics-related statements 1, 2, and 3, respectively. These variables take integral values in the range 1–5.
6. Instrumental variables include whether (=1) or not (=0) the interviewee originates from the *Wu* dialect region (the variable "*wuyu*"), the linear distance between Shanghai and the interviewee's origin (the variable "*dis*"), and the interaction between these terms (the variable "*wuyu_dis*").
7. Standard errors are in parentheses. The stars *, **, and *** indicate significance at 10%, 5%, and 1%, respectively.
8. Data source: the authors' survey data.

5.2. Interviewee-scored listening ability

As discussed above, it is important for us to conclude that dialect skill is a signaling of identity based on the finding that only spoken fluency, but not listening ability, affects income. However, if self-reported listening ability has a large measurement error, this may bias the estimated return to language ability towards zero. For this reason, we could not firmly conclude that listening ability does not generate returns. To confirm that listening ability does not increase income, we used an interviewee-scored listening skill questionnaire, which is a more objective and comparable measurement to re-estimate the job market outcomes of Shanghainese listening ability. The correlation coefficient between self-reported skills (*Listen*) and interviewee-scored listening ability (*Listen-Score*) is approximately 0.768; this value is high, suggesting that significant changes might not occur when we use *Listen-Score* instead of *Listen*. Table 12 examines, for the main regressions examined above, whether there are sign or significance differences between estimations based on self-reported (*Listen*) and interviewee-scored listening abilities (*Listen-Score*). Odd-numbered columns use *Listen*, and even-numbered columns use *Listen-Score*.

In Table 12 (columns 1 & 2), we controlled the self-employ dummy and found that neither *Listen* nor *Listen-Score* significantly increases earnings in CM Jobs. Combined with the results found in columns 3 & 4, which indicate that both *Listen* and *Listen-Score* significantly increase the probability of being self-employed, we conclude that even if *Listen-Score* had a significant effect on earnings, this effect is only through the self-employment channel. In columns 5–8, we controlled for self-assessed personal characteristics in job-specific earning functions. Only in column 8 is the coefficient of *Listen-Score* significant at the 10% level, but the magnitude of this coefficient is much smaller than that of *Listen* in column 7. Thus, we can conclude that replacing the self-reported listening ability *Listen* with the interviewee-scored *Listen-Score* does not change our main findings in Section 4.

Table 12
Influence of Shanghainese ability on hourly earnings and self-employment (IV and the interviewee-scored listening ability, *Listen-Score*).

Variable	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	CM Jobs		Self-employed in CM Jobs		CM Jobs		Sales Jobs	
Age	0.00216	0.00247	0.000423	−0.000362	0.00309	0.00229	−0.00415	−0.0129
	(0.00602)	(0.00641)	(0.00265)	(0.00306)	(0.00630)	(0.00667)	(0.0128)	(0.0120)
Gender	0.244**	0.246**	0.0149	0.0595	0.246**	0.245**	0.149	0.191
	(0.108)	(0.118)	(0.0460)	(0.0534)	(0.111)	(0.118)	(0.199)	(0.202)
Education	0.0290	0.0277	−0.00350	−0.00144	0.0308	0.0293	0.105***	0.0969***
	(0.0202)	(0.0206)	(0.00887)	(0.00947)	(0.0201)	(0.0206)	(0.0356)	(0.0346)
Self-employed	1.013***	1.022***			1.017***	1.012***	−0.266	−0.253
	(0.260)	(0.285)			(0.261)	(0.282)	(0.260)	(0.256)
Listen/*Listen-Score*	0.0271	0.00210	0.0960*	0.0247**	0.00820	0.00124	0.417	0.0744*
	(0.111)	(0.0236)	(0.0497)	(0.0109)	(0.118)	(0.0262)	(0.271)	(0.0444)
Social					0.00161	0.00443	−0.0228	−0.0374
					(0.0394)	(0.0440)	(0.0684)	(0.0672)
Self-confidence					0.0177	0.0153	0.0265	0.0730
					(0.0500)	(0.0546)	(0.0882)	(0.0865)
Hard work					0.0475	0.0434	−0.00607	−0.0635
					(0.0460)	(0.0502)	(0.0777)	(0.0785)
Constant	1.970***	2.017***	−0.161	−0.124	1.692***	1.762***	0.823	1.833**
	(0.347)	(0.345)	(0.149)	(0.157)	(0.402)	(0.418)	(1.030)	(0.769)
Observations	97	92	103	97	95	91	97	89
Instrumental variable	*wuyu*, *wuyu_dis*	*wuyu*, *wuyu_dis*	*wuyu*, *dis*, *wuyu_dis*	*wuyu*, *dis*	*wuyu*, *wuyu_dis*	*wuyu*, *wuyu_dis*	*dis*, *wuyu_dis*	*dis*, *wuyu_dis*
First-stage F-value	13.456	7.452	12.222	7.417	11.667	5.999	4.559	5.698
R-squared	0.239	0.231	0.008	.	0.246	0.242	0.072	0.158

Notes:
1. Dependent variables are the logarithms of wages per hour, except in columns (3) and (4), which have whether (=1) or not (=0) an interviewee is self-employed as the dependent variable. The second row of this table indicates the subsample that each regression uses. For example, regressions (1) and (2) use subsamples who are engaged in CM Jobs.
2. The value of the variable *Listen* is the number of the choice made in response to question D1 on the questionnaire, whereas the value of the variable *Speak* is the number of the choice made in response to question D2. Both variables take integral values ranging from 1 to 4. The *Listen-Score* variable measures listening ability as assessed by the interviewers and takes integral values in the range 0–15. Odd-numbered columns use *Listen*, whereas even-numbered columns use *Listen-Score*.
3. CM Jobs include construction and manufacturing jobs, and Non-CM Jobs include Sales Jobs and Non-Sales Service Jobs.
4. The value of the variable "education" is the total number of years of education the interviewee has received. The variable "gender" takes the value of 1 for males and 0 for females. "Self-employed" is a dummy, which equals 1 if the interviewee is self-employed and equals 0 otherwise.
5. The variables "social," "self-confidence," and "hard work" are scores obtained using the personal characteristics-related statements 1, 2, and 3, respectively. These variables take integral values in the range 1–5.
6. Instrumental variables include whether (=1) or not (=0) the interviewee originates from the Wu dialect region (the variable "*wuyu*"), the linear distance between Shanghai and the interviewee's origin (the variable "*dis*"), and the interaction between these terms (the variable "*wuyu_dis*").
7. Standard errors are in parentheses. The stars *, **, and *** indicate significance at 10%, 5%, and 1%, respectively.
8. Data source: the authors' survey data.

Table 13.1
Influence of Shanghainese ability on hourly earnings in different jobs (IV estimation controlling for Gross Regional Productivity).

Variable	(1)	(2)	(3)	(4)	(5)	(6)
	CM Jobs			Non-CM Jobs		
Age	0.00711	0.00539	0.00769	−0.0218***	−0.0205***	−0.0221***
	(0.00600)	(0.00622)	(0.00636)	(0.00586)	(0.00616)	(0.00603)
Gender	0.216**	0.222**	0.289**	0.287**	0.119	0.294**
	(0.104)	(0.107)	(0.112)	(0.119)	(0.128)	(0.125)
Education	0.0328*	0.0420**	0.0371*	0.0456***	0.0426**	0.0515***
	(0.0193)	(0.0193)	(0.0198)	(0.0176)	(0.0186)	(0.0178)
GRP	−0.0114***	−0.0108***	−0.0110***	−0.000833	−0.00507	0.00106
	(0.00390)	(0.00371)	(0.00390)	(0.00391)	(0.00478)	(0.00375)
Self-employed	0.865***	0.793***	0.810***			
	(0.253)	(0.266)	(0.278)			
Listen	0.205*			0.240		
	(0.121)			(0.195)		
Speak		0.269**			0.549**	
		(0.127)			(0.263)	
Listen-Score			0.0365			0.0491
			(0.0248)			(0.0324)
Constant	1.706***	1.738***	1.824***	2.147***	2.094***	2.275***
	(0.343)	(0.331)	(0.332)	(0.490)	(0.407)	(0.328)
Observations	97	97	92	258	258	239
Instrumental variable	*wuyu*, *wuyu_dis*	*wuyu*, *dis*, *wuyu_dis*	*wuyu*, *wuyu_dis*	*dis*, *wuyu_dis*	*wuyu*, *wuyu_dis*	*dis*, *wuyu_dis*
First-stage F-value	10.103	14.409	5.959	8.421	8.817	9.281
R-squared	0.304	0.260	0.312	0.142	0.044	0.149

Notes:
1. Dependent variables are the logarithms of wages per hour. The second row of this table indicates the subsample that each regression uses. For example, regressions (1), (2), and (3) use subsamples who are engaged in CM Jobs.
2. The value of the variable *Listen* is the number of the choice made in response to question D1 on the questionnaire, whereas the value of the variable *Speak* is the number of the choice made in response to question D2. Both variables take integral values ranging from 1 to 4. The *Listen-Score* variable measures listening ability as assessed by the interviewers and takes integral values in the range 0–15.
3. CM Jobs include construction and manufacturing jobs, and Non-CM Jobs include Sales Jobs and Non-Sales Service Jobs.
4. The value of the variable "education" is the total number of years of education the interviewee has received. The variable "gender" takes the value of 1 for males and 0 for females. "Self-employed" is a dummy, which equals 1 if the interviewee is self-employed and equals 0 otherwise. "GRP" is the Gross Regional Productivity of the interviewee's origin.
5. The variables "social," "self-confidence," and "hard work" are scores obtained using the personal characteristics-related statements 1, 2, and 3, respectively. These variables take integral values in the range 1–5.
6. Instrumental variables include whether (=1) or not (=0) the interviewee originates from the *Wu* dialect region (the variable "*wuyu*"), the linear distance between Shanghai and the interviewee's origin (the variable "*dis*"), and the interaction between these terms (the variable "*wuyu_dis*").
7. Standard errors are in parentheses. The stars *, **, and *** indicate significance at 10%, 5%, and 1%, respectively.
8. Data sources: the authors' survey data and the *2012 China City Statistical Yearbook* (NBS, 2013).

5.3. Control Gross Regional Productivity (GRP)

In Section 5.1, we controlled self-assessed personal characteristics to avoid the possibility that regional culture might be correlated with the instrumental variables that we used. Even so, one might still worry that the geographical IV we used could affect wages through other channels. Therefore, in this section, we further controlled the 2011 Gross Regional Productivity[14] (GRP) of the individual's origin to see whether there would be significant changes in the results that we obtained above. We chose Gross Regional Productivity because this is a considerably general variable that reflects regional factors, such as infrastructure, education quality, and unobserved culture.

In Tables 13.1 and 13.2, our main results for Shanghainese fluency on hourly earnings in different jobs did not change when Gross Regional Productivity was controlled. In columns 4–12, we did not control for self-employment because, based on the above research, we already knew that self-employment had no significant effect in jobs other than CM Jobs. Only in column 1 is the coefficient of *Listen* significant at the 10% level, whereas *Listen-Score* is always insignificant. In contrast, speaking fluency is significant except in Non-Sales Service Jobs.

6. Conclusions

This paper is the first study to directly measure dialect skill and estimate its returns in the labor market. We selected Shanghai, the largest and the most developed region in Mainland China, for our study and constructed a unique dataset through face-to-face interviews and a questionnaire for migrant workers. Being aware of the endogeneity of dialect abilities, especially the correlation

[14] Gross Regional Productivity data are from the *2012 China City Statistical Yearbook* (NBS, 2013). These data are controlled at the level of cities at the prefecture level and above. The exceptions are autonomous prefectures, for which we could only find the gross regional productivities of their capital cities; in this case, we just use the gross regional productivities of their capital cities.

Table 13.2
Influence of Shanghainese ability on hourly earnings in different jobs (IV estimation controlling for Gross Regional Productivity).

Variable	(7)	(8)	(9)	(10)	(11)	(12)
	Sales Jobs			Non-Sales Service Jobs		
Age	−0.00536	−0.000574	−0.0115	−0.0269***	−0.0282***	−0.0243***
	(0.0115)	(0.0119)	(0.0112)	(0.00778)	(0.00721)	(0.00796)
Gender	0.187	−0.206	0.198	0.325**	0.297**	0.327**
	(0.201)	(0.249)	(0.204)	(0.154)	(0.139)	(0.158)
Education	0.104***	0.110***	0.102***	0.0190	0.0154	0.0326
	(0.0365)	(0.0357)	(0.0364)	(0.0198)	(0.0202)	(0.0206)
GRP	0.00281	−0.00471	0.000161	−0.00364	−0.00637	−0.00100
	(0.00599)	(0.00746)	(0.00679)	(0.00577)	(0.00496)	(0.00456)
Listen	0.431			0.0255		
	(0.281)			(0.274)		
Speak		0.724**			0.291	
		(0.357)			(0.223)	
Listen-Score			0.0771			0.0206
			(0.0503)			(0.0418)
Constant	0.496	0.642	1.360*	3.070***	2.875***	2.698***
	(0.985)	(0.783)	(0.713)	(0.552)	(0.405)	(0.354)
Observations	98	98	90	160	160	149
Instrumental variable	*dis*, *wuyu_dis*	*dis*, *wuyu_dis*	*dis*, *wuyu_dis*	*dis*, *wuyu_dis*	*wuyu*, *wuyu_dis*	*dis*, *wuyu_dis*
First-stage F-value	4.474	4.308	4.753	4.063	13.159	4.524
R-squared	0.037	0.069	0.113	0.184	0.148	0.202

Notes:
1. Dependent variables are the logarithms of wages per hour. The second row of this table indicates the subsample that each regression uses. For example, regressions (7), (8), and (9) use subsamples who are engaged in Sales Jobs.
2. The value of the variable *Listen* is the number of the choice made in response to question D1 on the questionnaire, whereas the value of the variable *Speak* is the number of the choice made in response to question D2. Both variables take integral values ranging from 1 to 4. The *Listen-Score* variable measures listening ability as assessed by the interviewers and takes integral values in the range 0–15.
3. CM Jobs include construction and manufacturing jobs, and Non-CM Jobs include Sales Jobs and Non-Sales Service Jobs.
4. The value of the variable "education" is the total number of years of education the interviewee has received. The variable "gender" takes the value of 1 for males and 0 for females. "Self-employed" is a dummy, which equals 1 if the interviewee is self-employed and equals 0 otherwise. "GRP" is the Gross Regional Productivity of the interviewee's origin.
5. The variables "social," "self-confidence," and "hard work" are scores obtained using the personal characteristics-related statements 1, 2, and 3, respectively. These variables take integral values in the range 1–5.
6. Instrumental variables include whether (=1) or not (=0) the interviewee originates from the *Wu* dialect region (the variable "*wuyu*"), the linear distance between Shanghai and the interviewee's origin (the variable "*dis*"), and the interaction between these terms (the variable "*wuyu_dis*").
7. Standard errors are in parentheses. The stars *, **, and *** indicate significance at 10%, 5%, and 1%, respectively.
8. Data sources: the authors' survey data and the *2012 China City Statistical Yearbook* (NBS, 2013).

between dialect skills and unobserved individual characteristics, we measured dialect skill based on whether one's hometown was located in the *Wu* dialect region, the distance between one's hometown and Shanghai, and an interaction term. We found that in OLS regressions, the returns on dialect are largely due to endogeneity bias. After using IV, dialect skills only significantly affect income in service jobs, and even then, mainly only in sales jobs. In manufacturing and construction jobs, migrants with higher dialect fluency tend to be self-employed to earn more income. By distinguishing listening from speaking abilities, we found that listening ability usually does not significantly increase earnings, whereas speaking fluency does increase earnings. Because local residents in Shanghai can understand Mandarin, migrants who can understand Shanghainese do not have difficulty in exchanging information. Our results confirmed that dialect is a channel through which people expose their identity. Speaking a local dialect is a way to integrate oneself into the local society and to reduce transaction costs in the labor market when interacting with locals.

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