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Jean-Marc Dewaele ^a & Li Wei ^a

^a Department of Applied Linguistics and Communication,
Birkbeck, University of London, 43 Gordon Square, London, WC1H
0PD, UK

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Multilingualism, empathy and multicompetence

Jean-Marc Dewaele* and Li Wei

*Department of Applied Linguistics and Communication, Birkbeck, University of London,
43 Gordon Square, London WC1H 0PD, UK*

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The present study investigates the link between multilingualism and the personality trait of cognitive empathy among 2158 mono- and multilinguals. Data were collected through an online questionnaire. Statistical analyses revealed that the knowledge of more languages was not linked to cognitive empathy. Bilingual upbringing and the experience of having lived abroad were equally unrelated to cognitive empathy. Gender and education level were linked to cognitive empathy. Most interestingly, a small but significant positive correlation emerged between multilingualism (operationalised as advanced levels of proficiency in several foreign languages and frequent use of these languages) and cognitive empathy. Further analysis revealed that frequent use of multiple languages was linked to higher levels of cognitive empathy, which could be interpreted as an indication of multicompetence.

Keywords: multilingualism; personality; cognitive empathy; levels of proficiency in several languages

Introduction

The dominant view among personality psychologists is that personality is more a matter of nature rather than nurture (McCrae et al., 2000; Pervin & Cervone, 2010). Relatively little research has been carried out on the effect of social and environmental factors on personality traits at an individual level. The default position of personality psychologists is that participants are largely monolingual and monocultural, and that the presence of other languages is irrelevant. Pavlenko (2005, p. 3) notes that this ‘monolingual’ view of language exists in linguistics, psychology and anthropology.

As researchers of multilingualism, we are keen to find out whether individuals who are immersed in more than one language and culture would score differently on certain personality dimensions. The trait we will investigate in the present study is empathy.

In the following section we will look at the research which considered cross-cultural and psychological aspects of multilingualism and foreign language acquisition. We will also focus on some key studies on empathy. We will then present our research instruments, including the sociobiographical questionnaire and our adaptation of the Baron-Cohen and Wheelwright (2004) questionnaire to measure

*Corresponding author. Email: j.dewaele@bbk.ac.uk

empathy. We will explain how we adapted the multilingualism measure first presented in Dewaele and Stavans (2012).

Subsequently, we will test five hypotheses using the data collected from 2158 participants worldwide. The findings will be discussed in the subsequent section. Finally, we will present some tentative conclusions.

Research on cross-cultural and psychological aspects of multilingualism

Multilingualism research has focused much more on the cognitive consequences of bi- and multilingualism than on its psychological effects. Bialystok (2010) reported some delays in bilinguals' vocabulary acquisition. An overview of the research in the field, the last 90 years, suggests that bilingualism has no effect on intelligence but has positive effects on metalinguistic awareness and cognitive development (Barac & Bialystok, 2011). Research in the last decennium has focused on the effect of early bilingualism on cognitive abilities known as the executive function. 'These are the processes responsible for attention, selection, inhibition, shifting and flexibility that are at the centre of all higher thought' (p. 37). Adesope, Lavin, Thompson, and Ungerleider (2010) conducted a large-scale meta-analysis of the literature on the cognitive effect of bilingualism on children. The results suggest that bilinguals perform significantly better in abstract and symbolic representation skills, in metalinguistic awareness, in attentional control and in working memory. In a recent study, Bialystok (2010) found that bilingual children outperformed monolinguals on cognitively demanding tasks but also in less effortful tasks where perceptual information from complex stimuli had to be processed, but where inhibition was not needed. Barac and Bialystok (2011) conclude that bilingual advantage 'is not limited to inhibitory control but extends to other aspects of executive function such as monitoring, switching and updating' (p. 54). Poarch and van Hell (2011) have pushed this line of investigation further by comparing not just monolingual and bilingual children but also a group of trilingual children. The authors found that the trilingual children outperformed the two other groups.

Extensive bilingual experience has positive effects through the lifespan, attenuating age-related decline in episodic memory (Schroeder & Marian, 2011).

Bilingual cognitive advantages have traditionally been attributed to an individual's knowledge of two linguistic systems. Some researchers have argued that it is not the bilingualism but rather the biculturalism which gives the cognitive advantage (Leung, Maddux, Galinsky, & Chiu, 2008).

Bilingualism has also been linked to an advantage in divergent thinking, which is one of the major components of creativity (Kharkhurin, 2008). The author attributes this finding to the fact that multilingual/multicultural experience allows individuals to perceive the world through the amalgam of two different conceptual prisms and view events with a wider range of enriched experiences. Kharkhurin (2010) investigated the effect of bilingualism on verbal and nonverbal criterion-referenced creativity indicators of the Abbreviated Torrance Test for Adults among college students, controlling linguistic proficiency and language dominance. Bilinguals were found to perform better on nonverbal creativity, whereas monolinguals scored higher on verbal creativity. The bilinguals outperformed their monolingual peers on an important indicator of creativity namely resistance to premature closure. In other words, they did not jump to conclusions prematurely.¹

One consistent pattern that emerges from research on foreign language anxiety (FLA), both in classroom situations and in multilingual interactions in daily life, is that participants knowing more languages suffer less from FLA in their various languages (Dewaele, 2007, 2010a; Dewaele, Petrides, & Furnham, 2008). FLA has also been found to be lower in the target language if the learner already masters a language belonging to the same family (for example, the knowledge of other Romance languages was linked to lower FLA in French; Dewaele, 2010b). It was suggested that multilinguals are more experienced communicators, able to overcome communicative difficulties, and that their increased communicative confidence translates in lower levels of FLA (Dewaele et al., 2008).

A considerable body of research exists in cross-cultural psychology on the personality traits associated with positive outcomes of immigration (Kim, 2001). Immigrants who are prepared for change and have an adaptive personality, characterised by Openness, strength and positivity, are more likely to be successful in cross-cultural adaptation (p. 85).

The study by Chen, Benet-Martínez, and Harris Bond (2008) found that Neuroticism was the strongest predictor of psychological adjustment of three groups of immigrants in Hong Kong. Balanced bicultural individuals (measured with the Bicultural Identity Integration scale) have been found to score higher on Openness to experience and lower on Neuroticism (Benet-Martínez & Haritatos, 2005). Leong (2007) found that Singaporean students who had opted for an international exchange programme scored higher on Openmindedness, Social Initiative, Flexibility and Emotional Stability compared to a control group who had chosen to remain in Singapore (p. 553). The exchange students who scored higher on Social Initiative experienced fewer cultural and psychological difficulties during their stay abroad, while those who scored high on Flexibility suffered more from depression. Peltokorpi and Froese (2011) also found that western expatriates working in the greater Tokyo who scored higher on Openmindedness, Emotional Stability, Cultural Empathy and Social Initiative were more likely to have psychologically adjusted in Japan.

Dewaele and Van Oudenhoven (2009) reported that young London teenagers who had been born abroad scored significantly higher than locally-born teenagers on the dimensions of Openmindedness and – marginally – on Cultural Empathy, and they scored significantly lower on Emotional Stability. Participants knowing and using at least two languages scored significantly higher on the dimensions of Cultural Empathy and Openmindedness, and scored significantly lower on the dimension of Emotional Stability compared to mere incipient bilinguals, that is, classroom learners of a second language.

Dewaele and Stavans (2012) partially replicated the Dewaele and Van Oudenhoven study with participants residing in Israel. One crucial difference was that the participants were all proficient in at least two languages. It turned out that those knowing more languages (three to six) did not obtain different scores on the personality dimensions. Participants born in Israel scored marginally higher on Emotional Stability compared to those born abroad, and participants with one immigrant parent (but not two) scored higher on Cultural Empathy, Openmindedness and Social Initiative. Participants who had become dominant in Hebrew (either L2, L3 or L4) scored lower than L1-dominant participants on Emotional Stability. High levels of multilingualism (i.e. advanced knowledge and frequent use of various languages) were linked to significantly higher scores on Cultural Empathy,

Openmindedness and Social Initiative. Korzilius, Van Hooft, Planken, and Hendrix (2011) study on the adjustment of international employees of a Dutch multinational company found that foreign language knowledge was linked to significantly higher scores on Openmindedness and Emotional Stability. A positive relationship was also found between self-assessed knowledge of foreign languages and Cultural Empathy (p. 546). The international employees (who were more multilingual) scored higher on Openmindedness and Flexibility than the Dutch employees working in The Netherlands. Non-international employees scored highest on Emotional stability (p. 549).

Ożańska-Ponikwia and Dewaele (2012) looked at the link between personality traits and frequency of use of English L2 as well as self-perceived proficiency in English L2 by adult Polish immigrants living in Ireland and the UK. Statistical analyses revealed that Openness and Self-esteem were significant predictors of frequency of use of English L2, while Openness was the best predictor of self-perceived English L2 proficiency. It thus seems that progress in the L2 depends not just on the immersion in the L2 but also on the L2 user's personality profile resulting in fewer or more social interactions in the L2.

Finally, in a mirror study to the present one (Dewaele & Wei, in press), we used the feedback, obtained through an online questionnaire in English, from 2158 multilinguals from around the world to investigate the link between multilingualism and the measure of Tolerance of Ambiguity (TA), a lower-order personality trait (Herman, Stevens, Bird, Mendenhall, & Oddou, 2010). A significant positive link emerged between the number of languages known to participants and their TA scores. A high level of global proficiency in various languages was linked also to higher TA scores. While growing up bi- or trilingually from birth had no effect on TA, the experience of having lived abroad had a strong positive impact although the effect levelled off after more than one year abroad. TA thus appears to be influenced by an individual's social-linguistic-cultural environment and by that individual's conscious effort to learn new languages and having to fit in a new linguistic and cultural environment. The same study showed no relationship between the number of languages known by participants and their scores on Neuroticism (Dewaele & Wei, in press).

Research on empathy

Empathy refers to the ability 'to tune into how someone else is feeling, or what they might be thinking' (Baron-Cohen & Wheelwright, 2004, p. 193). Empathy plays a crucial role in social interactions as it allows us 'to understand the intentions of others, predict their behaviour, and experience an emotion triggered by their emotion' (p. 193). The authors refer to empathy as 'the "glue" of the social world, drawing us to help others and stopping us from hurting others' (p. 193). Empathy is difficult to define because of its multidimensional nature. It has been conceptualised by social psychologists as having two main strands: '(1) cognitive empathy – "the intellectual/imaginative apprehension of another's mental state" and (2) emotional empathy – "an emotional response to ... emotional responses of others"' (Lawrence, Shaw, Baker, Baron-Cohen, & David, 2004, p. 911). Multiple questionnaires have been developed to measure empathy but Baron-Cohen and Wheelwright (2004, pp. 165, 166) claim that many instruments measured various

aspects, such as social skills, social self-confidence, even-temperedness, sensitivity, nonconformity, fantasy and so on.

Empathy has also been mentioned as a psychological variable that might be relevant in second or foreign language acquisition. Guiora et al. (1975, p. 48) suggest that empathy is essential to success in the second language learning: 'To speak a second language authentically is to take on a new identity. As with empathy, it is to step into a new and perhaps unfamiliar pair of shoes'.

Second language learners with high levels of empathy have been found to be better at imitating a native speaker's pronunciation (Guiora, Beit-Hallahmi, Brannon, Dull, & Scovel, 1972; Guiora, Brannon, & Dull, 1972). Guiora (1990) claims that pronunciation ability and empathy are influenced by the permeability of ego boundaries, constituting the so-called 'language ego'. Permeability (or mental flexibility) refers to the ease with which new experiences, cultural features or perceptions of other people may pass the defences of one's personality. People with low levels of ego permeability are more defensive and less receptive to outside influences. Higher levels of ego permeability imply lower defensiveness and higher receptivity. Guiora claimed that children learn their L1 in a state of ego permeability, but that this permeability decreases progressively with age. According to Guiora and coworkers (1972) ego permeability strengthens individuals' sensitivity to social interaction and allows individuals to pick up subtle speech nuances and to learn to reproduce them. Some research has been carried out to see whether ego boundaries, that is, subjective inhibitions, can be weakened through consumption of alcohol or Valium (Guiora, Acton, Erard, & Strickland, 1980; Guiora, Beit-Hallahmi, et al., 1972). Baran-Lucarz (2012) investigated the link between types of ego boundaries and accuracy in L2 pronunciation. She found few relationships but a weak positive correlation emerged between pronunciation scores and a boundary representing "the subjects' attitudes towards accepting objects, concepts and situations that lack clear borders" (p. 60).

Rota and Reiterer (2009) have investigated the link between empathy and pronunciation (using the Modern Language Aptitude Test [MLAT]). The authors used a scale developed by Leibetseder, Laireiter, Riepler, and Köller (2001). Empathy was defined 'as the effort to identify with persons in fictitious or real-life situations' (Rota & Reiterer, 2009, p. 71). The questionnaire consists of 26 items grouped into four factors: 'cognitive-sensitivity, emotional sensitivity, emotional and cognitive concern' (p. 71). Empathic readiness scores were found to correlate positively and significantly with talent of pronunciation, phonetic coding ability, grammatical sensitivity and vocabulary learning (p. 72). Further research by these researchers, using fMRI imaging, has shown that imitation aptitude for an unknown language (Hindi) is mostly predicted by working memory, whereas imitation aptitude in advanced L2 is best predicted by empathy and phonetic coding ability (Reiterer, 2011). Empathy was also found to predict L2 pronunciation aptitude among advanced learners of English L2 (Hu et al., 2012).

Ożańska-Ponikwia and Dewaele (2012) found that self-perceived English L2 proficiency scores of Polish immigrants in Ireland and the UK correlated positively, and significantly, with three personality traits: Agreeableness, Openness and Empathy (but not Extraversion). The authors speculate that curiosity in the L2 and an ability to perceive an interlocutor's point of view have a stronger effect on self-perceived proficiency than gregariousness and talkativeness – facets of Extraversion.

Research questions and hypotheses

The present study will address the following questions:

- (1) Is the knowledge of more languages linked to higher levels of empathy? We expect participants knowing more languages to score higher on empathy.
- (2) Is the degree of multilingualism linked to higher levels of empathy? We expect participants having advanced knowledge of languages and using them frequently to score higher on empathy.
- (3) Does growing up bilingually affect empathy? We hypothesise that participants who grew up bi- or trilingually will score higher on empathy.
- (4) Does living abroad affect empathy? If that is the case, do those who have stayed abroad longer score higher on empathy? Our expectation is that participants who have lived outside their homeland for some time will score higher on empathy.
- (5) Is there an effect of age, gender and education level on empathy? We expect that older, female and more highly educated participants will score higher on empathy.

Method***Participants***

A total of 2158 multilinguals (1589 females, 457 males) filled out the questionnaire. The participants reported 204 different nationalities, including many participants with double nationalities. The largest group came from the USA ($n = 478$), followed by British ($n = 299$), Dutch ($n = 145$), Belgian ($n = 81$), German ($n = 81$), Canadian ($n = 76$), Polish ($n = 65$), French ($n = 58$), Spanish ($n = 42$), Chinese ($n = 41$), Croatian ($n = 41$), Turkish ($n = 35$), Swiss ($n = 34$), Portuguese ($n = 33$), Swedish ($n = 28$), Italian ($n = 28$), Japanese ($n = 27$) and so on.² English was the most frequent L1 ($n = 866$), followed by Dutch ($n = 195$), French ($n = 155$), Spanish ($n = 138$), German ($n = 124$), Polish ($n = 71$), Chinese ($n = 63$), Portuguese ($n = 52$), Arabic ($n = 41$), Croatian ($n = 40$), Russian ($n = 40$), Turkish ($n = 36$), Italian ($n = 32$), Japanese ($n = 27$), Swedish ($n = 26$), Greek ($n = 23$), Farsi ($n = 22$), Hebrew ($n = 21$), Korean ($n = 21$), Romanian ($n = 16$), Hungarian ($n = 14$), Norwegian ($n = 14$), etc. The most frequent L2 was English ($n = 924$) followed by French ($n = 455$), Spanish ($n = 248$), German ($n = 143$), etc. The pattern was different for the L3 with French coming first ($n = 424$), followed by German ($n = 330$), English ($n = 248$) and Spanish ($n = 222$). The most frequent L4s were German ($n = 205$), Spanish ($n = 196$), French ($n = 174$) and English ($n = 44$). The most frequent L5 was Spanish ($n = 101$), Italian ($n = 69$), French ($n = 50$), and German ($n = 49$). Mean age of acquisition of the L2 was 10.1 years ($SD = 5.4$), this increased to 15 years for the L3 ($SD = 6.4$), 18.3 years for the L4 ($SD = 7.8$) and 21.7 for the L5 ($SD = 8.6$).

The sample consists of 41 monolinguals, 399 bilinguals, 566 trilinguals, 557 quadrilinguals, 359 pentalinguals, 143 sextalinguals, 54 septalinguals, 21 octalinguals, 9 participants reported knowing 9 languages, 5 participants knew 10 languages, and 1 participant knew 12 languages. A single category was created including all participants with six or more languages. A majority ($n = 1866$) reported having one single L1, a small proportion reported growing up with two L1s ($n = 274$) and

18 participants grew up with three languages from birth (the latter two groups were aggregated).

The mean age was 34.5 years ($SD = 12.1$). Participants are generally highly educated with 31 having a high school diploma, 606 a Bachelor's degree, 712 a Master's degree and 613 a Doctoral degree.

This sample of highly educated, mostly female polyglots, is quite typical for online questionnaires dealing with language issues (Wilson & Dewaele, 2010). The main advantage of online questionnaires is the ability to collect data from all around the world, eliminating 'local' effects such as a dislike for a particular language and its speakers, and it allows the recruitment of participants from a wide age range (Wilson & Dewaele, 2010).

Instruments

We used an adapted version of Baron-Cohen and Wheelwright's (2004) questionnaire to measure the Empathy Quotient. The authors describe their instrument as being 'short, easy to use, and easy to score' (p. 166).

Lawrence et al. (2004, p. 912) explain that the EQ was 'explicitly designed to have a clinical application and be sensitive to a lack of empathy as a feature of psychopathology'. It was validated on healthy control volunteers and a smaller number of people with Asperger's Syndrome and High-functioning Autism (p. 912). The questionnaire has 60 items (20 of which were filler items) with Likert scale responses (Baron-Cohen and Wheelwright 2004, p. 166). The authors performed exploratory factor analysis in order to explore the various components of empathy. Three factors emerged from the analysis, explaining 41% of the variance:

- (1) Cognitive Empathy: 'measures the appreciation of affective states' (Lawrence et al., 2004, p. 918);
- (2) Emotional Reactivity: 'reflects the tendency to have an emotional reaction in response to others' mental states' (p. 918);
- (3) Social Skills: 'the spontaneous use of such skills and/or a lack of intuitive social understanding' (p. 918).

Women scored slightly but significantly higher on EQ than men in the normal control group (Baron-Cohen & Wheelwright, 2004, p. 170).

Because of length restrictions in our online questionnaire, we selected five items per dimension and ignored the filler items. We choose the items with the highest factor loadings in Lawrence et al. (2004, p. 915) (see Appendix).

Our open-access questionnaire remained online on SurveyMonkey between December 2010 and March 2011, and attracted 2158 valid responses from multilinguals across the world. It was advertised through several LISTSERVs, targeted emails to multilingual colleagues and their students in academic institutions, and informal contacts around the world. Participants started by filling out a short sociobiographical questionnaire. It contained questions about sex, age, nationality, language history and present language use.

We used participants' information on frequency of use of their various languages and self-perceived competence in speaking and writing these languages to develop two measures of multilingualism, first presented in Dewaele and Stavans (2012). Cook (2002, p. 7) argues that 'Acquiring another language alters the L2 user's mind

in ways that go beyond the actual knowledge of language itself', we wonder whether a high level of proficiency or a high frequency of use of foreign languages, or both, lead to multicompetence.

We thus developed a first multilingualism index based on language knowledge, or a 'total proficiency score', which is the sum of self-perceived competence scores collected on 5-point Likert scales in up to six languages. Such a measure is potentially useful to distinguish self-professed pentalinguals with minimal competence in three languages from trilinguals with maximal proficiency in three languages. The latter might know fewer languages, but knowing them to higher level undoubtedly makes the individual more strongly multilingual. In other words, rather than sticking to the imprecise labels 'bilingual, trilingual, quadrilingual, etc', considering every language as a discrete entity, despite the fact that competence can be near zero, we consider the multilingual users' accumulated language knowledge across languages. The total proficiency score is the sum of the proficiency scores on 5-point Likert scales for oral proficiency (maximum score 5) and written proficiency (maximum score 5) for up to six languages (including two L1s) (maximal possible score $10 \times 6 = 60$). In the present sample, total proficiency scores varied between 5 and 55 with a mean of 25.5 ($SD = 8.0$).

The same principle was applied for language use. Multilinguals who rarely use their foreign languages can be distinguished from those who use them more frequently. This is a measure of intercultural communicative activity. The total language use score is the sum of frequency of use scores on 5-point Likert scales for up to six languages (maximal possible score $5 \times 6 = 30$). In the present study, total frequency of language use scores varied between 3 and 30 with a mean of 11.2 ($SD = 3.8$).

A scale analysis revealed that our 15-item Empathy Quotient had insufficient internal consistency (Cronbach's $\alpha = 0.38$). Separate analyses of the three subscales showed that cognitive empathy was internally consistent (Cronbach's $\alpha = 0.84$), but that Emotional Reactivity and Social skills were unacceptably low, with Cronbach's alpha of 0.16 and 0.22, respectively. We therefore decided to limit our analysis to cognitive empathy. Scores of the 1936 participants who filled out all five items of this subscale varied between 5 and 25, with a mean of 18.5 ($SD = 3.5$). A one-sample Kolmogorov Smirnov test showed that the values for cognitive empathy are normally distributed, allowing the use of parametric statistics.

Results

Knowledge of multiple languages

An ANOVA showed no significant effect of knowledge of multiple languages on cognitive empathy ($F = 0.9$, $p = ns$). The expected trend was present, with monolinguals having the lowest mean score (mean = 18.0, $SD = 4.0$) and sextalinguals having the highest score (mean = 18.9, $SD = 3.7$), but a Tukey HSD post-hoc test showed that the difference between both groups was not significant.

Level of multilingualism

The two independent variables, total frequency scores and total proficiency use, are highly correlated with each other ($r(2136) = 0.762$, $p < 0.0001$). In other words, highly proficient language users are also frequent language users.

A Pearson correlation analysis revealed a small but significant positive correlation between total proficiency scores and cognitive empathy scores ($r(1934) = 0.068$, $p < 0.003$). A comparable relationship emerged between total frequency scores and cognitive empathy scores ($r(1922) = 0.072$, $p < 0.001$). These results suggest that higher levels of multilingualism, as measured through individuals' total proficiency and total frequency of language use, are linked with significantly higher levels of cognitive empathy. In order to visualise the findings, we assigned our participants to three groups (Low, Medium and High) for total proficiency and total frequency. Participants whose scores for total proficiency and total frequency fell within 1 SD above or below the mean were placed in the Medium group, those with scores that were 1 SD above the mean were placed in the High group, those with scores that were 1 SD below the mean were placed in the Low group (see Table 1).

An ANOVA revealed a significant effect of total frequency on cognitive empathy ($F(2, 1922) = 3.78$, $p < 0.023$). A Tukey HSD post-hoc test showed that the High group scored significantly higher on Cognitive Empathy than the Low group ($p < 0.019$). Although a roughly similar picture emerged for total proficiency, it failed to reach statistical significance ($F(2, 1934) = 1.58$, $p = 0.15$) (see Figure 1). A look at the patterns in Figure 1 shows a linear increase on cognitive empathy along the three groups of total frequency. In other words, the more frequently participants used their various languages, the higher their scores on cognitive empathy. The pattern differs for total proficiency where the scores on cognitive empathy are similar for the Low and the Medium group, and only increase for the High group.

Bi- or trilingual upbringing

An independent samples *t*-test revealed that the 263 participants who had been exposed to two or three languages simultaneously since birth did not score significantly higher on cognitive empathy (mean = 18.7, SD = 3.6) compared to the 1673 participants who had been brought up monolingually (mean = 18.5, SD = 3.7) ($t(1934) = 0.56$, $p = \text{ns}$).

Stay abroad

An independent samples *t*-test revealed that the 1378 participants who had lived abroad did not score significantly higher on cognitive empathy (mean = 18.6, SD = 3.7) than the 557 participants who had never lived abroad (mean = 18.3, SD = 3.5) ($t(1933) = 1.32$, $p = \text{ns}$).

Table 1. Distribution of participants according to scores on total frequency and total proficiency.

	Total frequency	Total proficiency
Low	168	251
Medium	1495	1424
High	259	259
Total	1922	1934

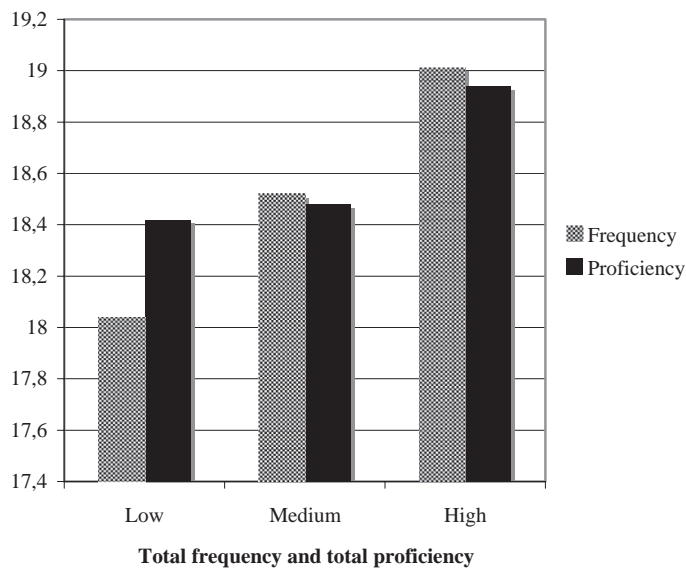


Figure 1. The relationship between total proficiency, total frequency and cognitive empathy.

Age, gender and education level

A Pearson correlation analysis showed no relationship between participants' age and their cognitive empathy scores ($r(2147) = 0.009, p = \text{ns}$).

An independent samples *t*-test showed that the 1448 female participants scored significantly higher on cognitive empathy (mean = 18.7, $SD = 3.6$) compared to the 388 male participants (mean = 18.0, $SD = 3.6$) ($t(1835) = -3.26, p < 0.001$).

An ANOVA showed that level of education was marginally linked to cognitive empathy scores ($F(3, 1929) = 2.31, p = 0.074$). Participants with university education tended to score higher on cognitive empathy (see Table 2).

Discussion

The results show that the number of languages known by participants and their linguistic histories are not related to levels of cognitive empathy. However, a positive relationship emerged between levels of multilingualism and cognitive empathy. This confirms earlier studies showing small but significant relationships between indices of multilingualism on the one hand, and personality traits on the other hand (Dewaele & Stavans, 2012; Dewaele & Wei, in press).

To sum up, our first hypothesis was rejected as participants knowing more languages did not score higher on cognitive empathy than those knowing fewer

Table 2. The effect of education level on cognitive empathy (ANOVA).

Education level	Cognitive empathy
High school	17.47
BA	18.41
MA	18.78
Ph.D.	18.44

languages. We did have enough evidence to confirm our more fine-grained second hypothesis: participants with higher levels of multilingualism scored significantly higher on cognitive empathy. A follow-up analysis showed that frequent use of multiple languages had a stronger effect on cognitive empathy than mere proficiency in multiple languages.

Our third and fourth hypotheses were rejected: participants who had been brought up bi- or trilingually did not score higher on cognitive empathy compared to those who grew up monolingually and a stay abroad was not linked to superior levels of cognitive empathy.

Our final hypothesis was partly confirmed as participants' gender was linked to cognitive empathy scores, with female participants scoring higher than male participants. Participants with higher levels of education also tended to score higher on cognitive empathy. Age was unrelated with scores on cognitive empathy.

These findings show that cognitive empathy is significantly linked to some aspects of individual's knowledge and frequency of use of various languages. The fact that a bi-/trilingual upbringing was not linked to higher levels of cognitive empathy suggests that the presence of two (or three) languages/cultures in the home environment is insufficient in itself to make somebody more cognitively empathic. Contrary to our findings for TA (Dewaele & Wei, in press), which was boosted by sudden massive exposure to unfamiliar languages and cultures, the stay abroad did not seem linked to increased levels of cognitive empathy. The most interesting finding is that higher levels of active multilingualism are linked with higher scores on cognitive empathy. A similar pattern was found in Korzilius et al. (2011) who reported a significant positive correlation between self-assessed knowledge of foreign languages and Cultural Empathy (p. 546). It shows that average proficiency in several languages is unlikely to change the mind (and the personality) of the L2 learner/user much and while higher levels of proficiency seem to correspond with higher levels of cognitive empathy, the effect is less progressive than for total frequency of use of languages. Indeed, multilinguals who use all their languages frequently score significantly higher on cognitive empathy. One could argue that these multilinguals have become truly 'multicompetent' (Cook, 1992). It is tempting to see a causal relationship between multilingualism and increased cognitive empathy. However, the reverse relationship is equally possible, namely that individuals with higher levels of cognitive empathy develop a keener interest to acquire and use foreign languages, and are therefore more likely to attain higher levels of multilingualism. Such a relationship was reported in the literature, with international exchange students scoring higher on Openmindedness, Social Initiative, Flexibility and Emotional Stability compared to a control group in the home institution, before departure (Leong, 2007).

Our study has a number of obvious limitations. The main issue is the difficulty of measuring empathy. The instrument we developed based on the EQ (Baron-Cohen & Wheelwright, 2004) was less reliable overall than we had expected. The low levels of internal consistency of the whole Empathy scale, and two subscales, Emotional Reactivity and Social Skills, meant that we could only use a single subscale with a strong internal consistency, namely cognitive empathy. It is striking that the five items in the latter scale were all positively worded (see Appendix), while three out of five items in the Emotional Reactivity and four out of five items in the Social Skills scales were negatively worded. Is it possible that too many of our respondents suffered from fatigue in filling out a relatively long questionnaire

(50 questions) and that too many struggled with the double negatives? This was unfortunate as one might expect multilingual individuals to have developed stronger intercultural social skills, and we expected them to score higher on this particular scale. That said, we have pointed out in Wilson and Dewaele (2010) that online instruments of this length (about 20 minutes to fill out) yield solid results.

Our operationalisation of multilingualism is a crude one. It is inevitably a relatively simplistic way of measuring a multilayered and complex phenomenon. We would argue however, that a crude measure is better than the mere sum of languages (bilingual, trilingual and so on), and we hope this may be an impetus for the development of more sophisticated measures.

We also aware that our self-selected sample does not necessarily reflect the 'general population' because of the high proportion of women, highly educated participants and the obvious need to be connected to Internet. It has been argued that this is not necessarily a weakness since filling out this type of questionnaire requires a relatively high level of metalinguistic and metacognitive awareness (Wilson & Dewaele, 2010). While this unbalance does not invalidate the findings, it needs to be kept in mind when interpreting the results.

We feel that our study also had a number of strengths. The large sample from monolinguals and multilinguals, including polyglots, from all over the world ensured a good level of ecological validity (Wilson & Dewaele, 2010). The wide age range also means that the sample included not just foreign language learners but also experienced foreign language users.

Conclusion

A growing number of studies have shown that the effect multilingualism extends beyond the cognitive level and affects more than just executive control (Barac & Bialystok, 2011). Indeed, multilingualism has been linked to creative behaviour and divergent thinking (Kharkhurin, 2008, 2010). Recent research also suggests that a relationship exists between multilingualism and personality profiles, with frequent and proficient users of several languages typically scoring higher on Openness/Openmindedness (Dewaele & Stavans, 2012; Dewaele & Van Oudenhoven, 2009; Korzilius et al., 2011), on TA (Dewaele & Wei, in press) and suffering less from FLA (Dewaele, 2010a, 2010b).

Most research in the field of foreign language and multilingualism has used empathy as a predictor variable (Guiora, Brannon, et al., 1972; Hu et al., 2012; Ozanska-Ponikwia & Dewaele, 2012; Reiterer, 2011; Rota & Reiterer, 2009). One previous study that looked at personality traits as dependent variables and included multilingualism as an independent variable found that high levels of multilingualism corresponded with higher levels of Cultural Empathy, Openmindedness and Social Initiative (Dewaele & Stavans, 2012).

The findings of the present study are congruent: multilingual participants (especially those using multiple languages frequently) score higher on cognitive empathy, which means that they will tend to be more skilful in conversations as they can see the world from their interlocutor's point of view. One could therefore conclude that these participants have indeed become multicompetent (Cook, 2002).

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Notes

1. We are obviously aware of the recent surge of research on the linguistic effects of multilingualism in additional language learning and usage (De Angelis, 2007; De Angelis & Dewaele, 2011), but this lies outside the scope of the present paper.
2. To avoid taking up too much space, we will only report the largest groups.

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Appendix

Cognitive Empathy

- (1) I can tell if someone is masking their true emotion.
- (2) I can tune into how someone else feels rapidly and intuitively.
- (3) I am good at predicting how someone will feel.
- (4) I can easily work out what another person might want to talk about.
- (5) I can sense if I am intruding, even if the other person doesn't tell me.

Emotional Reactivity

- (6) Seeing people cry doesn't really upset me => reverse
- (7) I tend to get emotionally involved with a friend's problems.
- (8) I get upset if I see people suffering on news programmes.
- (9) It is hard for me to see why some things upset people so much => reverse
- (10) Other people often say that I am insensitive, though I don't always see why => reverse

Social Skills

- (11) I find it hard to know what to do in a social situation. => reverse
- (12) I don't tend to find social situations confusing.
- (13) Friendships and relationships are just too difficult, so I tend not to bother with them
=> reverse
- (14) I often find it difficult to judge if something is rude or polite => reverse
- (15) I find it difficult to explain to others things that I understand easily, when they don't understand it first time => reverse

Source: Baron-Cohen and Wheelwright (2004).