The Role of Language and Cultural Engagement in Emotional Fit with Culture: an Experiment Comparing Chinese-English Bilinguals to British and Chinese Monolinguals[1]

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Abstract

The current study investigated to what extent language and culture shape emotional experience. Specifically, we randomly assigned 178 Chinese-English bilinguals to report on emotional situations, cultural exposure, engagement, and language proficiency in either English as a foreign language (LX) or Chinese (L1). We established their fit with both the typical patterns of emotions among British and Chinese monolinguals and predicted these fit indices from the survey language, cultural exposure, and engagement. Whereas monolinguals fitted their own culture's emotional patterns best, bilinguals fitted both the typical LX and L1 patterns equally well. The survey language affected bilinguals' emotional fit, but there was no evidence for true frame switching. Rather, bilinguals with low exposure to English encountered a drop in emotional fit when using English. Yet, this negative effect of survey language was buffered when bilinguals had better quality interactions with Westerners that are likely to foster conceptual restructuring in the LX.

Keywords: Emotion, language, Culture, Bilingualism, Frame Switching, Emotional Fit

LANGUAGE, CULTURE, & BILINGUALS' EMOTIONAL FIT

Emotion research is characterized by debates on the extent to which emotion is shaped by either language, culture (i.e., the meanings and practices shared within one's (local) community), or both (Dewaele, 2015). Whereas most Basic Emotion Theories consider language and culture as irrelevant to emotional experience (i.e., they only matter for emotion regulation; Ekman, 1992; Levenson, 2011), most constructionist theories of emotion consider them as key ingredients. In psychological constructionist theories (Barrett, 2006; Linquist & Gendron, 2013), language is thought to provide access to particular emotion concepts, which are necessary to translate changes in valence and arousal (i.e., 'core-affect') into 'emotions' by labeling these states. In socio-cultural constructionist theories (Boiger & Mesquita, 2012; Mesquita et al., 2017) culture is thought to provide access to particular ways of meaning-making, which are necessary to translate changes in the environment into events that urge a person to take a particular stance and thus, to *emote*.

In the current research, we aim to contribute to this debate by investigating *to what extent* people's patterns of emotional experience – that are, the intensities with which one experiences a set of emotions in a particular situation – are shaped by both linguistic and cultural factors. As we will outline below, studies have shown that *both* language and culture shape emotional experience, but have often failed to disentangle their effects, either by the nature of their research design or by the choice of certain participant groups. Of course, language cannot be seen as completely separable from the cultural meanings and practices that are common in the context that uses that language. But, knowing a language does not automatically grant access to (often implicit) cultural meanings and practices, while exposure to a certain culture does not necessarily lead to mastering the local language. Hence, it may be worthwhile to try to examine the degrees by which language and culture each shape people's emotional patterns as well as whether their effects are either additive or interactive.

To do so, the current research i) made use of an experimental (frame switching) design; ii) included bilinguals varying in their levels of cultural exposure; and iii) quantified the extent to which bilinguals' emotional experiences were in line with those of the monolingual-monocultural groups of their heritage and host contexts. Specifically, the current study tested if Chinese English bilinguals' *emotional fit with culture* – i.e., the similarity between their *own* emotional pattern and the *typical* Chinese or British pattern of emotion in a particular type of situation (e.g., De Leersnyder et al., 2011) – is shaped by i) the language they were randomly assigned to when completing our survey and ii) their cultural exposure, engagement, and language proficiency.

Changes in Language, Culture, and Emotion

The current research focuses on bilinguals with varying degrees of cultural exposure because previous research on bilinguals and biculturals has provided the most convincing evidence for the roles of language and culture in emotional experience. For instance, strong evidence for the cultural shaping of emotion comes from studies on *emotional acculturation* (De Leersnyder et al., 2011). These studies build upon the rich literature that different cultural contexts are characterized by different patterns of emotional experience (e.g., Boiger et al., 2013; Kitayama et al., 2006; Mesquita & Leu, 2007; Tsai & Clobert, 2019) to hypothesize that people's emotional patterns may *change* due to sustained contact with another culture (such as when people migrate). To quantify this change, emotional acculturation researchers calculate both majorities' and immigrant minorities' *emotional fit with culture.* In a first step, and getting at people's *emotional patterns*, they ask participants to report the intensity with which they experienced a set of emotions in a particular type of situation. Then, they calculate *typical pattern*s of emotion per cultural group by averaging the (situation-specific) emotional patterns of all group members. Finally, they calculate each individual's *emotional fit* with a particular

(majority) cultural group by running a profile correlation between the *individual's* emotional pattern and the *typical* pattern of that cultural group for the corresponding type of situation (e.g., De Leersnyder et al., 2011). Research using these emotional fit scores showed that first generation minorities fit significantly worse with the majority's typical emotional patterns than majority members themselves. Yet, immigrant minorities' level of emotional fit with the majority was higher if they belonged to a later generation, had more exposure to the majority culture, and had more (close) contacts with majority members (Consedine et al., 2014; De Leersnyder et al., 2011; Jasini et al., 2019, 2020). This is not to say immigrant minorities inevitable 'lose' their fit with the heritage culture patterns: they seem to maintain their fit to the extent that they have more friendships (i.e., high-quality contact) with heritage culture members with whom they can continue to practice the heritage patterns (De Leersnyder et al., 2020). Taken together, *changes* in people's cultural engagements co-occur with changes in their emotional fit with a particular culture's typical patterns of emotion, thereby suggesting that cultural engagement shapes emotional experience.

Mirroring this type of evidence, studies in applied linguistics have documented how changes in people's language knowledge and use affect their emotional life. For example, users of a foreign language (LX) may struggle to get across the nuanced, sophisticated, and confident selves they are in their first language (L1) when using the LX (e.g., Hoffman, 1989). Many multilinguals who love a partner in an LX report at the start of the relationship that lexical and conceptual limitations hamper their communication of emotion and that a lack of emotional resonance of the LX causes a feeling of inauthenticity – LX emotion words often feel disembodied, swearwords lack power and expressions of love feel tepid and detached (Caldwell-Harris, 2014; Dewaele, 2004, 2013, 2018). However, these difficulties can be (partly) overcome with sufficient LX practice and exposure (Dewaele & Salomidou, 2017). Similarly, studies that documented an initial mismatch between the semantic and conceptual

representation of emotion words across bilinguals' L1 and LX, found that practice and exposure foster a process of gradual conceptual restructuring such that bilinguals develop "new multimodal representations that allow […] to map new [emotion] words onto real-world referents similar to native speakers of the target language" (Pavlenko, 2009, p. 141). Thus, *changes* in people's language knowledge and language use reshape their emotional experience.

Both language and culture thus shape people's emotional experience. Yet, many questions remain because most studies i) have *either* focused on language/bilinguals *or* on cultural engagement/immigrant minorities, ii) have *not* made use of experimental designs to disentangle linguistic and cultural effects, and iii) have not used techniques to quantify cultural/linguistic similarity in emotional experience. The current research aimed to overcome these limitations by investigating *the extent* to which language and culture shape people's patterns of emotional experience as well as on the (additive vs. interactive) *ways in which* they may do so.

Cultural Frame Switching in Emotions

Specifically, the current study focused on bilinguals with varying degrees of cultural exposure and used an experimental paradigm to investigate if language use (LX vs. L1) could trigger frame switching in the domain of emotion, as quantified by one's cultural fit with the typical patterns of emotion of the host (LX) or heritage (L1) culture. Cultural frame switching refers to the phenomenon by which biculturals, who have (to some extent) internalized multiple cultural meaning systems and according psychological repertoires, switch between these repertoires depending on their context of interaction and/or the language that is used (Hong et al. 2000). As such, an *emotional* frame-switching paradigm

allows to investigate to what extent people's experience is shaped by the situational language use or context as well as by the bilinguals'/biculturals' cultural exposure and general level of language proficiency.

To date, very few studies have investigated frame switching in the domain of emotion and when they did, they mainly focused on the situational aspects that shaped biculturals' experience. Evidencing the role of language in emotional frame switching, one study found that American English and Cypriot Greek bilinguals who listened to the same story in both languages adjusted their sociocultural expectations according to the language (Panayiotou, 2004). Highlighting cultural engagement, however, another study showed that first generation Turkish Belgian minorities fitted the typically Turkish patterns of emotion better than the Belgian ones when interacting in Turkish contexts, whereas the opposite was true for second generation minorities when interacting in Belgian contexts (De Leersnyder et al., 2020). Finally, and pointing at the role of both linguistic and cultural factors, an experience sampling study (Perunovic et al., 2007) showed that when Asian Canadians had recently spoken an Asian language or identified mostly with an Asian culture, their positive and negative moods were quasi non-related (which is in line with the Asian ideal of dialecticism); in contrast, when they had recently spoken a non-Asian language or identified mostly with a Western culture, their positive and negative moods were negatively associated with one another.

The Current Study

Extending this prior work, the current study employs the frame-switching paradigm among bilinguals to systematically investigate *the extent to which* multiple linguistic and cultural factors contribute to their emotional *fit* with the typical cultural patterns of their respective LX and

L1 cultural contexts. Concretely, we randomly assigned Chinese English bilinguals, with varying degrees of English language proficiency and cultural exposure to English-speaking contexts to take our study in either English or Chinese. We then investigated their emotional fit with the typical Chinese and typical British patterns of emotion in both positive and negative situations as a function of linguistic and/or cultural factors.

Firstly, we tested whether the cultural groups differed in emotional fit as a function of their general cultural exposure such that i) monolingual-monocultural British would fit better with the typically British than Chinese patterns; ii) monolingual- monocultural Chinese would fit better with the typically Chinese than British patterns; and iii) Chinese English bilinguals would fit about equally well with both patterns (H1). Secondly, we tested if the (situationally manipulated) survey language affected bilinguals' levels of emotional fit, expecting that those responding in English would show higher fit with the typically English patterns while those responding in Chinese would show higher fit with the typically Chinese patterns (H2). Thirdly, we tested the combined effects of (situational) survey language and (individual's) cultural exposure. Specifically, and as assumed by the frame-switching literature (e.g., Hong et al., 2000), we hypothesized an interactive effect such that bilinguals with extensive cultural exposure to English-speaking contexts would show frame switching (i.e., higher fit with typically English patterns when using English than when using Chinese), whereas bilinguals with little cultural exposure would not show this effect (H3). Finally, and turning to an exploratory mode, we investigated the interplay – and thus additive vs. interactive effects –between survey language and different indices of cultural engagement, such as bilinguals' quantity and quality of contact with the mainstream culture members on their emotional fit with both the British and Chinese culture.

Methods

Participants

This study is a between-subject survey experiment among Chinese English bilinguals who were randomly assigned to take our study in either English or Chinese. To establish cultural fit and test H1, however, this target group was complemented with two comparison groups, namely a monolingual British and a monolingual Chinese group who completed our survey in their L1. The target group of bilingual participants was born in a Chinese-speaking country, had spent most of their life there, and/or held the Chinese nationality. The comparison groups were British and Chinese monolinguals who were born in, and spent most of their lives in either the UK or China, respectively. Eighty-one participants who completed our questionnaire but did not meet the criteria to be categorized into one of these three cultural groups, were deleted from further analyses (see OSM Appendix F for full demographic details on the (excluded) participants). Our final sample consisted of 288 respondents: 178 bilinguals, 55 British, and 55 Chinese monolinguals.

All three samples consisted of more females than males (66%; 2 absent), but the samples did not differ from one another in their gender composition ($X^2_{(2)} = 4.26$, $p = .12$). However, the samples differed in terms of mean age ($F_{(2, 277)} = 17.04$, $p < .001$), with British monolinguals ($M = 41.32$, SD = 16.69) being significantly older than both Chinese monolinguals ($M = 33.7$, $SD = 11.70$) and bilingual participants ($M = 30.34$, $SD = 10.03$). Moreover, the samples also differed in terms of education level ($F_{(2, 280)} = 22.53$, $p < .001$) with bilingual participants having a higher education level than both other groups.

Procedure

The online survey study was conducted in two waves: in 2018 and 2019. At both waves, we recruited participants through snowball sampling by spreading the link to our study via emails in our network, social media (i.e. Facebook, Wechat), and flyers that we distributed in London at places commonly visited by Chinese English bilinguals (e.g., buildings of the different colleges that constitute the University of London, Chinese supermarkets, etc.). In 2018, the study took 20 minutes to complete and was characterized by a high drop-out rate: Only 215 of the 1022 (21%) people who clicked the study-link completed the entire survey. The survey was shortened by half in 2019, resulting in a higher completion rate: 155 of the 479 (32%) people who clicked the link completed the entire survey. Applying the strict participant criteria outlined above, 137 participants from the 2019 dataset and 151 from the 2018 dataset were retained for analyses. All measures that were included in both the long (2018) and short (2019) version of this study can be found in the OSM (Table A1).

The study was introduced as "a study on people's emotional life", and participants did not receive any monetary compensation for their participation. At the start of the questionnaire, all participants were asked which languages they were capable of using (English, Chinese, or both). Bilinguals were randomly assigned to complete the questionnaire in either English or Chinese; Monolinguals completed the questionnaire in their respective L1. Before the study, participants signed an informed consent; afterwards, they were fully debriefed. The study was approved by the Ethics Committee of the Psychology Department of the University of Amsterdam (2018-SP-8848). All materials were translated from English to Chinese and then back-translated by two fully proficient Chinese English bilinguals with a background in Emotion Psychology.

Materials

Demographic Questions

Participants reported on their age, gender, country of residence and educational level. In line with common practice within social psychological studies, the latter variable served as a proxy for participants' socio-economic status.

Emotional Fit with Culture

Participants' emotional fit with culture was established on the basis of their emotional patterns across different situations. Therefore, we administered a shortened-version of the Emotional Patterns Questionnaire (EPQ; De Leersnyder et al., 2011) among both monolingual and bilingual participants. The EPQ asks participants to first describe an emotional situation from their own daily life that matches a specific prompt and then to rate their experience in that situation on a list of emotions (1 = Not at All; 7 = Very). At both waves of data collection, all participants were first prompted to describe a positive disengaging (i.e., autonomy-promoting) situation and then to describe a negative disengaging situation that had occurred to them while interacting with friends. After describing each situation, participants rated how strongly they had experienced each one of a list of emotions in the situation they just described. In the (long) 2018 version we had included 35 emotion items. To establish cross-cultural equivalence of these items across the two participant groups, we conducted a Multi-Block Simultaneous Component Analysis (De Roover et al., 2012) that tests if the underlying component structures are similar (enough) across the monolingual and bilingual groups. This analysis yielded 4 emotion components that corresponded to the ones we had theoretically intended to obtain – i.e., positive engaging, negative engaging,

positive disengaging, and negative disengaging emotions. Moreover, it indicated that the common component solution explained 61% of the variance in emotions in each cultural group, which is about as much as separate principal component analyses would do, thereby suggesting cross-cultural equivalence. To shorten the survey in 2019, we retained the five items with the highest factor loading for each one of the 4 emotion components, resulting in a set of 20 emotion items that participants had to rate after describing their emotional situation. Full details on the EPQ-prompts and emotion items as well as on the Multi-Block Simultaneous Component Analysis can be found in the OSM (appendix A, Table A1 and A2).

To establish people's emotional fit with culture, we followed the procedure developed by De Leersnyder and colleagues (2011). In a first step, we obtained the emotional patterns that are typical for British and for Chinese monolinguals by aggregating their respective ratings on the list of emotions. Subsequently, we calculated each participant's "fit" with both the typically British and Chinese emotional patterns. We did so by correlating each individual's pattern to the typically Chinese and British pattern for the corresponding type of situation (i.e., positive or negative). To correct for potential artificial inflation of monolinguals' fit scores, we correlated each monolingual participant's pattern to an average pattern of *all others* in one's own group (i.e., an average *excluding* one's own ratings). In a final step, we applied a Fisher's Z transformation to the raw correlation scores in order to make them follow a normal distribution.

As can be derived from the description above, each participant thus got two emotional fit scores with the typical British pattern and two with the typical Chinese patterns, each time one for positive and one for negative situations. However, since we expected no differences in the associations between our predictor variables and emotional fit in positive versus negative situations, we collapsed the two scores to obtain one

Mean Emotional Fit Score with each culture**.** However, since fit scores in positive emotional situations tend to be significantly higher than fit scores in negative situations across all cultural groups (De Leersnyder et al., 2011, 2020; Jasini et al., 2018), we report on analyses that include either the fit in positive or the fit in negative situations in the Online Supplementary Materials (Appendix B). In the few cases that analyses showed different results across the positive and negative emotional fit scores, we report these differences in a Footnote in the Results section.

For those analyses that pertain to whether bilinguals fit better with the one or the other culture's typical patterns of emotion, we made use of a *Difference Score* that juxtaposes each individual's emotional fit with the typical British versus typical Chinese patterns. We calculated this difference score by subtracting each individual's fit score (i.e., Fischer-transformed profile correlation score) with the typical Chinese pattern from their fit score with the typical British pattern. Hence, a positive difference score indicates a more prominent fit with the British emotional patterns, whereas a negative difference score implies a more prominent fit with the Chinese emotional patterns. Given that these difference scores were similar across positive (M = .02, SD = .28) and negative situations (M = .01, SD = .34; $t_{(272)}$ = .38, p > .05), we also collapsed across the two difference scores to obtain just one *Mean Difference Score* (M = -.01, SD = .23).

Survey Language

The survey language was the language to which the Chinese English bilingual participants were randomly assigned to complete the entire questionnaire: English (n = 90) or Chinese (n = 88). Monolingual participants completed the questionnaire in their L1.

Cultural Exposure

Participants' cultural exposure was operationalized in different ways. First of all, our *grouping variable* into English monolinguals residing in the UK, Chinese monolinguals residing in China, and Chinese English bilinguals residing in either China or the UK, can be taken as an indication of exposure to the British and Chinese cultural contexts. Secondly, we asked bilingual participants to indicate their *Length of Residency in English-speaking Countries* (*M* = 4.43*; SD* = 9.05), which can be taken as an indicator of the degree of cultural exposure to this cultural context.[2]

Cultural Engagement

Several factors related to cultural engagement were included in the exploratory analyses. Specifically, we measured participants' *Quantity of Social Contact with Westerners* (vs. Chinese) by asking them to estimate the ethnic-cultural background of their colleagues/classmates, friends, and acquaintances, respectively, on a 7-point Likert scale ranging from 1 = Only Chinese to 7 = Only Westerners (Cronbach's α = .93). Furthermore, we assessed their *Quality of Social Contact with Westerners* by asking them to rate their interactions with Westerners on four descriptors

[2] We also measured bilinguals' Length of Residency in Chinese-speaking Countries. However, since our bilinguals were all born in China and spent most of their lives there, we do not consider this variable as capturing meaningful variation in exposure to Chinese culture (i.e., its meaning systems and practices). Hence, we do not include this variable in our further analyses. Upon a reviewer's request, however, we re-ran all analyses including 'Length of Residency in English-speaking Countries' by replacing it with 'Length of Residency in Chinese-speaking Countries'. The latter variable yielded no significant effects and the pattern of results concerning the other variables did not change. Full details on these analyses can be obtained from the first author upon request.

("*Uncomfortable"*, "*Superficial*", "*Personal*", and "*Sincere*") each time using a scale ranging from 1 = not true at all to 7 = entirely true (Cronbach's α = .67). In a similar way, we also measured participants' *Quality of Social Contact with Chinese* (Cronbach's α = .93)

Finally, we also tapped into participants' acculturation attitudes and identities that are indices of people's *Explicit Cultural Affiliations* (Mesquita et al., 2019). Concretely, and for each cultural context (the UK and China), we created a composite score of three single-item measures referring to i) cultural identity ("*I identify with the [British/Chinese] culture*"); ii) attitudes towards cultural values and traditions *("It is important for me to maintain or develop the practices, values, and traditions of the [British/Chinese] culture");* and iii) interest in having social contacts *("I am interested in having [British/Chinese] friends").* All items were rated on a 7-point Likert scale (1 = Strongly Disagree; 7 = Strongly Agree) and the reliability of both the British (Cronbach's α = .73) and Chinese (Cronbach's α = .81) explicit cultural affiliations was acceptable.

Language Proficiency

For our exploratory analyses, we also wanted to assess the effects of English language proficiency. To do so, we assessed bilinguals' *Subjective English Language Proficiency* by asking them how they would rate their proficiency in listening, speaking, reading, and writing in English (items taken from the Bilingualism and Emotion Questionnaire; Dewaele & Pavlenko, 2001). Each subcomponent had to be rated on a scale ranging from 1 = Not at all; 7 = Perfectly. The scales had excellent internal consistency (Cronbach's α = .93).[3] In addition, we assessed bilinguals *objective*

[3] In a similar way, we also measured bilinguals' *Subjective Chinese Language Proficiency* (Cronbach's alpha = .92). However, since our Chinese English bilinguals all had Chinese as their L1, this variable is characterized by both a ceiling effect (*M* = 6.41) and not much variance (*SD* = .77; see OSM, Table B1). Hence, we do not include this

English proficiency by including the English-version LexTALE test (Lemhöfer & Broersma, 2012) in the 2019 wave of data collection. However, since this implies that only half of our bilinguals took this test and the results are not comparable with our other analyses, we only report on them in the Online Supplementary Materials (Appendix D).

Results

Analytic Strategy

In a first step, we assessed whether the three cultural groups had significantly different levels of emotional fit with the typically British and Chinese patterns (H1). This was done firstly with a repeated-measures ANOVA that included *Mean Emotional Fit* with the British and Chinese patterns as dependent variables and, secondly, with an ANOVA that included the *Mean Difference Score* in fit as DV. In both analyses, we predicted the DV(s) from participants' cultural group membership. Subsequently, we tested the effect of survey language on bilinguals' emotional fit (H2) by running a repeated-measures ANOVA including both *Mean Emotional Fit Scores* and an ANOVA including the *Mean Difference Score* as DV(s), and the survey language as a predictor. To assess the effect of survey language depending on bilinguals' level of cultural exposure (H3), bilinguals were categorized as high or low exposure to English-speaking countries, and the analyses described for H2 were repeated, with the

variable in our further analyses. Upon a reviewer's request, however, we ran an additionally series of exploratory SEM analyses including Subjective Chinese Proficiency as the predictor of interest (see below). However, this analysis yielded no significant effects of Subjective Chinese Language Proficiency. Full details on this analyses can be obtained from the first author upon request.

addition of this categorical exposure variable. Finally, structural equation modeling (SEM) was used in order to explore how different factors related to language and cultural engagement affect bilinguals' emotional fit. This was done because the correlation between the British and Chinese fit scores is rather high (see Table 1) and thus needs to be taken into account when estimating the effect of language and cultural engagement as predictors. Furthermore, SEM has the advantage of taking into account both the measurement error of indicator variables and the latent structure in our model. Specifically, we used the Latent Moderated Structural Equations (LMS) approach (Klein & Moosbrugger, 2000) that allows analyzing interaction effects involving latent variables with high statistical power (Cham et al.,2012). Table 1 includes the raw correlations between the main variables in the current study.

Table 1

Raw Correlations, Means and Standard Deviations of Main Variables among Bilinguals

	Variable	2	3	4	5	6	7	8	9	10	11	12	13	14	*M*	*SD*	*n*
1	Mean emotional fit with British culture	.86**	.03	-.02	.10	.08	.29**	.03	.23**	.03	.27*	.12	.00	.23**	.83	.40	178
2	Mean emotional fit with Chinese culture		-.48**	.03	.10	.13	.27**	.09	.23**	-.05	.24*	.11	.01	.19*	.84	.46	178
3	Difference score			-.10	-.02	-.12	-.02	-.13	-.06	.12	-.01	-.02	-.02	.02	-.01	.23	178
4	Length of Residency in the UK				.31**	.06	.00	-.01	.03	.30**	.07	.53**	-.06	.03	4.43	9.05	177
5	Quantity of Social Contact with Westerners					.25**	.00	-.11	-.14	.38**	.04	.14	-.03	.12	2.81	1.28	174
6	Quality of Social Contact with Westerners						.20**	.17*	.04	.43**	.18	.11	.07	.13	4.53	1.00	175
7	Quality of Social Contact with Chinese						.	.11	.36**	.16	.24*	.08	.14	.11	5.08	1.02	175
8	Explicit Cultural Affiliations (UK)								.25**	.10	-.09	.07	.00	-.13	4.59	1.20	176
9	Explicit Cultural Affiliations (China)									.13	.07	.04	.08	.16*	5.79	1.06	176
10	Subjective English language proficiency										.21	.38**	.17	.40**	5.26	.98	107
11	Objective English language proficiency											-.06	.08	.10	66.40	16.39	90
12	Age												-.08	.37**	30.34	10.03	176
13	Gender													.10	1.71	.46	178
14	Education Level														4.81	.79	178

Note. N = 178.

*p < .05, two tailed. **p < .01, two tailed.

Hypothesis 1: There are Group Differences in Emotional Fit

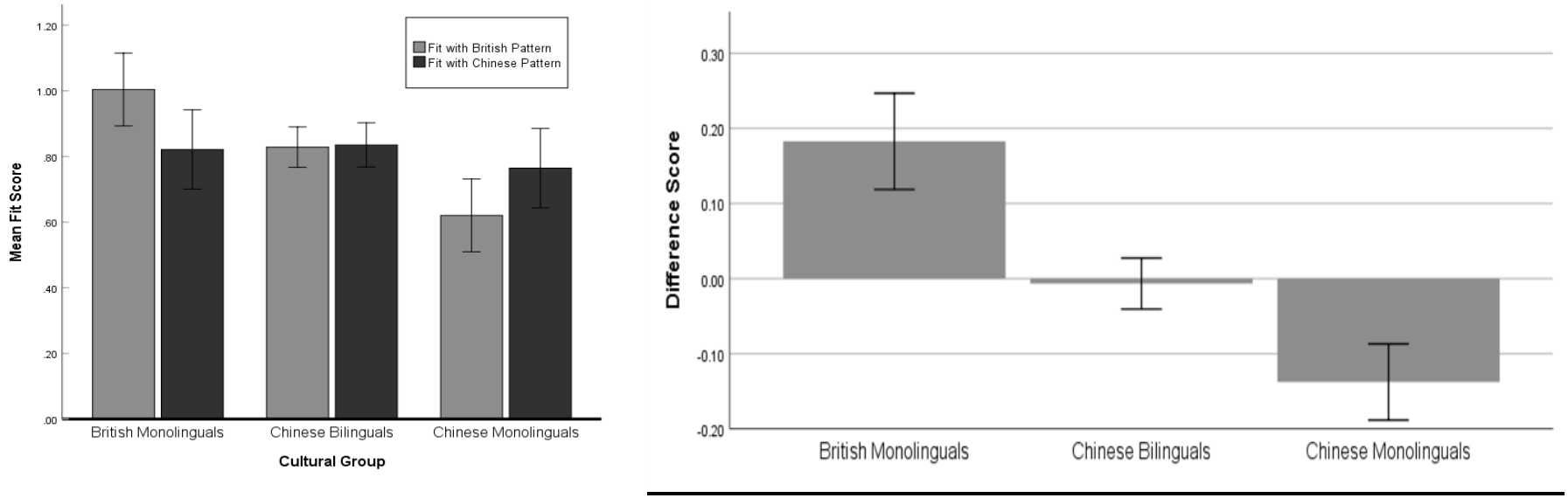
A prerequisite to further investigate the effects of language and cultural exposure or engagement on emotional fit, is that emotional fit levels differ across cultural groups in meaningful ways, that is, as a function of their general cultural exposure. To test this, we conducted a repeated measures ANOVA that included the *Mean Emotional Fit* score (i.e., average of fit in positive and negative situations) with the British and Chinese pattern as two dependent variables and Cultural Group (i.e., British monolinguals, Chinese monolinguals, Chinese bilinguals) as the predictor. As expected, there was no main effect of the within-subjects factor Type of Fit, but a significant interaction between Cultural Group and Type of Fit ($F_{(2,247)}$ = 18.49, $p \leq .001$ η_p^2 = .13). Planned pairwise-comparisons yielded that, as expected, British monolinguals had a significantly higher fit with the typical British pattern (*M* = .96, *SE* = .044) than the typical Chinese pattern (.80, *SE* = .05; M_{diff} = .16, *SE* = .03, $p \leq .001$, *CI* [.10; .22]), whereas Chinese monolinguals had a significantly higher fit with the typical Chinese (*M* = .90, *SE* = .06) than typical British patterns (*M* = .79, *SE* = .05; M_{diff} = -.12, *SE* = .03, *p* = .001, *CI* [-.18; -.05]). Chinese bilinguals fitted equally well with the typical British pattern (*M* = .88 *SE* = .03) and Chinese patterns (*M* = .89, *SE* = .03; M_{diff} = .01, *SE* = .02, *p* = .618, CI [-.04; .03]).

Looking from a different angle, these pairwise comparisons revealed significant differences in terms of emotional fit with the British patterns: British monolinguals scored highest, Chinese monolinguals scored lowest and Chinese bilinguals scored in between. Specifically, Chinese monolinguals had significantly lower fit with the typical British patterns than British monolinguals (M_{diff} = -.17, *SE* = .07, *p* = .009, *CI* [-.30; -.05) and marginally significant lower fit than bilinguals (M_{diff} = -.10, *SE* = .06, *p* = .082, *CI* [-.20; .01]); the difference in fit between monolinguals British and bilinguals did not reach significance, but was trending in the expected direction (M_{diff} = .08, *SE* = .05, *p* = .124, *CI* [-.02; .18]). However,

no significant differences were found in fit to the Chinese patterns, although the mean fit levels of each group were in the expected direction.[4] See Figure 1, left panel, for the full results.

Figure 1

Mean Fit Scores and Difference Scores for Different Cultural Groups



Note. The left panel shows the mean fit scores with British and Chinese patterns for each cultural group; the right panel shows the difference scores of the three cultural groups. Error bars show 95% CI.

[4] Follow-up analyses confirmed that this pattern of results held true across positive and negative situations. Full details on these analyses can be found in the OSM, Appendix B.

Further probing the cultural group differences in emotional fit levels with British and Chinese patterns, we conducted a one-way ANOVA with Cultural Group as the predictor of the Mean Difference Score in fit (i.e., fit with Chinese pattern subtracted from with British pattern). As can be inferred from Figure 1, right panel, the results showed a significant difference between the three cultural groups, $F_{(2,247)} = 18.49$, $p < .001$, $\eta^2 = .13$. Planned contrasts showed that the difference score of the British monolingual group ($M = 0.15$, $SE = .03$) was significantly higher than that of the Chinese monolingual group ($M = -.12$, $SE = .03$; $M_{diff} = .27$, $SE = .05$, $p <. 001$, CI [.18; .36]). The Chinese-British bilinguals' difference score fell in between ($M = -.01$, $SE = .02$) and differed significantly from both the British one ($M_{diff} = -.17$, $SE = .04$, $p <. 001$, CI [-.24; -.10]) and the Chinese one ($M_{diff} = .11$, $SE = .04$, $p =. 005$, CI [.03; .18]). Moreover, since the difference scores of both the British and the Chinese group differed significantly from 0 (British: $t_{(49)} = 4.97$, $p <. 001$, CI [.16; .22]; Chinese ($t_{(41)} = -4.41$, $p <. 001$, CI [-.17; -.06]), whereas this is not the case for bilinguals ($t_{(157)} = -.48$, $p = .63$, CI [-.05; .03]), monolinguals tend to fit significant better with their *own* cultural group's typical pattern of emotion while bilinguals tend to fit equally well with both groups.

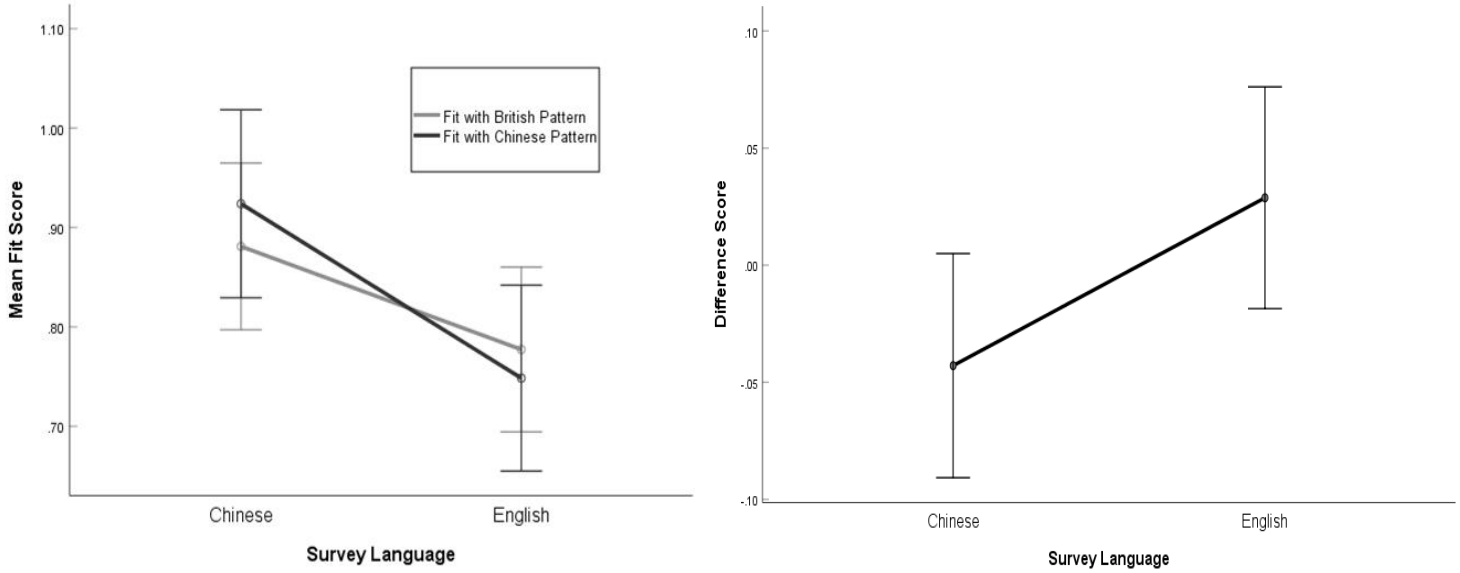
Hypothesis 2: The Survey Language Affects Bilinguals' Emotional Fit

To examine whether there was an effect of survey-language on bilinguals' fit with the typical British and Chinese emotional patterns, we first conducted a repeated-measures ANOVA in which we predicted the Mean Emotional Fit with Chinese and British patterns (i.e., average across fit in positive and negative situations) from whether bilinguals completed the survey in either English or Chinese. As expected, this analysis yielded no main effect of the within-subjects factor Type of Fit, but an interaction effect of Survey Language and Type of Fit ($F_{(1,156)} = 4.44$, $p = .037$ $\eta_p^2 = .03$). However, planned pairwise-comparisons revealed that there was only a marginally significant difference between bilinguals' fit with the

British and Chinese patterns when responding to the questionnaire in Chinese (M_{diff} = -.05, *SE* = .03, *p* = .071, *CI* [-.10; .00]). As expected, bilingual participants responding in Chinese fitted slightly better with the Chinese (*M* = .91, *SE* = .044) than with the British (*M* = .87, *SE* = .034) typical patterns of emotion. However, when responding in English, there was no significant difference in terms of fit (M_{diff} = .03, *SE* = .03, *p* = .243 *CI* [-.02; .08]), despite the mean levels of fit being in the expected directions (Fit with British pattern *M* = .90, *SE* = .04; Fit with Chinese pattern *M* = .87, *SE* = .05).[5] Please see Figure 2, left panel for a graphical representation of these findings.

[5] This effect was more outspoken for fit in negative than in positive situations. See OSM Appendix B for full details.

Figure 2: *Mean Fit Scores and Difference scores of Bilinguals Using Different Survey Language.*



Note. The left panel shows the mean fit scores with British and Chinese patterns; the right panel shows the difference scores. Error bars show 95% C

To probe this effect via the difference score of emotional fit (i.e., fit with Chinese pattern subtracted from with British pattern), we conducted an ANOVA in which we predicted bilinguals' Mean Difference Score from the language in which they had completed the survey. Confirming the idea that language may create differences in bilinguals' emotional patterns, we found a main effect of Survey Language ($F_{(1,156)} = 4.44$, $p = .037$, $\eta 2 = .03$). A planned contrast confirmed our expectation of frame switching by showing that those responding to the survey in English had a higher Difference Score ($M = 0.03$, $SE = .03$) than those responding in Chinese ($M = -.05$, $SE = .03$; $M_{diff} = .08$, $SE = .04$, $p = .037$, CI [.010; .15]). Whereas the Difference Score was significantly different from 0 when bilinguals reported in Chinese ($t_{(80)} = -2.02$, $p =$. 047, CI [-.09; .00]), this difference was in the predicted direction but did not reach significance when responding in English ($t_{(76)} = 1.07$, $p =$. 288, CI [-.03; .09]), suggesting that the differences between both emotional fit scores are more pronounced when responding in Chinese (see also Figure 2, right panel).

Hypothesis 3: The Effect of Survey Language Differs by Exposure

To investigate whether the effect of survey language depended on the level of cultural exposure of the bilingual participants – and thus to check if frame switching would be most outspoken for bilinguals with more cultural exposure –we had originally planned to treat cultural exposure as a continuous variable in our model. However, a frequency analysis of the variable "Length of Residency in an English-Speaking Country" revealed that 57% of participants had spent one year or less in such a country, implying that this variable was heavily skewed. Therefore, this variable was transformed into a dichotomous one, dividing the group of bilinguals into those that spent one year or less (≤ 1 year) in an English-speaking country

(Cultural Exposure = 0 = Low) and those that spent more than one year (> 1 year) in an English-speaking country and are thus more likely to be bicultural (Cultural Exposure = 1 = Higher).[6]

This dichotomous variable was then entered in a repeated-measures ANOVA that included both the British and Chinese Mean Fit scores as dependent variables and Survey Language as the second categorical predictor. This analysis replicated the effect of Survey Language on Type of Emotional Fit ($F_{(1, 153)}$ = 3,34, p = .070, η^2 = .02), but qualified it with a significant interaction effect of Survey Language and Cultural Exposure ($F_{(1, 153)}$ = 10,37, p = .002, η^2 = .06). Contrary to our prediction, planned Pairwise Comparisons revealed that bilinguals who had spent *1 year or less* in an English-speaking country (Cultural Exposure = low) were more susceptible to the effect of Survey Language on Type of Fit than bilinguals who had spent *more than 1 year* in an English-speaking country (Cultural Exposure = high). Specifically, bilinguals with *low* cultural exposure fitted significantly better with the typical Chinese emotional patterns (M = .94, SE = .05) than the British patterns (M = .86, SE = .04) when the survey language was Chinese (M_{diff} = .08, SE = .03, p = .011, CI [.02; .14]), but fitted significantly better with the typical British emotional patterns (M = .87, SE = .05) as compared to Chinese patterns (M = .76, SE = .06) when the survey language was English (M_{diff} = -.11, SE = .04, p = .004, CI [-.18; -.03]). In contrast, bilinguals with *high* cultural exposure fitted equally well (and consistently high) with both the typical British and Chinese patterns regardless of the survey language (see Figure 3, left and middle panels).[7] This finding is the opposite of what

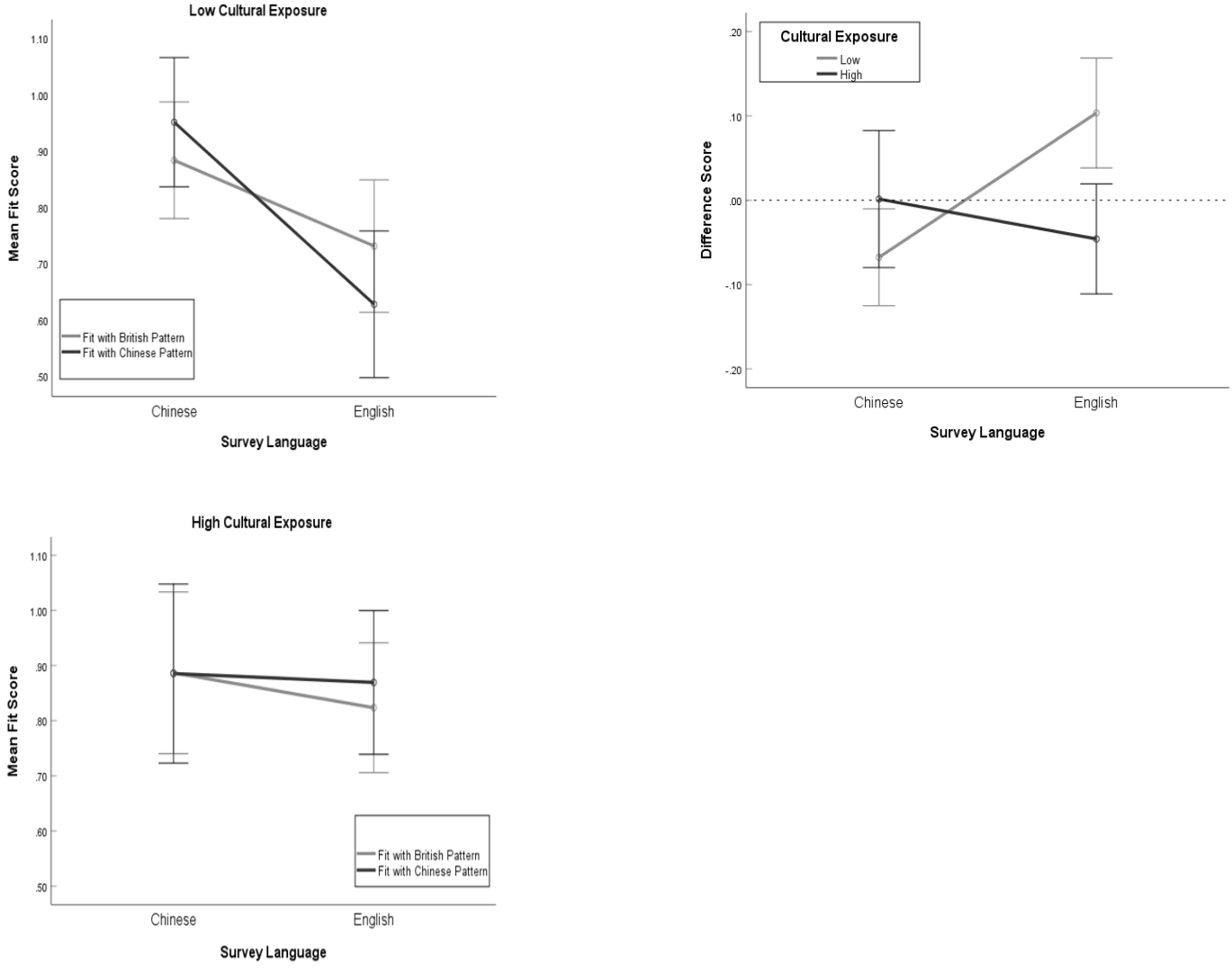
[6] Splitting up the sample slightly differently by setting the cut-off at *less than* one year (< 1 year) spent in an English-speaking country to be included in the Cultural Exposure = 0 = Low group (45% of the sample) and at 1 year or more (≥ 1 year) to be included in the Cultural Exposure = 1 = High group, did not change the directions of the effects reported here. Full details on these analyses can be obtained from the last author.

[7] This pattern of results held true across positive and negative situations, but the effects were most outspoken for the negative emotional situations. Full details on these analyses can be found in the OSM, Appendix B.

we had expected, namely that frame-switching would be most pronounced for bilinguals who have spent sufficient time in an English-speaking context to have internalized both cultural frames. However, it can be further understood by looking at these pairwise comparisons from a slightly different angle: Rather than being fully proficient frame-switchers who achieve similarly high levels of cultural fit when using both languages/frames, bilinguals with *low* cultural exposure to English-speaking countries encounter a serious drop in their emotional fit with Chinese patterns when taking the survey in English (M = .76, SE = .06) as compared to when taking it in Chinese (M = .94, SE = .05; M_{diff} = -.18, SE = .08, p = .034, CI [-.34; -.01]).

Figure 3

Mean Fit Scores and Difference Scores for Bilinguals with Low and High Cultural Exposure



Note. The left panel is the mean fit scores for bilinguals with low cultural exposure; the middle panel shows the mean fit scores for bilinguals with high cultural exposure; and the right panel is the difference scores for bilinguals with low or high cultural exposure. Error bars represent 95% CI.

This pattern of results was entirely replicated at the individual level by the univariate ANOVA including the Mean Difference Score as DV and Survey Language and Cultural Exposure as predictors. Just like the repeated measures variant, it yielded a marginally significant main effect of Survey language ($F_{(1, 153)}$ = 3,34, p = .070, η^2 = .02) that was qualified by a significant interaction effect of Survey Language and Cultural Exposure ($F_{(1, 153)}$ = 10,37,

p = .002, η^2 = .06). Again, bilinguals with *low* cultural exposure were more susceptible to the language of the survey so that their difference score was positive when responding in English (M = .11, SE = .04) and negative when responding in Chinese (M = -.08, SE = .03) – a difference that was highly significant (M_{diff} = -.18, SE = .05, $p \leq .001$, CI [-.28; -.09]). However, bilinguals with *higher* cultural exposure had a difference score that was close to 0 when responding in both English (M = -.04, SE = .03) and Chinese (M = .01, SE = .04), implying they fit both the British and Chinese patterns equally well regardless of the survey language (see also Figure 3, right panel).

Exploratory Analyses

To further understand the roles of linguistic and cultural factors in bilinguals' frame switching and to explore which factors could play a buffering role in the undermining of low-cultural exposure bilinguals' fit with the Chinese patterns when using English, we conducted a series of exploratory analyses. All these analyses explored how different cultural and linguistic factors relate to the different types of Mean Emotional Fit scores. We focus on the Mean Fit scores because, as can be inferred from Table 1, the Difference Score of Emotional Fit (column 3) did not correlate significantly with any of the other variables pertaining to bilinguals' language proficiency or cultural exposure. Yet, we cannot interpret the correlations between the Mean Fit Scores and other variables in Table 1 correctly because the correlations between emotional fit with the typical British and typical Chinese patterns are very high (r = .86). This was expected because it makes sense that the typical British and Chinese emotional patterns for positive (negative) situations are similar to a certain extent (e.g., higher intensity of positive emotions and lower intensity of negative emotions in positive situations). However, it implies that the interdependent nature of the British and Chinese emotional fit scores need to be taken into account for any exploration of the extent to which they are shaped by language proficiency or cultural engagement variables.

To overcome this issue, we used Latent Structural Equations Models (LMS; Klein & Moosbrugger, 2000) in Mplus 7.4. LMS can model both linear and nonlinear structural equations in a robust way (Umbach et al., 2017). Missing data in the model were estimated by the default full information maximum likelihood (FIML; Kline, 2005). Predictors of interest that consisted of multiple observed items (e.g., quality of Contact with Westerners) were considered latent variables. All predictors of interest and the Survey Language were treated as exogenous variables. To retain enough power (Bentler & Chou, 1987), we ran separate LMS models for predictors of interest that can be considered each other's counterpart (e.g., *Quality of Contact with Westerners* vs. *Quality of Contact with Chinese*). The to-be-predicted endogenous variables were participants' Mean Emotional Fit scores with the Chinese and British emotional patterns and, in a series of follow-up analyses, Positive Emotional Fit Scores and Negative Emotional Fit Scores respectively.

The LMS models were estimated in different steps (Klein & Moosbrugger, 2000; Muthen & Muthen, 2012). Firstly, we tested the effect of a certain 'predictor of interest' – for example, quality of contact with Westerners – on both outcome variables (Model 0), without including any control variables or the crucial moderator of this research, namely Survey Language. Subsequently, we ran a model (Model 1) in which we added crucial demographic characteristics, such as participants' gender, age, level of education, and length of residency in an English-speaking country, as additional predictors. We control for these factors since research has shown that female and lower educated participants encounter more difficulties to express emotions in the LX (Dewaele, 2018) and our analyses with regard to H3 revealed an effect of length of residency in English-speaking countries. Finally, we added Survey Language as well as its latent interaction term with the predictor of interest (Model 2). The interaction

variable was generated by using the XWITH command (Muthén & Asparouhov, 2015).[8] In total, we conducted six series of SEM analyses, pertaining to the five different types of cultural engagement variables (Quantity of Social Contact with Westerners, Quality of Social Contact with Westerners and Chinese, and Explicit Cultural Affiliations with the UK and China) and the language-related variable Subjective English Proficiency. Among all models, the covariance between Chinese and British emotional fit scores are set free.

Across most series of SEM analyses that predicted the Mean Emotional Fit Scores, we replicated the results of the repeated measures ANOVA's in regard to the Survey Language variable. Specifically, we found a significant main effect of Survey Language on Mean Emotional Fit with the Chinese patterns such that this fit was lower when responding to the questionnaire in English than in Chinese and a marginally significant effect on Emotional Fit with the British patterns. Interestingly, this pattern of results was much more outspoken for Emotional Fit in Negative Situations and quasi absent for Emotional Fit in Positive Situations, suggesting that responding in English mainly undermined bilinguals' emotional fit with the Chinese patterns in negative situations. We will not report on these findings in more detail here, but see the Online Supplementary Materials for the SEM models that predict emotional fit in positive and negative situations separately (see Appendix C, Tables C2 and C3). Across all models, the control variable 'Level of Education' had a consistent (marginal) positive effect on

[8] As the LMS method requires numerical integration, it is insufficient to estimate chi-square statistics or model fit statistics (e.g., Root Mean Square Error of Approximation (RMSEA), Comparative Fit Index (CFI), and Tucker-Lewis Index (TLI) that require means, variances, and covariances (Lodder et al., 2019). In other words, the interaction term should not influence the model fit statistics because it does not have means, variances, or covariances with other parameters (Muthen & Muthen, 2012). As a result, the Mplus software only reported Akaike information criterion (AIC; Akaike, 1974) and Bayesian information criterion (BIC; Schwarz, 1978). The smaller the information criterion is, the better the model is.

at least one of the mean fit scores – mostly on the fit with British patterns – which is in line with earlier work (Dewaele, 2018). Full details can be found in the OSM (Appendix C, Table C1).

Cultural Engagement Variables

The first series of SEM models that tested both the main effect of '*Quantity of Contact with Westerners'* and its interaction with Survey Language yielded no effects of the quantity of contact; only a negative impact of Survey Language on Emotional Fit with the Chinese patterns (B = -.18, p = .007) and a marginally significant negative impact of Survey Language on Emotional Fit with the British patterns (B = -.10, p = .090). Full details can be found in the Online Supplementary Materials (Appendix C, Table C1, Model A).

The second series, in which we tested the effects of *'Quality of Contact with Westerners',* revealed that the negative impact of the English survey language on Emotional Fit with the Chinese pattern (B = -.17, p = .007) could be buffered by having better quality interactions with Westerners. Specifically, there was a significant interaction effect between Survey Language and the Quality Contact with Westerners, such that a better quality of contact positively impacted both the Fit with the British (B = .26; p =.036) and Chinese (B = .29; p = .027) patterns (see OSM, appendix C, Table C1, Model B for the full results).

The third series, in which we tested the effects of *'Quality of Contact with Chinese',* revealed that the negative impact of the English survey language on Emotional Fit with the Chinese pattern (B = -.15, p = .017) could also be buffered by having better quality interactions with Chinese. Specifically, there was a significant interaction effect between Survey Language and the Quality of Contact with Chinese: the better the quality of contact with heritage members, the higher was bilinguals' Fit with the Chinese patterns (B = .21; p = .010; see OSM, appendix C, Table C1, Model C for the full results). Taken together, this pattern of results suggests that

a one scale-point increase on either the Quality of Contact with Westerners scale (1-7) or the Quality of contact with Chinese scale could totally 'erase' the negative impact of the English Survey Language on bilinguals' Fit with the Chinese patterns.[9]

Finally, we ran two series of analyses in which we investigated the pathways for bilinguals' *Explicit Cultural Affiliations* with both the British and Chinese cultures. The one that included bilinguals' Explicit Affiliations with the British culture, did not yield any significant results (see OSM, Appendix C, Table C1, Model D). The one that included bilinguals' Explicit Affiliations with the Chinese culture, however, showed that the negative impact of the English Survey Language on Emotional Fit with the Chinese patterns (B = -.17; p =.011) could be buffered by endorsing more Explicit Affiliation with the Chinese Culture (see OSM, Appendix C, Table C1, Model E). Specifically, the significant interaction effect between Survey Language and Chinese Affiliation on the Fit with the Chinese patterns (B = .17; p = .018) implies that the negative impact of survey language on Fit with the Chinese patterns can be mitigated by one scale-point increase on the Explicit Chinese Affiliation scale (1-7).[10]

Language Proficiency

The sixth series of SEM models in which we tested for the main effect of *Subjective English Language Proficiency* and its interaction with Survey Language, showed no effect of Proficiency; it only yielded a significant main effect of English Survey Language on emotional Fit with the Chinese patterns (B = -.15; p = .034). Full details can be found in the OSM (Appendix C, Table C1, Model F).

[9] This pattern of results was most outspoken in positive emotional situations (see OSM, Appendix C, Table C2, Models B and C), yet absent for negative situations (see OSM, Appendix C, Table C3, Models B and C).

[10] Again, this pattern of results was most outspoken in positive emotional situations (see OSM, Appendix C, Table C2, Models D, E), yet absent for negative situations (see OSM, Appendix C, Table C3, Models D, E).

Discussion

This study aimed to shed light on the extent to which language and culture shape people's emotional experiences. Specifically, and by relying on the frame-switching paradigm, we investigated how language use and proficiency, as well as cultural exposure and engagement, contribute to shaping Chinese English bilinguals' fit with the typically British and Chinese patterns of emotion. We found that whereas monolingual participants fitted better with the patterns of emotion of their *own* cultural group than those of the *other* cultural group, bilingual participants fitted both the English and Chinese patterns equally well (H1). Moreover, the fact that bilinguals' fit scores with the typical British patterns are situated between those of British and Chinese monolinguals, suggests emotional acculturation towards these British patterns. Similar patterns have been observed for linguistic and cognitive variables (Cook, 2012). Together, these finding suggests that – at least at the group level – cultural exposure and engagement are shaping people's emotional patterns and according fit with culture. Unexpectedly, however, the three cultural groups did not differ from one another in their fit with the Chinese patterns; we can only speculate why this is the case and await further replications to draw any conclusions based on this finding.

Concerning the role of language, our experiment further showed that the survey language mattered: Bilinguals responding in Chinese fitted better with the typically Chinese than the typically British emotional patterns whereas the opposite was true when responding in English (H2). Importantly, however, this language effect was qualified by an interaction between cultural exposure and survey language, yielding the opposite pattern of what we had predicted (H3): Bilinguals with *low* cultural exposure (i.e., *less* than one year in an English-speaking country) were *more* susceptible to the language of the questionnaire than those bilinguals with *high* cultural exposure.

By further scrutinizing this finding, we found that the bilinguals with low cultural exposure were not truly frame-switching (i.e., fitting equally highly with both of the cultural patterns as a function of the language cue); they rather encountered a *drop* in fit when reporting on emotional situations in English. This finding is actually in line with many applied linguistic studies that reported that bilinguals with low cultural exposure can struggle to express their emotions in the LX and feel more nuanced, sophisticated, and confident – and, as we showed here, more culturally attuned – when doing so in their first language (L1). In her biography (1989), Hoffman, once a Polish immigrant-teenager to Canada and former editor of *The New York Times,* describes this struggle to express herself in the LX as follows: "I am enraged at the false persona I'm being stuffed into, as into some clumsy and overblown astronaut suit. I'm enraged at my adolescent friends because they can't see through the guise, can't recognize the light-footed dancer I really am" (pp. 118-119). Therefore, like Hoffmann, multilinguals typically prefer to express their emotions in their L1 (Dewaele, 2013) but also occasionally report a feeling of alienation when discussing emotions in the LX (Panicacci & Dewaele, 2017, 2018) as LX emotion words often feel disembodied (Caldwell-Harris, 2014). However, the LX can be helpful when reporting trauma that happened in the L1 (Rolland, Costa & Dewaele, 2020).

The Importance of High-Quality Contact and Heritage Affiliation

Further support for this interpretation is situated in our exploratory analyses that tested how the quantity and quality of bilinguals' interactions with Westerners and Chinese, their explicit cultural affiliations, and their subjective English language proficiency interplayed with the survey language in shaping their emotional fit. Firstly, these analyses showed that the negative impact of using English on emotional fit with the Chinese patterns was mitigated, and their fit with the British patterns was improved if bilinguals had high-quality interactions with Westerners. It is likely that these interactions – which are likely interactions with friends or

romantic partners in an LX – allowed bilinguals to share emotional situations (Rimé, 2009), which provides the opportunity to negotiate the meanings of LX emotion words and to acquire emotional resonance as part of the conceptual restructuring in the LX (cf. Dewaele & Salomidou, 2017; Pavlenko, 2009). In a similar way, bilinguals' high-quality contacts with Chinese may be like an umbilical cord with the heritage culture, allowing them to maintain the Chinese emotional patterns despite being immersed in another language and culture. Thus, high-quality interactions with both majority members (Jasini et al., 2018, 2020) *and* heritage culture members (De Leersnyder et al., 2020) may be key to emotional fit with culture and help bilinguals overcome the initial struggles they encounter when communicating emotions in the LX.

Secondly, these analyses showed that neither bilinguals' number of contacts with Westerners nor their self-reported English language proficiency could buffer the negative impact of using English on emotional fit. This suggests that merely becoming proficient in an LX or having contact with people who are native LX-speakers is not sufficient to acquire the deep, nuanced, and sophisticated meanings associated with LX emotion concepts that are necessary to fit both the typical LX-cultural patterns of emotion and the heritage culture patterns when using the LX to express emotions. Rather, bilinguals need meaningful social interactions with native L1 and LX-users with whom they may share emotional episodes and, in doing so, establish common ground on the meanings of emotional situations (Dewaele & Salomidou, 2017).

Finally, the exploratory analyses showed that the negative impact of using English on bilinguals' fit with the Chinese patterns was buffered if their explicit affiliation with the Chinese culture was stronger. This suggests that people with stronger heritage culture affiliations fit better emotionally with heritage culture patterns even when speaking an LX that might prevent fully expressing themselves. Further research on this issue is needed, since the

current findings on the associations between immigrant minorities' explicit cultural affiliations and emotional fit with their heritage culture contrast those of earlier studies (De Leersnyder et al., 2020).

Limitations and Future Research

The current study is not without its limitations. Firstly, 58% of our bilingual sample had spent less than one year in the country of the LX, and only 11% had spent more than ten years in the LX-country. This prevented us from investigating the effects of language use/proficiency and cultural exposure/engagement on frame switching in bilinguals who were more likely to internalize the new mainstream culture in addition to their heritage culture. Secondly, and despite the fact that bilingual participants were randomly assigned to the survey language, the between-subjects design of our study limits conclusions of the cultural shaping of language use on emotional fit – in an ideal scenario, bilinguals would respond to the same emotional situations twice in different languages. Thirdly, since research has shown that bilinguals with lower scores on Emotional Stability, Flexibility, and Open-mindedness may encounter more difficulties to express emotions in the LX (Dewaele & Salomidou, 2017), future studies may want to investigate (and control for) these personality traits. Finally, and as both qualitative and quantitative studies within the field of applied linguistics show that multilinguals exhibit subtle linguistic and cognitive differences from monolingual speakers of their language (Cook, 2012), they may also communicate their emotions in unique ways (Dewaele, 2016). Hence, bilinguals may create (and sometimes come to share) unique 'third' cultures that exhibit emotional patterns that are different from the typical patterns of their monolingual reference

groups (Kramsch, 2009). As a consequence, it may be worthwhile to study the exact *contents* of their emotional patterns in addition to studying their emotional fit.[11]

Conclusion

Bilinguals' emotional fit with their LX and L1 cultures is shaped by both the language they use as well as their cultural exposure and engagements. Highlighting the importance of culture, monolinguals fitted best with the emotional patterns of their own culture and, bilinguals' fitted about equally well with both the LX and L1 typical emotional patterns. Stressing the role of language, bilinguals' emotional fit was affected by the survey language; but, since these effects could not be explained away by linguistic proficiency, emotional fit with culture is *not* a linguistic artifact. Rather, bilinguals' language use interacted in various ways with cultural engagement factors, pointing to the importance of high-quality social interactions in both the heritage and new mainstream context for LX users to overcome the challenges of expressing themselves and achieving cultural fit. In sum, language and culture interactively shape people's emotional experience. Hence, they should not be situated at the periphery of emotional experience but rather at its core.

Additional Information

Acknowledgement We wish to thank YongQi Cong (University of Amsterdam) for translating the questionnaires from English into Chinese.

Author Contribution CZ, CO, JMD and JDL designed the study and developed the materials; CZ and CO collected the data under supervision of JMD; CZ and JDL analyzed the data; CZ prepared all Tables,

[11] On the basis of the current data and analyses, however, we have no reason to suspect that the content of bilinguals' emotional patterns would be completely independent of those that are typical for their respective heritage and new mainstream cultural contexts: Bilinguals fit about equally well and, importantly, relatively highly with both of these cultural typical patterns (cfr. results of H1).

Figures and OSM; CZ wrote the first draft of this manuscript; JDL rewrote the manuscript while JMD commented and added to it.

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Data Availability All data, syntax, code, and materials can be found here: https://osf.io/se9wn/. The current research was not officially preregistered, but a date-stamped analysis plan prior to any analyses was created as part of course fulfillments at the University of Amsterdam by the first and third authors.

Conflict of Interests The authors declare that they have no conflict of interest.

Ethical Approval Ethics approval was obtained from the Ethics Committee of the Psychology Department of the University of Amsterdam (2018-SP-8848). The study was performed to ethical standards as laid down in the 1964 Declaration of Helsinki, and all participants received and signed an Informed Consent prior to taking the survey.

Informed Consent All participants provided informed consent prior to participation.

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