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Mandarin Speakers' Perception of Accented L2-English: The Effects of Accent, Linguistic Experience, and L2 Proficiency

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Research Article

Mandarin speakers' perception of accented L2-English: The effects of accent, linguistic experience, and L2 proficiency

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Abstract

In much previous research, language listeners were found to perform differently when listening to a second language (L2) spoken in foreign/native accents. Influential factors have not been ascertained. This study aimed to gain new insights into this issue. 82 Mandarin speakers of different L2 (English) proficiency and different degrees of familiarity with Cantonese, Thai, and Yorkshire accent participated in the study. The stimuli were 40 English sentences with a noun as the last word (stimulus word). The stimulus words were gated with gate 0 revealing no phonological information, gate 1 displaying the first 40 *ms* of it, gate 2 having an additional 40 *ms*, etc., accumulating until the end of the word was revealed. The sentences were spoken in the accent of Mandarin, Yorkshire, Cantonese, and Thai. The participants were asked to write down the stimulus words each time after they heard a gated sentence. The results indicated that the participants required significantly less phonological information to correctly recognize the stimuli spoken in their own and Yorkshire accent than in Thai and Cantonese accent. Moreover, the participants' degree of familiarity with the accents and their L2-English proficiency both had a significant effect on their perceptual performance.

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Mandarin konuşucularının aksanlı İngilizce algısı: Aksan, dilbilimsel deneyim, ve İngilizce yeterlilik düzeyinin etkileri

Öz

Yapılan birçok araştırma dinleyicilerin yabancı bir dili yerli ya da yabancı bir aksandan dinlerken, dinleme performanslarının farklılık gösterdiğini ortaya koymuştur. Ancak bu durumu etkileyen faktörler tam olarak ortaya konulamamıştır. Bu çalışmanın amacı bu duruma ilişkin yeni anlayışlar edinmektir. İngilizceyi yabancı dil olarak konuşan farklı yeterlilik düzeylerine sahip ve Kantonca, Tayca ve Yorkshire aksanlarına farklı düzeylerde yakınlığı olan katılımcılardan oluşan 82 Mandarin konuşucusu bu çalışmada yer almıştır. Uyaranlar, son kelimesi *ad* (uyaran kelime) olan 40 adet İngilizce cümleden oluşmaktadır. Çalışma, söylenen kelimeleri tanımaya ilişkin süreci irdeleyen *gating paradigm* yöntemine göre tasarlanmıştır. Cümleler Mandarin, Yorkshire, Kantonca ve Tayca aksanlarında konuşulmuştur. Katılımcılardan bir *gated* cümle duyduktan sonra her seferinde uyaran kelimeleri yazmaları istenmiştir. Araştırma sonucunda, konuşmacıların Kantonca ve Tayca aksanlarında söylenen cümlelere nazaran kendi aksanlarında ve Yorkshire aksanında söylenmiş uyaranları doğru bir şekilde anlayabilmeleri için çok daha az fonolojik bilgiye gereksinim duydukları ortaya çıkmıştır. Ayrıca, katılımcıların bu aksanlara olan yakınlıkları ve yabancı dil olarak İngilizce yeterlilik düzeylerinin, algısal performanslarında anlamlı bir etkiye sahip olduğu ortaya çıkmıştır.

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05 Mart 2018

Anahtar kelimeler
algı
aksan
İngilizce
Mandarin
Kantonca
Tayca

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Introduction

Foreign-accented speech refers to non-pathological speech that is different from native speakers' pronunciation in some noticeable respects (Munro & Derwing, 1995). Due to the influence of their native language (L1), non-native speakers are frequently found to speak a second language (L2) with foreign accents (Best, 1994; Best & Strange, 1992; Flege, 1992a, b). To accurately perceive foreign-accented speech, particularly unfamiliar foreign-accented speech, listeners must be able to contend with speech productions that differ from their previous experience in terms of segmental and/or suprasegmental features (e.g. Clopper & Smiljanic, 2015; Clopper, Psoni, & de Jong, 2005; Sereno, Lammers, & Jongman, 2016). Differences between native and non-native speakers' phonetic perception of speech signals suggest that adult L2 learners may often employ their L1 phonological system in the perception of L2 sounds (Best, 1994; Bent & Bradlow, 2003; Flege, 1992a, b; Iverson et al., 2003; Leather, 1999; Major, 1999; Werker, 1994). Consequently, they may have difficulties or display increased processing time in the perception of phonetic segments, words, or larger units of foreign-accented speech (Flege, 1988; Munro & Derwing, 1995).

Leikin, Ibrahim, Eviatar and Sapir (2009) tested L2-Hebrew listeners' ability in the perception of Hebrew words spoken with an accent like their own, a native Hebrew accent, and foreign accents. It turned out that the listeners required significantly more phonological information for the perception of the stimuli spoken with other foreign accents than with an accent like their own. Similarly, Hendriks, Meurs and Groot (2015) investigated 178 adult French, German and Spanish speakers' perception of a text spoken in French, German, and Spanish by native speakers of the languages and by Dutch speakers with strong and slight Dutch accent. The data revealed that the degree of accentedness had a significant effect on understanding the stimulus text. Furthermore, a speaker with a strong Dutch accent in French, German or Spanish was evaluated as less friendly and less competent than a speaker with a slight Dutch accent. However, some studies hold different views regarding the impact of accents on listeners' perception of speech sounds. In 1970, Gimson argued that accurate production of English consonants is more essential to comprehension than native-like production of English vowels. Findings from Munro and Derwing (1995) also failed to reveal a relationship between strength of accent and the time required to process accented speech. It was also found that listeners could both adapt rapidly to unfamiliar speakers and accents (Clarke & Garrett, 2004; Bradlow & Bent, 2008; Sidaras, Alexander & Nygaard, 2009). Moreover, Lee, Vakoch and Wurm (1996) investigated Cantonese, Mandarin and English speakers' perception of Cantonese and Mandarin tones. Although both Cantonese and Chinese speakers performed better at discriminating tones of their own language, almost no difference was found between Mandarin and English speakers at discriminating Cantonese tones, despite the fact that Mandarin and Cantonese share some features in their tone systems (Lee, Vakoch & Wurm, 1996). Similarly, Li (2015) revealed that both English and Thai speakers had very similar degrees of difficulty in the perception of Tone-2 and Tone-3 in Mandarin, though the tone systems of Mandarin and Thai are similar to each other.

The inconsistent findings discussed above may, to some extent, be explained by the listeners' linguistic experience. Typically, listeners' linguistic experience with a foreign accent predictably facilitates their recognitions of L2 sounds (Hanulíková & Weber, 2012). For

instance, Adank, Evans and Stuart-Smith Scotti (2009) compared 24 adult native English speakers' processing time in the perception of English sentences, which were spoken with a familiar accent, an unfamiliar native accent, and a non-native accent. A semantic verification task was carried out. The results indicated that the response time was modulated by the relative familiarity of the participants with the native accent. The processing time associated with the non-native accent was larger than with the unfamiliar native accent (Adank et al., 2009). In Leikin et al. (2009), the stimuli spoken with native Hebrew accent were found to require similar amount of phonological information to stimuli spoken with the listeners' own accent. It was explained by the listeners' language experience with native Hebrew accent (Leikin et al., 2009). Similarly, the English and Thai participants in Li (2015) had no linguistic experience with Mandarin. More similar findings are available from Rogers, Dalby and Nishi (2004), van Wijngaarden (2001), Schmid and Yeni-Komshian (1999), Munro and Derwing (1995, 1999), Adank and McQueen (2007), and Floccia, Goslin, Girard and Konopczynski (2006). Moreover, language listeners' proficiency level of a foreign language may also play a role in their perception of the language spoken with native accents. Unfortunately, there is a lack of research findings on this issue.

Prior studies on foreign language perception in general suggested that greater proficiency is positively associated with better perception of foreign language (Vandergrift, 2005; Best & Tyler, 2007). On the whole, the influence of the presented accents, linguistic experience, and proficiency level of the target foreign language on their perception of the accented speech, which is theoretically and practically significant for phonological development, has not been ascertained.

In the present study, the participants with higher L2-English proficiency levels, according to Oxford Quick Placement Test results, were predicted to perform better than those with lower proficiency levels in the perception of accented English. Therefore, the study addresses three research questions to gain new insight into the influence of accent, linguistic experience, and English proficiency on their perception of accented English.

1. What effect does accent have on the Mandarin speakers' perception of accented L2-English?
2. What effect does the Mandarin speakers' linguistic experience with the target accents have on their perception of accented L2-English?
3. What effect does the Mandarin speakers' L2-English proficiency have on their perception of accented L2-English?

Methodology

This study investigated L1(Mandarin) of L2(English) speakers' accuracy in the perception of accented/nonaccented English speech with a gating paradigm. The sentences were spoken in the accent of Mandarin, Yorkshire, Cantonese, and Thai. The participants were asked to write down the stimulus English words of Mandarin, Yorkshire, Cantonese, and Thai accents, in order to gather the amount of phonological information that the participants needed in the perception of different accented English words.

Participants

82 university students with normal speech and hearing aged from 18 to 22 years volunteered to participate in the study (mean age=18.44; 48 female; 34 male). All of them were L1-Mandarin of L2-English speakers. They were non-English majors but doing English for extra credits. The background information of the participants, such as English proficiency levels (measured by Oxford Quick Placement Test), degree of familiarity with Cantonese, Thai, and Yorkshire accented English were collected with questionnaires.

Procedures

A questionnaire partially adopted from Li (2017) was employed to gather the information on the participants' language background, such as years of L2-English learning, degrees of familiarity with Cantonese, Thai, and Yorkshire accents.

The stimuli were similar to those used in Leikin et al. (2009). Specifically, 40 English sentences were prepared for the perception test. The sentences were constructed such that the last word was a noun (e.g., When Mary left for, her mother asked her to bring the ….. puddings/bins/pens/bears). Each sentence was paired with four different ending words—the gated words, which were equated on their predictability[1]. The stimulus sentences were recorded by a native Mandarin, Cantonese, Thai, and English (Yorkshire accent) speaker, with 10 sentences in each of the four accents. The reason to choose Cantonese and Thai accent was because there were many international students from Hong Kong, Thailand and Europe at the university where the study was carried out. Thus, it was assumed that some of the participants would have some experience with these accents. As for Yorkshire accent, it is quite close to Received Pronunciation (RP), or what is called Standard English pronunciation. The stimuli were recorded using a high quality recorder (Roland-05) with the settings: 16-bit mono channel and 44.1 KHz in a sound treated room. The recorded sentences were digitized with Avaaz Inovations, Inc., CSRE4.0. Following Grosjean (1980), each sentence was constructed with gate 0 revealing no phonological information of the stimulus word, gate 1 having the first 40 ms of the word, gate 2 revealing an additional 40 ms, etc., accumulating until the whole word was revealed. The stimuli were presented using a laptop with a speaker at a comfortable loudness level.

Ten native English speakers (5 male, 5 female) who were doing their Master's degrees in the UK were asked to identify the accent type (Cantonese, Thai, and Mandarin) and to indicate the accent degree of the speakers with a 5 Likert scale (0=no foreign accent, 5=very strong accent) as well as voice characteristic (0=very unpleasant, 5=very pleasant). Because of their learning environment, all the listeners reported to have the experiences of dealing with Cantonese, Thai, and Mandarin speakers. A repeated measures ANOVA did not reveal a significant main effect of identification of accent type, accent degree, or voice characteristic ($p>0.05$). Moreover, the accent type of all the stimuli were correctly identified without significant main effect of group.

[1] A pilot study was carried out to help choose the gated words of equal predictability.

One week before the perception test, the participants were asked to do an Oxford Quick Placement Test for the purpose of finding out their English proficiency levels[2]. The test was carried out at the beginning of a lecture (English literature) in a quiet classroom. The students were told that they could drop out at any time during the study if they wanted (none of them dropped out though). They were asked to do a perception test by listening to the recordings and write down the last word of each gated sentence on an answer sheet, even by guessing. After the perception test, the students were asked to complete the questionnaire, which were collected after being completed.

Findings

As shown in Figure 1, Figure 2, and Figure 3 below, the participants had been learning English as a foreign language for 6 to 13 years. The majority of their English proficiency levels were lower intermediate (B1, n=37) and upper intermediate (B2, n=27). There were more participants reported to be familiar with Cantonese and Thai accents than those with Yorkshire accent.

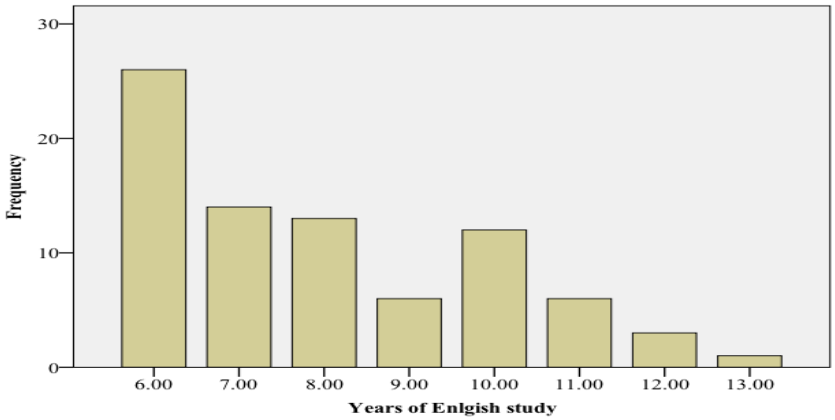

Figure 1. The participants' years of English learning (in years)

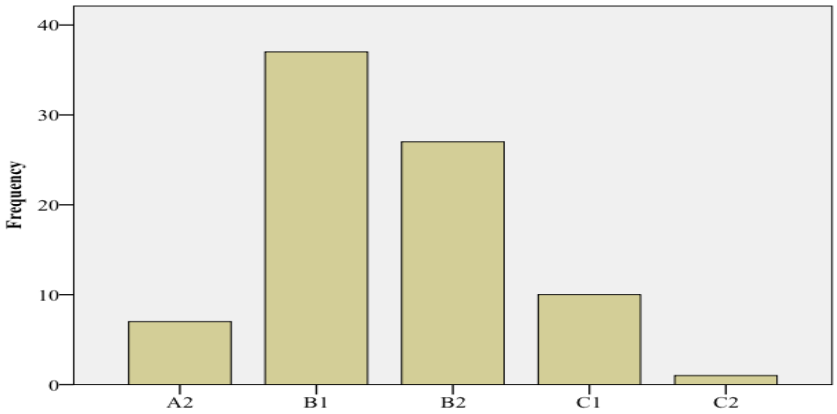

Figure 2. The participants' levels of English proficiency (in percentage)

[2] English proficiency levels: A1=beginner, A2=elementary, B1=lower intermediate, B2=upper intermediate, C1=advanced, C2=very advanced

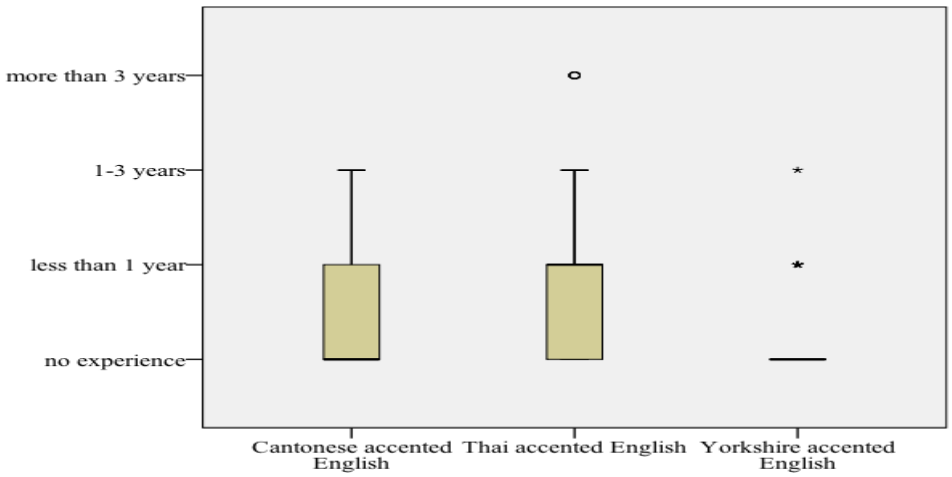

Figure 3. The participants' experience with Cantonese-, Thai-, and Yorkshire-accent

The proportion of the phonological information from the stimulus word that was needed to identify it correctly three times in a row (in ms) was calculated in this way: (the value of the gate at which the target word was recognized correctly the third time)*40 ms/(the total length of the word). As shown in Figure 4 and Table 1 below, the participants needed the largest amount of phonological information in the correct recognition of Thai-accented English (average=0.46 ms), while comparatively less in the correct recognition of Cantonese-accented English (average=0.42 ms). Much less phonological information was required for the perception of Mandarin-accented (average=0.38 ms) and Yorkshire-accented English (average=0.39 ms).

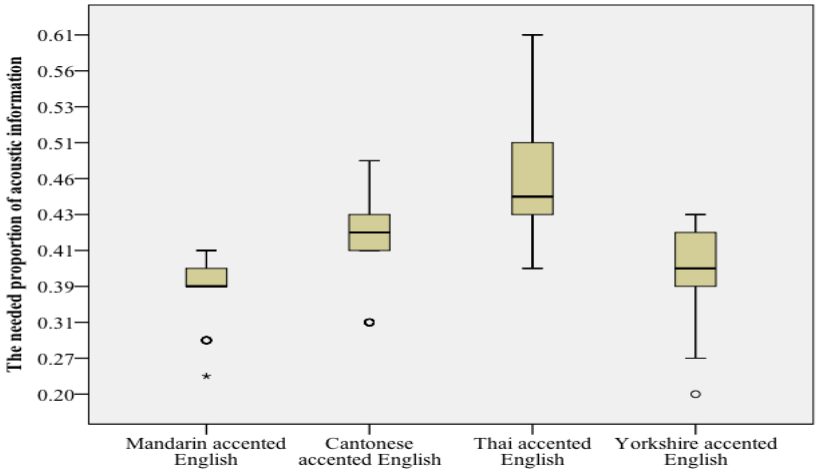

Figure 4. The proportion of phonological information that the participants needed for the correct identification of the stimulus words

Table 1. Estimates of the phonological information that the participants needed for the accurate identification of the stimuli

Presented accent	Mean	Std. Error	95% Confidence Interval	
			Lower Bound	Upper Bound
Mandarin	.376	.05	.367	.386
Cantonese	.417	.18	.404	.430
Thai	.463	.16	.452	.475
Yorkshire	.389	.07	.378	.399

Table 2. Post Hoc test results of the participants' perceptual performance

(I) accent	(J) accent	mean difference	Sig
Mandarin	Cantonese	-0.041	**0.000**
	Thai	-0.087	**0.017**
	Yorkshire	-0.013	0.341
Cantonese	Mandarin	0.041	**0.000**
	Thai	-0.046	0.218
	Yorkshire	0.028	**0.021**
Thai	Cantonese	0.046	0.218
	Mandarin	0.087	**0.017**
	Yorkshire	0.074	**0.015**
Yorkshire	Thai	0.074	**0.015**
	Cantonese	-0.028	**0.021**
	Mandarin	0.013	0.341

Repeated measures ANOVA was carried out to detect the effect of the presented accents and other relevant factors on the participants' perceptual performance. The accent of English in which the stimuli were presented (Mandarin, Cantonese, Thai, and Yorkshire) was coded as a within-subjects variable. The participants' degree of familiarity with the target accents, for how long they had been learning English, levels of English proficiency, age, gender, as well as their levels of English proficiency were coded as between-subjects factors. The amount of phonological information that the participants needed for the correct recognition of the gated words were coded as the dependent variable.

According to the results mentioned above, the accent of English in which the stimuli were presented (*accent* thereafter) had a significant effect on the participants' perceptual performance ($F(3, 189)=57.31$, $p<0.001$). As mentioned above, the participants needed larger amount of phonological information for the correct perception of Thai- and Cantonese-accented English than Mandarin- and Yorkshire-accented English. Further analysis with *Post Hoc Test* (Table 2) indicated that the significant mean differences lied in Mandarin-Thai, Mandarin-Cantonese, Yorkshire-Thai, and Yorkshire-Cantonese. The rest of the mean differences turned out to be nonsignificant.

Given that Mandarin was the participants' L1, their degree of familiarity with Mandarin was coded as "more than 3 years" for statistical analysis on the association between

the participants' degree of familiarity and the amount of phonological information they needed for the accurate perception of the stimuli. Chi-square test in Crosstabs indicated that the association was nonsignificant (p=0.072). This finding seemed to be at odds with Figure 3 and Figure 4. Considering that the text books (including recordings) used in China followed British English, the participants would be quite familiar with RP. It is generally accepted that Yorkshire accent is close to RP. Therefore, we excluded data on the participants' degree of familiarity with Yorkshire accent, and conducted Chi-square test again with data on the participants' degree of familiarity with Mandarin, Thai, and Cantonese accents. It turned out that the association was significant (p<0.001, *Symmetric Measures*=0.615).

Moreover, the participants' levels of English proficiency (F(3, 34)=10.94, p=0.003) and its interaction with the presented accents (F(4, 34)=9.54, p=0.004) were both found to have had a significant effect on the participants' accurate perception of the gated words. The rest of the factors and their interaction with each other, however, because of the participants' perceptual performance (p>0.05).

So far, the three research questions were answered with the findings above. That is, the accents in which the stimuli were produced, the participants' linguistic experience with the target accents, as well as their English proficiency all had positive strong association with their accurate perception of the accented L2-English speech.

Discussion

The first finding of the present study was that the variable *accent* displayed a significant effect on the participants' perception of L2-English. Specifically, the participants required the least amount of phonological information for L2-English perception when it was spoken in Mandarin accent. This finding was consistent with the prediction that L2 listeners may employ L1 phonological system for L2 perception (Best, 1994; Bent & Bradlow, 2003; Flege, 1992a, b; Iverson et al., 2003; Leather, 1999; Major, 1999; Werker, 1994). Consequently, less processing time was required when it is spoken in their L1 accent than it was spoken in other foreign accents. Nonetheless, Lee, Vakoch and Wurm (1996) and Li (2015) found that even if a foreign language shares some features with listeners' L1, the listeners still present some difficulties in the accurate perception of the foreign-language-accented speech of an L1. What makes the two studies different from the present one is that these studies mentioned above highlighted only the perception of tones. However, as the target L2 in the study, English is not a tonal language.

The second finding was that there was not a significant difference between the amount of phonological information that the participants needed to accurately perceive Mandarin-accented and Yorkshire-accented English. It was similar to the finding in Leikin et al. (2009) in which native-accented speech did not pose any additional difficulties for perception. Nevertheless, it was at odds with some previous studies, which suggested that speech perception of L2 would be easier for L2 learners when its phonemic features are similar to that of their L1 than when they are native-like (e.g. Best, 1994; Iverson et al., 2003; Major, 1999). However, the English textbooks used in public schools/universities and the majority of private English learning schools in China are following the British syllabus. Therefore, even if the majority of the participants reported to have little/no exposure to Yorkshire accent, their

experience with RP might have facilitated their perception of Yorkshire-accented English. In fact, this conjecture was confirmed with Chi-square test on the strong association between the participants' degree of familiarity with the target accents and the amount of phonological information they needed for L2-English perception. As shown in Figure 4, the participants needed the largest amount of phonological information in the correct recognition of Thai accented English, while comparatively less in the correct recognition of Cantonese accented English. Much less phonological information was required for the perception of Mandarin-accented and Yorkshire-accented English. Given that Mandarin was their L1, there would be doubts on their familiarity with Mandarin-accented English. Their familiarity with Yorkshire accent would be attributed to their learning experience with RP. There were 50% more participants reported to be familiar with Thai accent than with Cantonese accent. As shown in Table 1, the participants required comparatively larger amount of phonological information for the perception of Cantonese-accented English than Thai-accented English, even though the mean difference turned out to be nonsignificant. Nevertheless, this finding was inconsistent with findings in some previous studies (e.g. Munro & Derwing, 1995; Clarke & Garrett, 2004; Bradlow & Bent, 2008; Clarke & Garrett, 2004; Bradlow & Bent, 2008; Sidaras et al., 2009), which claim that listeners could both adapt rapidly to unfamiliar speakers and accents, thus they do not require additional processing time for the perception of accented speech. The inconsistent findings might be attributed to two reasons. First, the testing material of the present study was not sufficient for the participants to adapt to the foreign accents. Second, the majority of the participants' English proficiency levels were intermediate rather than advanced, which may have limited their quick adaption to unfamiliar foreign accents.

Moreover, the participants' English proficiency level and its interaction with the presented accents were both found to have had a significant effect on accented L2 perception. Not much evidence is available from previous studies concerning the influence of L2 proficiency level on listeners' perception of accented L2. Assumingly, advanced L2 learners are more capable of perceiving the speech sounds of L2 than the less advanced (Vandergrift, 2005; Best & Tyler, 2007). It seems this assumption applies to the perception of accented L2.

Another interesting finding was that the variable *the years that participants had been learning English as an L2* did not play a significant role on the participants' perceptual performance. Although the findings in Leikin et al. (2009) were similar to the one in the present study, the participants in Leikin et al. (2009) began their L2 study after puberty. In the present study, however, some of the participants started L2-English learning since their childhood (-7 years old, whereas others began learning English at the age of 13+). Unexpectedly, there was not a significant difference among them concerning the amount of phonological information that they needed for accented English perception.

Conclusion

The present study investigated factors that may have influence on language listeners' perception of accented L2. L1-Mandarin of L2-English speakers' perception of English sounds in Mandarin-, Thai-, Cantonese-, and Yorkshire-accent was tested. According to the findings, the presented accents, linguistic experience with the target accents, and proficiency level of the target foreign language all had significant effects on their perception of the accented speech.

One of the deficiencies of the study was that the participants' response time was not recorded. Thus, it was not clear whether the participants needed more time in the perception of one accented English sounds than others. Future studies on this issue may take it into consideration, which may help to gain further insights into this topic.

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