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A bilingual emotional advantage? An investigation into the effects of psychological factors in emotion perception in Arabic and in English of Arabic-English bilinguals and Arabic /English monolinguals¹

Abstract

Aims and objectives: While the debate on the cognitive bilingual advantage is ongoing, much less attention has been paid to a potential emotional advantage of bilinguals. The present study compared the performance of bilinguals and monolinguals in emotion perception (EP) in Arabic and in English and the differences in trait emotional intelligence (Trait EI). It also considered the relationship between Trait EI and EP scores.

Methodology: 205 Arabic-English bilinguals, 71 Arabic monolinguals and 333 English monolinguals had to recognise *anger, fear, sadness, disgust, surprise* and *happiness* in twelve short audio-visual video clips (six in English and six in Arabic) embedded in an online questionnaire. The clips contained short conversations about day-to-day situations.

Data and analysis: Nonparametric statistical analyses were used to explore the differences between bilinguals and monolinguals in EP in English and Arabic and to explore the relationship between Trait EI and EP.

Findings: Bilinguals outperformed English monolinguals in the EP task in English but did not perform better than Arabic monolinguals in Arabic. Bilinguals scored higher on Trait EI than monolinguals, and Trait EI scores were significantly and positively correlated with EP scores.

Originality: This study suggests that there is a small bilingual advantage for emotional and psychological domains.

Significance: Bilingualism seems to have an effect on some personality dimensions and emotional skills.

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Keywords:

Bilingualism, emotion perception; trait emotional intelligence; monolinguals and bilinguals
bilingual advantage.

Introduction

Emotions vary from culture to culture and from one speech community to another. This variation in emotions is predicted by the flexible nature of emotion experiences and concepts in different linguistic contexts. Emotion perception, according to Barrett (2017), is defined as the ability of individuals to infer the emotional states of others, based on their previous emotional experiences and predictions that are constructed by emotion concepts available in their languages, through certain emotional channels, either verbal, non-verbal cues or a combination of both. Emotion concepts acquired through learning a language are essentially associated with emotions words and expressions (Barrett, 2017), which might not exist in other languages (Pavlenko, 2008). Accordingly, individuals speaking more than one language are more likely to possess a greater number of emotion concepts across their languages, an indicator of well-being and emotional intelligence (Barrett, 2017). It is therefore not unreasonable to expect that bilinguals' richer and more diverse range of emotion concepts can constitute a bilingual advantage (BA).

In his overview of research on the BA, de Bot (2017) lists the cognitive skills where researchers have claimed that bilinguals outperform monolinguals. These include creative, logical and flexible thinking, metalinguistic awareness and additional language learning. He suggests that future research could focus on other advantages using different tasks and different populations. More specifically, he suggests that research on the BA could go beyond executive functioning, focusing on other areas.

The present study proposes to do exactly that, delve into the specifics of emotion perception of Arabic-English bilinguals watching video recordings of emotions acted out in Arabic and in English. It is then essential to compare bilinguals' emotion perception to that of monolinguals in both languages, not to look for a deficit in bilinguals' abilities to interpret emotions but instead to understand how their perception differ from that of monolinguals and to pinpoint the precise effects of bilingualism on emotional and communicative skills. A second component is the facilitative role of trait emotional intelligence in emotion perception.

We will start with a literature review on the BA in cognitive and socio-emotional skills but also in personality before focusing on previous research on emotion perception, which

has been very much focused on monolinguals. This will be followed by the research questions. Next, we will present the methodology. The results section will include the statistical analyses which will be discussed in the following section and, finally, some tentative conclusions will be presented.

Literature review

The Bilingual Advantage (BA) in cognitive functioning and socio-emotional skills

Using two languages is an exercise through which the brain develops different cognitive (de Bot, 2017) and socio-emotional skills (Han, 2010) beyond the linguistic domain. The BA defined in lay terms refers to the “skills areas in which bilinguals outperform monolinguals (de Bot, 2017, p. 15). A pioneer in this area is Ellen Bialystok who attributed the BA to the plasticity of bilinguals’ cognitive systems which is the consequence of using and switching between the L1 and L2 (Bialystok, 2011). It also can be attributed to the bilinguals’ consistent need to monitor and manage the use of their two languages (Prior & MacWhinney, 2010). A recent meta-analysis of 152 studies and 891 comparisons of bilinguals’ and monolinguals’ performance in six executive functioning domains by Lehtonen, Soveri, Laine, Järvenpää, de Bruin and Antfolk (2018) confirmed de Bot’s (2017) observation that the existence of the BA is in doubt. The authors concluded that their analysis does not provide strong evidence for the benefits of bilingualism in cognitive control functions in adulthood due to the very small effect sizes observed in studies on inhibitory control, shifting, and WM disappeared, specifically when reducing publication bias (Lehtonen et al., 2018). Cape, Vega-Mendoza, Bak and Sorace (to appear) suggested that one of the reasons for the small effect sizes in measures of executive control is that other factors play a role such as context of bilingualism experience. Based on their analysis of executive functions of primary school pupils in Gaelic Medium Education and English Medium Education in Scotland, the authors suggest that bilinguals who do not switch much between their languages may not experience a cognitive effect.

experiencing a low level of language switching may not show EF effects

Bilingualism might be linked to increased socio-emotional skills (e.g. approach-to-learning, self-control, interpersonal, internalizing, and externalizing) of children in their early school years (Han, 2010). In a longitudinal study on Latino children from kindergarten to fifth grade, Han (2010) found that by fifth grade, fluent bilingual children surpassed

monolinguals in the socio-emotional skills as they could easily communicate with their teachers, peers and parents. The fluent bilingual children recorded the highest levels of approaches-to-learning, self-control, and interpersonal skills. The author speculated that children's fluent use of two languages helps them to feel more comfortable and accepted in their schools, which developed their socio-emotional well-being. Other benefits of bilingualism included increased fluency and more exposure to an L2 (including more extensive vocabulary skills) (Genesee, 2008).

The effect of bi- and multilingualism on personality

Bilingualism and multilingualism have been found to have a significant but small effect on higher order and lower order personality traits. Knowing more languages, and particularly knowing more languages well and using them frequently has been linked to higher levels of Openmindedness, Cultural Empathy (Dewaele & Stavans, 2014), Cognitive Empathy (Dewaele & Li Wei, 2012), Tolerance of Ambiguity (Dewaele & Li Wei, 2013). Multilinguals have also been found to suffer less from communicative anxiety across their languages (e.g. Dewaele, Petrides & Furnham, 2008; Dewaele, 2013), possibly because their multilingualism has made them better and more confident communicators. However, Dewaele (2018c), in a study on the relationship between multilingualism and emotional among 1278 participants, found that individuals knowing more languages, and knowing them to a higher level, did not –generally- score significantly higher on trait Emotional Intelligence.

Emotion perception

Barrett (2017) argued that emotions are not universal entities but instead are mere instances that people construct based on their past emotional experiences and their predictions created in their brains. The predictions emerge from the emotional information stored previously in the brain (e.g. the meaning of physical movements and facial expressions) that link physical sensations and feelings to what is going on in the surrounded world. The way people perceive emotions in others are deeply affected by their predictions. The brain predicts the type of emotion displayed by facial expressions based on past experiences and based on similar situations. People, hence, interpret others' emotions based on the emotions exist in their brain (Barrett, 2017). Emotion perception is thus referred to as “a complex mental process that does not imply a neural fingerprint behind the emotion, merely that an instance of emotion occurred somehow” (Barrett, 2017, p. 40). People, therefore, are the “architects” of their

emotional experiences and perception (Barrett, 2017, p. 42). In other words, people have control over their emotions and are responsible for them. This view of emotions acknowledges the important role of culture and language in emotion formation.

Numerous studies have attempted to explain the role of culture (e.g. Dewaele, 2015; Markus & Kitayama, 1991) and language (e.g. Pavlenko, 2005; Wierzbicka, 1999) in emotion. People from different cultures have been found to pay attention to various types of emotional cues. For example, de Gelder and Veld (2016) found that Americans tend to interpret emotions through facial expressions while Japanese rely more on vocal cues to interpret emotions. The significant role of language in emotion construction emerges from the distinctive sets of emotion words and concepts available in every language (Pavlenko, 2005, 2008, 2014). Each emotion word has a conceptual representation (i.e. an emotion concept) stored in the brain. This emotion concept is associated with a set of emotional patterns (e.g. facial expressions, hand movements and other physical behaviors). Members of a speech community share the same emotion concepts that are linked to the emotion words available in that language. If some emotion words do not exist in a language, people speaking that language might be unable to perceive or express those emotions (Pavlenko, 2008, 2014). Some languages, therefore, lack the exact translation equivalent of certain emotion words (conceptual non-equivalence).

Barrett (2017) has suggested that people belonging to the same culture use “synchronized concepts” (p. 94), which allow them to communicate their emotions effectively. The process of acquiring emotional conceptual knowledge continues to develop throughout life by **learning new emotion words and constructing new emotional predictions** and experiences. Following Barrett’s suggestion, it can be assumed that bilinguals and multilinguals have the opportunity to develop their emotional knowledge and construct new emotion concepts which might not exist in their L1 when acquiring a new language (LX). Through exposure to LXs languages and cultures, they might be able to distinguish the variations in the verbal and non-verbal emotional expressions in L1 and the LXs.

Emotion perception and bilingualism

Research on bilinguals’ and multilinguals’ language preferences for the expression of emotion has suggested that the L1 is typically preferred (Dewaele, 2013; Pavlenko, 2005, 2012). Multilinguals thus have access to a wide variety of predictions that allow them to interpret and express emotions in different languages and contexts. They typically have a chameleon-like ability to frame switch, i.e. to shift their emotion patterns based on the

language they speak to fit the linguistic and cultural situations (Panayiotou, 2004). This ability might be attributed to emotional granularity (i.e. a rich repertoire of emotion words and concepts) (Barrett, 2017). This emotional granularity allows people to have a variety of ways to express and to describe not only their own but also other people's emotions. Accordingly, it can be assumed that bilinguals' knowledge of two languages might give them an advantage in the communication of emotions.

Cultural distance between languages and cultures increases the difficulty in communicating emotions accurately (Dewaele, 2015, 2018b). In an early study, Rintell (1984) found that English L1 users performed significantly better than Spanish, Arabic, and Chinese learners of English in the recognition of emotions through audio recordings of conversations by English L1 actors. Chinese students had the lowest scores, followed by the Arab students and then the Spanish students.

In another study, Dromey, Silveira and Sandor (2005) found that 32 **multilingual** Canadian English L1 users performed marginally better than the 57 LX users¹ in the detection of affective prosody (neutral or angry) at the word level in audio recorded conversations. However, a group of 53 **monolingual** English L1 users performed similarly to LX users. The researchers conclude that individuals who grew up with the L1 of the speaker have an advantage in recognizing vocal affect (p. 356), and that the multilinguals using an LX are more likely to acquire the LX prosody and thus are able to distinguish the linguistic difference in their multiple languages. They also suggest an alternative explanation, namely that the multilinguals had an "inherent ability to identify emotional signals of speech, which may have contributed to their capacity and willingness to master a second language" (p. 357). The authors do not exclude the potential confound of education in their findings, as the multilinguals were more highly educated. Age of onset may also have played a role, as the English LX users had acquired their English early in their childhood, which may explain their ability to easily identify the prosodic features of English recordings.

Lorette and Dewaele (2015) conducted a study to explore the differences in emotion recognition of 356 English L1 users and 564 LX users of English. The participants were asked to choose an emotion word from a list that best matched the emotion portrayed in audio-visual videos acted by a British English-speaking actress. Their findings indicated that L1 and LX users of English did not differ significantly in their ERA scores. However, L1 culture was found to have a significant effect on the ERA scores, with Asian participants having lower scores than the other groups. A follow-up study using the same corpus, to which the data of 449 participants had been added who had completed the audio-only version of the

stimuli, revealed that L1 users outperformed LX users in the audio-only version, which suggest that LX users need visual cues about emotion in order to reach L1-like ERA (Lorette & Dewaele, to appear a). Participants with higher linguistic proficiency scores had significantly higher ERA scores, particularly in the audio-only condition. Asian LX users had significantly lower ERA scores than other LX users (Lorette & Dewaele, to appear a). A final study on the data from all 1220 participants (Lorette & Dewaele, to appear b) revealed that participants who grew up with two languages from birth had an advantage in English ERA but only if their early languages did not include English.

Dewaele, Lorette and Petrides (to appear) explored the individual differences in ERA of 150 British and 151 American English L1 users. The emotions included in the study were anger, fear, disgust, sadness, surprise and happiness, which were portrayed in audio-visual videos clips by a British L1 English-speaking actress. No significant differences emerged in ERA scores between the British and American English L1 users, but higher levels of linguistic proficiency and higher levels of Trait EI were linked to significantly higher ERA scores. A significant interaction was also found between both independent variables: participants with lower levels of linguistic proficiency relied more on their Trait EI to interpret emotions while more proficient participants did not have to rely on their Trait EI to the same extent.

Among personality traits, emotional intelligence seems to be the most important psychological trait related to emotional perception. As Barrett (2017) suggested, individuals with high levels of emotional intelligence have learned more emotion words and constructed new emotional experiences and predictions. In the same way, bilinguals, having acquired a larger set of emotion words and concepts, could be assumed to possess greater emotional granularity and a better ability to interpret the emotions of others, an indicator of emotional intelligence and well-being.

Emotion perception and trait emotional intelligence

Emotional intelligence, according to the theory of constructed emotions, is the ability to construct more emotional instances from emotion concepts previously stored in the brain, which fit each given emotional situation (Barrett, 2017). It can be noted, from this definition, that emotional intelligence is described in relation to emotion concepts and the ability to know how and when to use them. In other words, emotionally intelligent people acquire more emotion words as they seed emotion concepts which are the basis for constructing new emotional experiences and predictions (Barrett, 2017).

People, therefore, can be emotionally expert when developing their emotional granularity as they can express their emotions and perceive emotion variations in others (Barrett, 2017). For example, a person who had only two emotion concepts “Feeling Awesome” and “Feeling Crappy” to describe different affective states “cannot be very emotionally intelligent” (p. 180), but people with rich emotion words to distinguish emotion instances of feeling awesome like “happy, content, thrilled, relaxed, joyful, hopeful, inspired, prideful, adoring, grateful, blissful...”) are more likely to be emotionally intelligent (Barrett, 2017, p. 180). In other words, their brains are more likely to be prepared to construct more emotion concepts that allow them to match each emotion word with the suitable emotional situation. Therefore, they can experience, predict, categorize, and perceive emotions “more efficiently” (p. 180).

We adopt the perspective that emotional intelligence is a personality trait (Petrides & Furnham, 2003). It is measured through self-report questionnaires, whose scores may lead to predictions about emotional knowledge and personality, such as TEIQue (Trait Emotional Intelligence Questionnaire, Petrides & Furnham, 2003).

Several studies thus far have linked EI with emotion recognition ability (Austin, 2004; Ciarrochi et al., 2001; Dewaele et al., in press; Petrides & Furnham, 2003). Overall, most of these studies have found that those participants with high Trait EI levels were better at recognizing emotions. In Dewaele et al. (in press), Trait EI had a positive effect on the emotion recognition ability of British and Americans English L1 users².

In sum, these studies suggest that linguistic, cultural, and psychological factors interact in the emotion perception of bilinguals. Having adopted the theory of constructed emotions, it is assumed that individuals are able to construct emotions as long as they learn a new language and that ability is not universal. While extensive research has been done on emotion expression and perception of monolinguals using one or two emotional channels (i.e. audio, visual or verbal cues of emotional expressions), it remains unclear to what extent familiarity with two languages impacts emotion perception of bilingual individuals. To fill this gap, it is essential to investigate the emotion perception of bilinguals in their both languages using multimodal stimuli (i.e. spontaneous and dynamic stimuli) as this type of stimuli can provide rich emotional information and have stronger ecological validity (Elfenbein & Ambady, 2002). While previous studies on the emotion recognition ability (ERA) of multilinguals lack comparisons of multilinguals’ ERA scores with monolinguals, this study will compare bilinguals’ EP scores with those of monolingual peers watching the stimuli in their L1 and in an unknown language.

Research questions

The following research questions have been formulated:

1. Do Arabic-English bilinguals outperform Arabic and English monolinguals in emotion perception (EP) in Arabic and English?
2. Do Arabic-English bilinguals score higher on Trait EI than Arabic and English monolinguals?
3. Is there a link between trait Emotional Intelligence and EP scores of Arabic-English bilinguals and Arabic and English monolinguals?

Method

Participants

Six hundred and nine participants (41% males and 59% females) participated in this study. Their age varied between 17 and 65 years old ($M = 35.33$, $SD = 11.15$). They were divided into three groups on the basis of their language profile. A first group consisted of 205 Arabic-English bilinguals (67 males; 138 females), the second one consisted of 333 English monolinguals (157 males; 176 females), and the third consisted of 71 Arabic monolinguals (26 males; 45 females).

The Saudi Arabic-English bilinguals had Arabic as an L1 and learned English as an L2. The education levels varied with a majority having an undergraduate degree (42%), a master's (33%), a PhD (18%) and high school (6%). Of those bilinguals, 22% learned English through classroom instruction while 47% acquired English through both naturalistic and formal instruction. The mean linguistic proficiency score was 63.7 ($SD = 13.4$), which could be described as medium English proficiency levels. Of those L2 users, 108 participants had experienced L2 culture through social contacts with English L1 users in ESCs and were in ESCs at the time of the study. Their stay in an ECS varied from less than a year to 17 years ($M = 3.78$, $SD = 3.13$). Statistical analyses revealed that none of these independent variables were linked to EP scores in both languages.

The English-speaking monolinguals came from the United Kingdom: $n = 152$, America: $n = 54$, Australia: $n = 25$, and Canada: $n = 102$. The average age was 40.3 years ($SD = 11.1$). A third of participants had a high-school degree, 44% had an undergraduate degree, 13% had a Master, and 3% had a PhD³. All of them reported not knowing any other language but English. The mean score on the LEXTALE test (see next section), which was

used to determine their language proficiency level was 86.1 (SD = 16.4) with a maximum possible score of 100. A Mann-Whitney test revealed a significant statistical difference in the linguistic proficiency scores between Arabic-English bilinguals and English monolinguals: $U = 10893$, $z = -13.1$, $p < .0001$, with English monolinguals ($Mdn = 93.75$) outperforming Arabic-English bilinguals ($Mdn = 61.25$).

The third group consisted of Saudi Arabic monolinguals who reported not knowing any other language but Arabic. They had not been to any ESC at the time of participation in this study. The average age was 29.3 years ($SD = 9.3$). The education levels of the participants in this group varied between high school 25.5 %, 62% undergraduate, 5.6% a Master, and 2.8% a PhD.

Materials

The questionnaire consisted of three parts. The first part comprised general questions about the background information, including age, gender, education level, ethnic group, L1, L2, context and age of English acquisition/learning, frequency of English use, language proficiency (LEXTALE test - Lemhöfer & Broersma, 2012), and length of stay in ESCs⁴. The two other parts of the questionnaire are described below.

Trait Emotional Intelligence Questionnaire–Short Form (TEIQue-SF)

This questionnaire consisted of 30 items with 7-point Likert scale ranging from 1 (completely disagree) to 7 (completely agree) (Petrides & Furnham, 2003). It allows the calculation of a global Trait EI score. The reliability of the TEIQue-SF was high: Cronbach's alpha = .89.

Emotion Perception Task (EPT)

The EPT was designed with the express intention to have valid stimuli and to have control over their content. It consisted of 12 short audio-visual videos (6 videos in Arabic and 6 videos in English) depicting instances of four negative emotions (anger, fear, sadness, and disgust) and two positive emotions (pleased surprise and happiness). The videos were constructed for the purpose of this study and corresponded to day-to-day conversations. Each video contained a very short conversation (between 20 and 50 seconds), where one speaker was telling his/her friend about a past experience that caused him/her to experience one of the six emotions (see Appendix A).

The conversations in the English videos happened between a professional actor and a actress. Both of them are monolingual L1 users of English, born in the UK and have a British Received Pronunciation (RP) accent. The actress acted the videos that involved emotional

instances of the emotions categories *fear* and *happiness* while the actor acted the other emotional instances⁵. For the Arabic videos, four actors (i.e. two in each video) acted the scenarios out; two of them are professional actors and are monolinguals L1 users of Arabic. They speak the Arabic language with slight *Najdi* accent, which is the most popular accent in Saudi Arabia and is used widely in the capital city and in most cities in the centre and the east. They were born and brought up in Saudi Arabia. They work in *Basmat Ata'a Company*, which is a film-making company in Saudi Arabia. They acted two of the six Arabic videos out (the scenarios of the emotions *fear* and *sadness*). The other two actors (aged 33 and 37 years old) were also Arabic L1 users, but they can speak English as an L2. They were born in Saudi Arabia and were in the UK at the time of recording the videos. They are also professional actors, and they acted out four of the six Arabic videos, which included the scenarios of the emotions: *anger*, *disgust*, *surprise* and *happiness*.

The actors and the actress were instructed to imagine themselves in an emotional state including an instance of an emotion category (*anger*, *fear*, *sadness*, *disgust*, *happiness* or *surprise*). In the majority of the videos, they talked about real past emotional experiences. Thus, the actors were free to act the scenario out as they preferred to ensure that the stimuli were rich and ecologically valid. The actors were directed not to use direct emotion words (e.g. sad, sorrow, gloom, grief, inconsolability, dejection, desolation, happy, disappointed, angry, scared, afraid, and disgusted, or other emotion words that directly described the emotion categories) so that participants will guess the emotion based on the verbal and non-verbal cues. Therefore, the participants were asked to indicate the existence of the emotional instances of each emotion category on a Likert scale. So, every participant indicated the presence of an instance that had been constructed in his/her brain by past experiences and emotional concepts.

After watching each video, participants were asked to rate the emotional category in the video on a 7-point Likert scale ranging from 1 (absolutely not) to 7 (absolutely yes). The emotion labels were: *sadness*, *anger*, *happiness*, *disgust*, *surprise*, *fear*, and *neutral*. The term neutral does not refer to any specific emotion, but this term was used “to denote the absence of any discernible effect” (Dromey et al., 2005, p. 354). Mean scores were calculated for the emotion perception of the videos in Arabic and in English.

Cronbach alpha for reliability was calculated for the EP scores in both languages. The alpha values for the EP scale in Arabic (.78) and in English (.80) were good.

Moreover, to ensure the validity of each stimulus used in this study, participants' actual responses to the EPT and the intended emotions for each stimulus were compared. Table 1

shows that participants scored higher on the intended emotions for each audio-visual stimulus.

Procedure

Snowball sampling was used to recruit English L1 users and Arabic-English speakers. The online survey was shared through social media and mailing lists. The Arabic-English L2 users and Arabic L1 users were volunteers but the English monolinguals from the UK, USA, Canada, and Australia were selected through a digital agency (Survey Gizmo) and compensated for their participation. The study received ethical approval from the Ethics board at the authors' research institution.

Data distribution

A series of one-sample Kolmogorov-Smirnov tests showed that the values for Emotion Perception Task are not normally distributed (K-S Z-values range from .12 to .31 [all significant at $p < .0001$]). As a consequence, we opted for nonparametric statistics.

Table 1. Mean EP scores of the intended emotions vs. actual responses of the emotions ($n = 609$)

Intended Emotion		Actual Responses													
		Emotions in English													
		Anger		Fear		Sadness		Disgust		Surprise		Happiness		Neutral Emotion	
M	SD	M	SD	M	SD	M	SD	M	SD	M	SD	M	SD		
Anger	5.3	1.9	1.9	1.5	2.9	1.9	3.5	2.1	3.5	1.9	1.7	1.4	2.5	1.8	
Fear	4.0	1.9	4.1	1.9	3.7	1.9	3.1	1.9	2.9	1.7	1.7	1.4	2.8	1.8	
Sadness	2.5	1.6	2.2	1.6	4.6	2	2.9	1.8	2.9	1.7	1.7	1.3	2.9	1.9	
Disgust	2.8	1.8	2	1.5	2.3	1.6	5.7	1.8	3.4	1.8	1.9	1.5	2.5	1.9	
Surprise	1.8	1.5	1.9	1.5	1.8	1.4	1.9	1.5	5.5	1.8	3.5	1.9	2.9	1.8	
Happiness	1.4	1.1	1.5	1.2	1.5	1.1	1.5	1.2	4.5	1.9	6.1	1.3	2.4	1.9	
Intended Emotion		Emotions in Arabic													
		Anger		Fear		Sadness		Disgust		Surprise		Happiness		Neutral Emotion	
		M	SD	M	SD	M	SD	M	SD	M	SD	M	SD	M	SD
Anger	5.3	2.3	2.9	1.9	3.4	2.1	3.1	1.9	3.1	1.9	1.7	1.4	2.6	1.8	
Fear	3.3	1.9	5.2	2.3	2.1	1.6	3	1.9	3.4	1.9	1.8	1.4	2.6	1.8	
Sadness	2.7	1.8	2.4	1.8	5.1	2.3	2.8	1.9	3.3	1.1	1.7	1.4	2.8	1.9	
Disgust	3.3	1.8	2	1.4	2.4	1.7	5.9	1.9	3.3	1.8	2	1.5	2.7	1.8	
Surprise	1.5	1.2	1.6	1.3	1.4	1.1	1.6	1.3	5.7	1.9	4.4	1.5	2.4	1.8	
Happiness	1.6	1.3	1.6	1.3	1.7	1.4	1.7	1.4	2.6	1.7	5.8	1.9	3	1.9	

Results

EP scores of bilinguals and monolinguals

A first Kruskal-Wallis test revealed that there was a significant effect of group on EP scores in the **Arabic videos** ($\chi^2(2) = 243.7, p < .0001$). To follow this up, a series of Mann-Whitney tests indicated that Arabic-English bilinguals were significantly higher than the English monolinguals ($U = 7317, z = -15.3, p < .0001$, Cohen's $d = 1.8, r = .65$ (i.e. a large effect size)⁶), but the difference was not significant between bilinguals and Arabic monolinguals ($U = 6350, z = -1.6, p = .10$, Cohen's $d = .33, r = .09$) (see Figure 1).

A second Kruskal-Wallis test also revealed group effect on EP scores in **the English videos** ($\chi^2(2) = 42.5, p < .0001$). A series of Mann-Whitney tests indicated that Arabic-English bilinguals were significantly higher than Arabic monolinguals ($U = 4171, z = -5.36, p$

< .0001, Cohen's $d = .70$, $r = .32$ (i.e. a large effect size) and also –surprisingly– higher than English monolinguals ($U = 24459$, $z = -5.53$, $p < .0001$, Cohen's $d = .45$, $r = .23$ (i.e. a small effect size) (see Figure 1). The EP mean scores and standard deviations for the Arabic and English videos are presented in the table below.

Table 2. EP (mean) scores and standard deviations of Arabic monolinguals, English monolinguals and Arabic-English bilinguals

EP scores		Arabic monolinguals ($n = 71$)	English monolinguals ($n = 333$)	Arabic-English bilinguals ($n = 205$)
EP in Arabic	<i>Mean</i>	5.19	3.79	5.63
	<i>Standard deviation</i>	1.51	1	1.04
EP in English	<i>Mean</i>	4.65	5.01	5.56
	<i>Standard deviation</i>	1.35	1.22	1.22

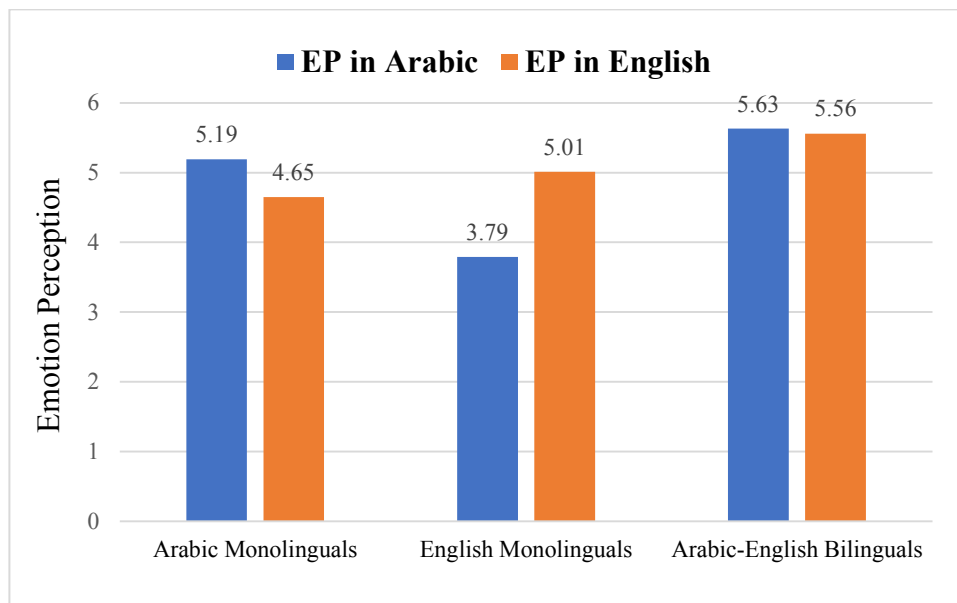


Figure 1. EP scores of Arabic monolinguals, English monolinguals and Arabic-English bilinguals in both languages

Trait EI scores of Arabic-English bilinguals and monolinguals

A Kruskal-Wallis test showed a significant group effect in levels of Trait EI: $\chi^2(2) = 11.23$, $p < .004$. A series of Mann-Whitney tests indicated that Arabic-English bilinguals ($M = 4.8$, $SD = .72$) had significantly higher Trait EI scores than Arabic monolinguals ($M = 4.58$, $SD = .74$) ($U = 6164$, $z = -1.92$, $p = .05$, Cohen's $d = .30$, $r = .11$) and English monolinguals ($M =$

4.57, $SD = .9$) ($U = 28424$, $z = -3.26$, $p < .001$, Cohen's $d = .28$, $r = .14$). The effect sizes are small in both cases. There was no statistical difference in Trait EI scores between the two groups of monolinguals: $U = 11347$, $z = -.53$, $p = ns$ (see Figure 2).

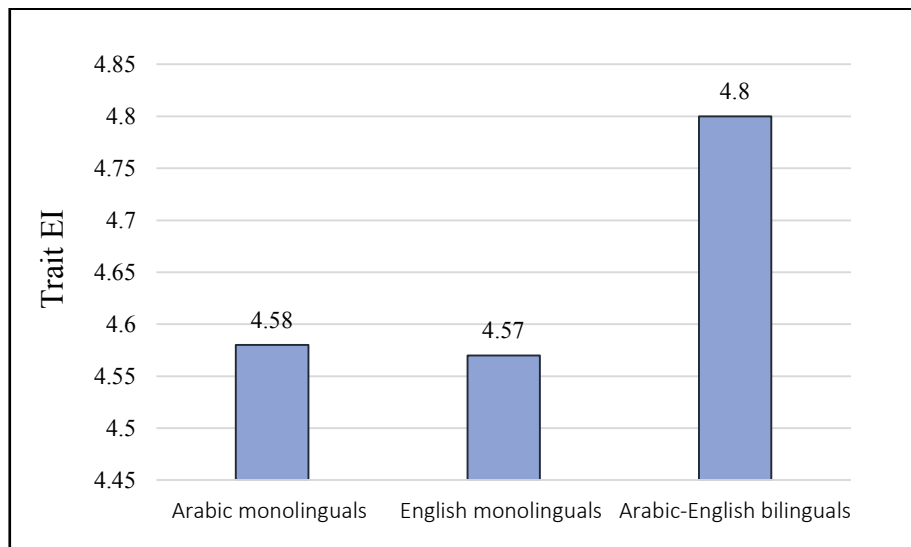


Figure 2. Trait EI mean scores of Arabic monolinguals, English monolinguals and Arabic-English bilinguals

The relationship between Trait EI and EP in the three groups

A Spearman rank correlational analysis between Trait EI and the EP in both languages for **the bilingual group** showed that the Trait EI was positively and strongly correlated with EP score in **Arabic** ($\rho (205) = .216$, $p < .002$, representing 4.6% of shared variance, i.e. a small effect size (Plonsky & Oswald, 2014)) and in **English** ($\rho (205) = .226$, $p < .001$, representing 5% of shared variance, i.e. a small effect size).

A Spearman rank correlational analysis between Trait EI and the EP in both languages for **English monolinguals showed** that the Trait EI was positively and strongly correlated with EP score in **English** ($\rho (333) = .215$, $p < .0001$, representing 4.6% of shared variance, i.e. a small effect size (Plonsky & Oswald, 2014)), but not in Arabic ($\rho (333) = -.05$, $p = ns$).

A Spearman rank correlational analysis between Trait EI and the EP in both languages for **Arabic monolinguals** showed that the Trait EI was not significantly correlated with EP scores in Arabic ($\rho (71) = -.01$, $p = ns$) or in English ($\rho (71) = .03$, $p = ns$).

Discussion

The answer to the first research on the bilingual advantage for emotion perception (EP) was partially positive as a significant group effect was detected in the EP scores of both the Arabic and the English videos. Closer analysis revealed that the EP scores of Arabic-English bilinguals were significantly higher than those of the English monolinguals in **the Arabic videos** but not significantly higher than the Arabic monolinguals. **This makes perfect sense as the** English monolinguals did not know the Arabic language nor culture and had therefore fewer cues about the emotional state of the speaker. **The** lack of a significant difference between the Arabic-English bilinguals and the Arabic monolinguals means it is impossible to claim that there is a bilingual advantage in the Arabic videos.

The Arabic-English bilinguals scored significantly higher than Arabic monolinguals in the **English** videos, which is again self-evident as they know the language and the way emotions are communicated between English interlocutors. The most surprising finding was that the Arabic-English bilinguals significantly outperformed the English monolinguals in the English videos (albeit with a small effect size). This reflects the finding reported in Lorette and Dewaele (to appear b) where the 464 English LX users outperformed the 656 (multilingual) L1 users in their ability to recognise emotions in English, which the authors attribute to possible interferences from their other L1(s) or L1 culture(s). It suggests that the marginal difference reported in Dromey et al. (2005) between monolingual and multilingual English L1 users, with the latter having an advantage, might not have been random. While L1 users have the benefit of having a life-time experience of dealing with vocal affect in their L1, LX users may have made an extra conscious effort to recognise affect in their LX, especially if it differed from their own L1. We cannot exclude Dromey et al.'s (2005) alternative explanation either, namely that the Arabic-English bilinguals had quickly developed a superior ability to identify emotions, which may have strengthened their motivation to learn an LX, which may in turn have increased the probability of them moving abroad. Another explanation for this unexpected result in the present study is that most of the bilingual participants were authentic users of English (contrary to the learners in Rintell, 1984 and Graham et al., 2001) and half of them were in ESCs at the time of study and a majority of them (59%) learned English through both naturalistic and formal instruction contexts; in addition, about 30% of them had been in ESCs for more than 6 years. Therefore, they were more likely to have had experienced more emotional experiences during their stay in L2 culture, which might have boosted their emotion perception in L2. These bilinguals

may have developed more metalinguistic and metapragmatic awareness of cultural and linguistic differences in the way emotions are expressed in both Arabic and English, allowing them to outperform the monolinguals in English emotion recognition. The findings of this study differ from emotion recognition studies that reported no significant differences between L1 and LX users (Dromey et al., 2005; Lorette & Dewaele, 2015) or found that the L1 users performed better than the LX users (Lorette & Dewaele, to appear a; Rintell, 1984; Graham et al., 2001).

The answer to the second research question about the advantage of Arabic-English bilinguals over Arabic and English monolinguals on Trait EI was positive. The bilinguals did score higher on Trait EI, although the effect size was small. This confirms earlier research on the positive (but small) effect of multilingualism on various psychological dimensions (Dewaele, 2013; Dewaele & Stavans, 2014; Dewaele & Li Wei, 2012, 2013; Dewaele, Petrides & Furnham, 2008).

The answer to the third research question is unequivocally positive as Trait EI was found to have a significant positive relationship with the EP scores of all participants. Participants with high Trait EI levels were better at perceiving and interpreting the emotions depicted by the videos, but the effect size was small. There are several possible explanations for this association between Trait EI and EP. One explanation could be that participants with high levels of Trait EI might have rich emotion concepts (Barrett, 2017) that allow them to predict the emotions that fit the situation. These results match those observed in earlier studies in which participants with high Trait EI scores did better in ERA tasks (Austin, 2004; Ciarrochi et al., 2001; Dewaele et al., in press; Petrides & Furnham, 2003). The bilinguals' emotional advantage might be attributed not to the bilinguals' experience of L2 acquisition *per se*, but also to their high levels of Trait EI and well-being, and therefore allow them to easily interpret the emotions of others. Our correlational design does not allow us to claim any causal relationship between Trait EI and EP. However, it is highly likely that high EP (a single skill) is the consequence of higher levels of Trait EI. It is unlikely that multilingualism in itself boosts Trait EI (Dewaele, 2018c) but other factors may have played a role. It is possible that our bilinguals enjoyed the challenge of identifying emotions English more than monolinguals.

A word of caution is also needed about the interpretation of the statistical evidence concerning group differences and relationships between independent and dependent variables. While a significant effect was found for EP in English (but not Arabic), the effect size was small. Also, the higher scores of bilinguals for Trait EI represented only a small

effect size. In other words, we can at most claim to have found a small bilingual emotional advantage. The difference between the bilingual and the English monolingual group could also be linked to the fact that the latter were paid to participate in the experiment while the former were self-selected. It is therefore possible that the bilinguals had a stronger intrinsic interest in the tasks.

Conclusion

The present study heeded de Bot's (2017) call to extend research on the BA beyond executive functioning and to dig into the specifics of the social and psychological advantages that bilinguals have. Our Arabic-English bilinguals were found to have a significant (but small) advantage over English monolinguals in emotion perception of six English video clips. They also scored significantly higher on Trait EI (albeit with a small effect size), extending previous research findings that bilingualism can have a significant but small effect on some personality traits and emotional and communicative skills. We argue that our bilinguals may have developed stronger awareness of emotional communication than monolinguals because of a realisation of the differences in which emotions are communicated in Arabic and in English. Trait EI, more importantly, is related to the emotion-laden information which may increase the ability to construct a variety of emotional predictions that fit each situation (Barrett, 2017). High levels of Trait EI might boost the understanding of emotional communication in the LX. To conclude, the findings of present paper suggest that our Arabic-English bilinguals had a significant but small psychological and emotional advantage over English monolinguals.

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Appendix A: The transcription of the stimuli used in this study:

English videos:

1. *Fear*: <https://youtu.be/tAhklACJ0oM>

A: So Hilary, are you still trying to be a teacher?

B: Yeah, I am. Yes. Well, you know I had not got very well, and I did the whole year, but I didn't get credits. I did not get enough credits to carry on the next year. Well, thankfully, they can let me do it, but I've to pass this term.

A: You mean to...

B; I do. I have to, and if I don't then that's it. And I won't be a teacher. I'll not get a job, obviously in the career that I want happen for me, and my family will really be upset because, well.... I have to borrow some much money. As you know...

A: Are they from your dad?

B: Yeah, it's about 20 thousand pounds all together, and if I don't pass it, then, well, it's going for nothing, isn't it?

2. *Happiness*: <https://youtu.be/aKRXHB-C9UI>

B: Did you hear about the job Gwylum?

A: Yes, I did, and I got it.

B: Ooh. Brilliant.

A: I got thirty-thousand pounds start in salary.

B: Nooo!

A: Yeah, and it's just great...I get a pension. It's really really good.

B: When did you start?

A: I started in 2 weeks, 2 Mondays start.

3. **Disgust:** <https://youtu.be/PfRS6lgXQGo>

B: So did you go around James?

A: Yeah. God!... His house. It ..yeah.. I mean yes his food; his plates were in the washing-up for about two weeks.

B: Oh, God!

A: It was overhead. His dog and the hairs were all over the sofa and rug. I didn't know where to set. I wanted to get out of there as soon as I could. I really did.

B: Mmmm.

4. **Sadness:** <https://youtu.be/QuggadJrOCs>

B: Did you get here aright Gwilum?

A: Oh, Yeah. I was in the bust stop, and it was near the tube station, and there was in a disabled boy.

B: Mmm

A: with that two crutches.

B: Ohhh.

A: Yeah. He's really struggling...to get out of the stairs.

B: Oh. no.

A: No one was helping him. I didn't know. You know I wanted to be in the bus quite quickly, but I would've helped him if he's still, you know trying to get out of the stairs because he's really struggling....

B: Ummm

A: It's not easy to watch him.

B: I think someone would help.

5. **Anger:** <https://youtu.be/YZRwQFobtzc>

B: So what did happen last night?

A: It didn't happen. Lisa didn't turn up.

B: She didn't turn up!!

A: She didn't turn up. She never texted me. She didn't tell me. That's three hours of cooking plus shopping plus 50 equipment of food. She didn't turn up. What kind of a person does that?

B: What did she text?

A: She didn't even text. She still hasn't texted till now. What kind of a person does that?!!

B: It's really really....

A: So I wasted time, money, shopping. I can't believe it. Aright.... I can't believe it.

6. **Surprise:** <https://youtu.be/rMkKZmxXgz4>

B: Well. I went to James' party last night.

A: Yeah.

B: Yub, and you'd never guess who was there?

A: Who's there?

B: Enn.

A: Enn Johns. No way. I've not seen him.... Enn Johns was there!!

B: He was.

A: I've not seen him for 10 years. Is he still with Sally?

B: Well. They split up actually.

A: Oh, really. I can't believe they split up.

B: Yeah. He's alone.

A: Oh my God. I can't believe that.

Arabic Videos (English translation of the transcripts):

1. **Anger:** <https://youtu.be/sYqjlRAdVco>

B: How was the exam today?

A: Oh. Please, brother don't remind me. It was very bad. I will fail. I am 100% sure. I will definitely study it again in the next year. There is no hope. You know, the teacher gave us only two questions out of 100, each one is out of 50 marks.

B: Did you study hard?

A: I did, but I can't believe it is a final exam with only two questions.

B: Yeah. it's unbelievable to have only 2 questions.

A: Yeah, but this is his method in exams. What can I do now?

2. **Disgust:** <https://youtu.be/AsS6yVUcleg>

B: How was the lunch today?

A: Oh, God honors graces.

B: What happened?

A: Oooh, all the food contained ham meat, and I did not like the smell.

B: I seek refuge with Allah from this.

A: And the smell. It was awful. I seek refuge with Allah from the cursed Satan. And you know, the problem was that they eat all the time, and once upon time, I entered a room and I wanted to get out of there because of the bad smell.

3. *Surprise:* https://youtu.be/6zEgKjk_aW4

B: Can you believe that I have been accepted in the university.

A: Mashallah, congratulations. Is it for a master's?

B: Yeah. Thank Allah.

A: in which university?

B: in Reading.

A: Mashallah, is it in media?

B: Yeah in media.

A: Mashallah. And is it full time or part time?

B: Full time.

A: Uh. so that means only one year.

B: Yeah.

4. *Happiness:* <https://youtu.be/8xg8hmJRd38>

B: By Allah. A dream has come true for me. You know I was waiting to study media.

A: Mashallah.

B: This is, you know, a hobby before it is a desire to study it.

A: Now, it has become your specialization.

B: Yes. It is both a hobby and a desire to study. They complete each other. A praise be to Allah.

A: How do you feel?

B: I feel comfortable.

A: Do you feel like as if you connected to your lover, hhh

B: Yeah. hhh

5. **Sadness:** <https://youtu.be/BWG1Zlrgxw>

B: How are AbdullRahman?

A: Praise be to Allah, everything will be fine.

B: Why? What did happen?

A: Today, I had a very difficult situation. I went to the hospital with my son because he was not feeling well. There I faced a difficult situation. when I was in the hospital, I saw a man crying so hard. And when I asked him, he told me that his father had died. And he also told me that his father was angry with him before he died. At that time, I did not know what to say to him.

6. **Fear:** <https://youtu.be/Vi6YnWeAyEs>

B: Why have you not bought a car yet?

A: Please don't ask me to buy a car. I can imagine doing anything but not driving a car

B: Why?!

A: I have a problem with driving since the accident that had happened for my best friend. You know I did not know what happened to me. So, I cannot imagine that. I cannot drive the car anymore. If I do, I think I would have an accident.

¹ Of which 18 were Chinese L1 users.

² To avoid the terms “non-native” versus “native speaker”, which implies the superiority of the latter, we use the value-neutral terms first and foreign language user (L1 and LX user) (cf. Dewaele, 2018a).

³ 7.8 % of participants did not mention their education level.

⁴ **The present study is a part of a larger research project. A closer look at the socio-biographical factors revealed that bilinguals' education levels, gender, age, age of onset of acquisition, contexts of L2 acquisition, length of stay in ESCs were not statistically related to**

the EP scores in both languages. Frequency of English use was significantly and positively related to the EP scores in English for the bilingual group.

⁵ Gender of the speaker in the videos was not linked to participants' EP scores.

⁶ Cohen (1988, p. 40) proposed that $d = .20$ describes a small effect, $d = .50$ a medium effect and $d = .80$ a large effect.