International Invention of Scientific Journal
Online ISSN: 2457-0958
Available Online at https://iisj.in **Volume 8, Issue 03 (July-August-September)|2024**|Page: 450-457
Original Research Paper- Clinical Psychology

The Differences in Phonological Characteristics of Farsi Speakers of English and Native English Speakers

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Article Received: 28-June-2024 Revised: 19-July-2024 Accepted: 08-August-2024

ABSTRACT:
Many English-learning students of Iran and Farsi speakers of English abroad have pronunciation problems, which affect their intelligibility when interacting with native English speakers. The present research was carried out to assess the perception of native English speakers toward the impact of pronunciation on the intelligibility of Farsi speakers of English. In total, thirty-three Farsi speakers of English and thirty-three native English speakers participated in the study. The research method was an unstructured twenty-item interview that contained specific phonemes and ten sentences including consonant clusters. In terms of gender, the analysis of the hypothesis showed that there are not any significant differences in terms of morphological features between men and women, as well as the Farsi and native speakers of English. Also, in terms of educational level, there are less significant differences in the morphological features used by individuals with an education level of master's degree (or above), compared to those with a bachelor's degree (or below). Finally, in terms of age, the results obtained from the analysis of the hypothesis showed no significant difference in the morphological features used by the Farsi speakers of English and native English speakers. Results indicated that Farsi speakers of English experienced various degrees of difficulties mainly for expressing the phonemes and consonant clusters that are not present in the sound system and syllable structure of Farsi language. As a result of these findings, the conclusion is drawn that pronunciation does affect the intelligibility of Farsi speakers of English.

Keywords: Phonology, Phoneme, Phonological characteristics, Morphological features, Intelligibility, Consonant clusters

1. INTRODUCTION:

Foreign accents of non-native English speakers (Chinese, Italian, and Farsi accents) are easily detected by L1 English speakers. Foreign accents influence the eloquence of certain sounds, uncovering the non-native background of the speakers of English as a Foreign Language (EFL). When compared to the original sound system, phonetic differences that occur from the norms of a language in foreign accents seem unfamiliar to the L1 speakers of that language. Therefore, the accented speech of EFL learners may appear inarticulate, or more effort might be needed to understand these speakers if they are intelligible (Bekleyen, 2011; Hosseini and Talebinezhad, 2014).

Generally, intelligibility is the most important goal for language learners. In this regard, Fraser claims that learners of English as a Second Language (ESL) must be capable of "speaking English with an accent, or accents, of their choice, which is easily intelligible to an ordinary English speaker of average goodwill." Indeed, intelligibility is the degree to which a listener can comprehend the message that is being conveyed. Kenworthy defines intelligibility as "being understood by an interlocutor at a given time in a given situation." (Berent et al., 2017; Nandia et al., 2016; Regala-Flores, 2016).

A major difficulty facing almost any ESL/EFL learner is the achievement of acceptable pronunciation that enables them to be understood by the L1 English speakers. Many of these learners master the elements of language such as syntax, morphology, or even semantics to the level of almost 'native-like' competence but often fail to master phonology. According to Avery and Ehrlich, the nature of a foreign accent is determined to a large extent by the learners' L1. In other words, the sound system and syllable

structure of the L1 have some influence on the speech or production of the L2. To support this view further, Swan and Smith suggest that the pronunciation errors made by L2 learners are considered not to be just random attempts to produce unfamiliar sounds, but rather reflections of their L1 sound system. The absent phonemes in the Farsi sound system do cause difficulties for the intelligibility of Farsi speakers of English. In addition, the differences in the Farsi and English syllable structures also cause difficulties to a varying degree for Farsi speakers of English (Fatemi et al., 2012; Hall, 2007; Huang and Jun, 2011).

This study investigates the phonological characteristics of Farsi speakers of English and perceptions of L1 English speakers toward proficiency. Specifically, this study has two main objectives: Noting the extent of the mentioned issues and limitations of research in this regard, the current study was conducted to spot the most frequent phonological errors by Iranian EFL learners based on 'segmental features'. It is hoped that our findings help EFL teachers become familiar with the possible problems faced by these learners in terms of English pronunciation. Furthermore, awareness of these issues, which mainly arise from the lack of familiarity of the students with certain phonemes, allows EFL teachers to spend more time on the correction and application of unsettling phonemes that may disrupt proper speech.

2. Research Hypothesis

2.1. Main Hypothesis

"Persian phonological features interfere with the common communications of Farsi speakers of English with the native speakers of English."

2.2. Secondary Hypotheses

Secondary Hypothesis 1: There is a significant difference in the phonological features used by men and women, as well as the Farsi speakers of English and native English speakers.

Secondary Hypothesis 2: There is a significant difference in the phonological features used by Farsi speakers of English compared to native English speakers in terms of education level.

Secondary Hypothesis 3: There is a significant difference in the phonological features used by Farsi speakers of English compared to native English speakers in terms of age.

3. Methodology

3.1. Design

Design in a research paper is the most important step. Because it refers to the overall strategy that we choose to integrate the different components of the study coherently and logically; thereby, ensuring we address the research problem effectively. As a result, because of the nature of the problem in this study, I conducted qualitative research design which tends to be more interested in presenting a natural and holistic picture of the phenomena being studied. In this case, qualitative research can reliably help us to gain a deeper understanding of the nature of second language and foreign language learning.

3.2. Participants

There were two different and distinctive groups of participants taking part in this research. The first group consisted of 15 adult females and 18 males Farsi speakers of English between the ages of 25 to 45who were all from Iran. Each member of the group had a similar level of English education in Iran and all had achieved an IELTS test score of six in speaking; moreover, the participants were recruited through contacts at university and acquaintances of other students.

The second group of participants consisted of 13 adult females and 20 males L1 English speakers who have lived in English-speaking countries for almost all of their lives. The ages of the five members of this group also varied from 25 to 45 and they all worked in professional roles. It should be mentioned that it was not important whether they had any formal linguistic knowledge or not. Moreover, these participants were recruited through my friend who lives in the United States and I asked him by the principles and criteria of this research, to do the research process for the participants.

3.3. Instruments

In the present study, I have used six instruments: three of them were related to the Farsi speakers of English, and three were designed to be used by the L1 English speakers. A Micro Cassette Recorder was used to record the Farsi speakers of English participants' voices, to be played back by the L1 English speakers to interpret what had been said.

3.3.1. Instruments for Farsi Speakers of English

Firstly, a questionnaire consisting of five open-ended questions relating to the topic of how the Farsi speakers of English felt about English and the English culture was used in an unstructured interview to examine the extent to which phonological characteristics of Farsi speakers of English interfere with their intelligibility when they interact with L1 English speakers.

Secondly, twenty sentences including specific words were used by asking the Farsi speakers of English to read them aloud. It should be noted that the specific words in these sentences contained specific consonants

and vowels which were identified previously in the literature review to have caused difficulties for Farsi speakers of English to be understood by the L1 English speakers.

Finally, ten sentences including specific words were used by asking the Farsi speakers of English to read them aloud. It should be mentioned that these words contained the consonant clusters which were identified previously in the literature review to have caused difficulties for Farsi speakers of English in being understood by the L1 English speakers.

3.3.2. Instruments for L1 English Speakers

After the participation of Farsi speakers of English, the tape recording of the results was given to each of the L1 English speakers to interpret what had been said by the Farsi speakers of English.

Firstly, after listening to the interview of each Farsi Speaker of English, a questionnaire consisting of three open-ended questions was given to be answered by the L1 speakers of English. It should be noted that in these questions, the participants were asked to rate the Farsi speakers of English from best to worst (giving the reasons why) based on their intelligibility.

Secondly, the participants were given twenty pairs of sentences in a limited multiple choice format including minimal pairs, half being identical to the sentences given to the Farsi speakers of English to be read aloud. The participants were asked to listen to the twenty sentences read aloud by each Farsi speaker of English, and then select and mark one of the paired sentences provided to indicate the sentence that they had heard whilst listening to the tape recording.

Finally, a list of ten sentences, each with some missing words including consonant clusters was provided to the L1 English speakers to fill in the missing words as they had understood them whilst listening to the tape recording of each Farsi speaker of English.

3.4. Data Collection Procedure

At the beginning of the research process, the participants were informed of the purpose of the study and that their identities would be kept confidential in the research report. Each participant was given an information sheet and a consent form that they were required to read and sign. Furthermore, the process of data collection was explained verbally in detail to all the participants.

The first stage commenced with an interview of unstructured spontaneous speech in the form of a questionnaire consisting of five open-ended questions with the Farsi speakers of English relating to the topic of how they felt about English and the English culture. Next, by using the elicited speech method, participants were asked to read aloud twenty sentences to demonstrate the likely pronunciation errors of Farsi speakers of English and finally, the participants were asked to read aloud ten sentences to demonstrate the likely pronunciation errors in consonant clusters by Farsi speakers of English.

The second stage commenced with the L1 English speakers listening to 33 interviews relating to how the Farsi speakers of English felt about English and the English culture and then answering three open-ended questions relating to these interviews. Next, the L1 English participants were asked to listen to twenty sentences which were read aloud by the identified Farsi speakers of English and subsequently, they were asked to select and mark one of the pairs of sentences provided to indicate the sentence that they had heard whilst listening to the tape recording. Finally, after listening to ten sentences read by the identified Farsi speakers of English, the L1 English participants were asked to fill in the missing words from ten sentences provided as they had understood them whilst listening to the tape recording.

3.5. Data Analysis

In analyzing data, I investigated the use of minimal pairs in word-initial, word-medial, and word-terminal positions in a Pilot Study to examine the intelligibility of Farsi speakers of English to L1 English speakers. It should be noted that after analyzing the outcomes of the Pilot Study, I decided to expand the research to examine L1 English speakers' perceptions of the effect of pronunciation on the intelligibility of Farsi speakers of English. To achieve this, minimal pairs were inserted into sentences where alternate but different meanings were possible.

4. Results

4.1. Assessment of Assumption of Normality of Variables

Before determining an appropriate statistical method for the article, the assumption of normality of variables was descriptively evaluated using the Kolmogorov–Smirnov test. However, parametric tests of independent t-test and analysis of variance would be applied in case of lack of following a normal distribution.

According to the results, the sample population consisted of 19.7% individuals aged <25 years, 9.1% subjects aged 25-30 years, 25.8% individuals aged 30-35 years and 45.5% subjects aged >35 years. In this regard, subjects aged >35 years constituted the majority of the samples. The sample population consisted of 42.4% female and 57.6% male subjects. In addition, 45.5% of the subjects had bachelor's degrees and 54.5% had master's degrees or higher, constituting

the largest proportion of the sample size. According to the results, 50% of the subjects were Farsi-speaking and the other 50% were English-speaking individuals.

In terms of age of Farsi-speaking individuals, they were categorized as follows: 21.1% were aged <25 years, 3% were aged 25-30 years, 18.2% were aged 30-35 years, and 57.6% were aged >35 years, which constituted the larger proportion of the samples. On the other hand, the English-speaking subjects were assessed regarding age, results of which are provided as follows: 18.2% aged <25 years, 15.2% aged 25-30 years, 33.3% aged 30-35 years, and 33.3% aged >35 years, which constituted the majority of samples. 45.5% of Farsi-speaking subjects were male and 54.5% were female, who constituted the larger proportion of the samples. On the other hand, an assessment of English-speaking participants revealed that 39.4% of the subjects were female and 60.6% were male, who constituted the majority of the participants.

In the Farsi-speaking group, 36.4% of the participants had bachelor's or lower degrees and 63.6% had master's or higher degrees. On the other hand, 54.5% of English-speaking subjects had bachelor's or lower degrees and 45.5% had master's or higher degrees.

In Kolmogorov–Smirnov test, the evaluated hypotheses in the research are defined, as follows:

$$\begin{cases} H_0: \text{Observations follow a normal distribution} \\ H_1: \text{Observations do not follow a normal distribution} \end{cases}$$

Given the level of significance (0.05), the hypothesis of normal distribution of observations (zero assumption) is not rejected. Therefore, parametric tests were used to evaluate the hypotheses.

4.2. Main Hypothesis

Phonological features of the Farsi language interfere with the intelligible communication of Iranian students with English native speakers.

Table 1. Independent Samples Test.

Variable	Group	Mean	Std. Deviation	t	Sig. (2-tailed)	95% Confidence Interval of the Difference	
						Lower	Upper
Phonological Features	Persian Language	9.36	4.16	-2.223	.030	0.026	4.18
	English Language	11.67	4.25				

The obtained P-value was compared with the value of 0.05 on the confidence level. Since this amount was less than the concerned margin of error in the Farsi and English groups (0.05), the H_0 hypothesis is rejected (Table 1). On the other hand, the desired confidence interval was positive, thereby indicating the higher mean variable in the English-speaking group, compared to the Farsi-speaking group. This demonstrated the equal mean of diabetes control in both male and female groups. According to these findings, it could be concluded that the phonological features of the Farsi language interfere with the intelligible communication of Iranian students with native English speakers.

4.3. Secondary Hypotheses

4.3.1. Secondary Hypothesis 1

According to the results, a significant difference was observed between the phonological features of female and male subjects and Farsi speakers of English with English native speakers (rejected).

Table 2. Independent Samples Test.

Variable	Group	Mean	Std. Deviation	t	Sig. (2-tailed)	95% Confidence Interval of the Difference	
						Lower	Upper
Phonological Features	Female	11.71	4.13	1.98	0.053	-4.37	.233
	Man	9.63	4.31				

The obtained P-value on the confidence level of 95% was compared to the 0.05 value. Given the fact that this amount was more than the desired margin of error (0.05) for the variable, the H_0 hypothesis is not rejected (Table 2). On the other hand, the concerned confidence interval also includes zero; therefore, no significant difference was found in phonological features of female and male participants, and Farsi speakers of English with native English speakers.

4.3.2. Secondary Hypothesis 2

A significant difference was observed between the phonological features of Farsi speakers of English and those who are native English speakers based on their educational level.

Table 3. Independent Samples Test.

Variable	Group	Mean	Std. Deviation	t	Sig. (2-tailed)	95% Confidence Interval of the Difference	
						Lower	Upper
Phonological Features	Master Lower	9.38	4.66	2.40	0.018	0.411	4.54
	Senior and higher	11.86	3.51				

The obtained P-value on the confidence level of 95% was compared to the 0.05 value. Given the fact that this amount was less than the desired margin of error (0.05) for the education variable, the H_0 hypothesis is rejected (Table 3). On the other hand, the concerned confidence interval was positive, indicating a difference in phonological features of individuals with master's or higher degrees, compared to those with bachelor's or lower degrees. Therefore, a significant difference was found in phonological features of Farsi speakers of English with those who are native English speakers based on their educational level.

4.3.3. Secondary Hypothesis 3

A significant difference was observed in phonological features of Farsi speakers of English with those who are native English speakers based on their age.

Table 4. Analysis of Variance Test.

Variable	F	Sig.
Phonological Features	1.71	0.106

The level of significance obtained for this variable was compared with the value of 0.05. Since this value for the variable was 0.106, which is higher than the concerned margin of error (0.05), the H_0 hypothesis based on the similarity of difference in phonological features of groups is rejected (Table 4). Therefore, a significant difference was observed in this regard. However, the Duncan test was applied to more evaluate the results.

Table 5. Variable of phonological features.

Age	N	Subset for alpha = 0.05
		1
25 to 30 years	6	9.67
Over 35 years	30	9.40
30 to 35 years	17	10.58
Less than 25 years	13	11.00
Sig.		.304

According to Table 5, the Duncan test categorized the variable of phonological features in one group. Therefore, no significant difference was found in phonological Farsi speakers of English with those who are native English speakers based on age.

4.4. Analysis of the Findings Based on the Demographic Data of Research Samples

Research samples were aged less than 25 years (19.7%), 25-30 years (9.1%), 30-35 years (25.8%), and more than 35 years (45.5%), and the last group constituted the largest sample size in terms of age. In addition, 42.4% of the participants in the current study were female, and 57.6% were male, who constituted the largest portion of the sample size in terms of gender.

Regarding education status, 45.5% of the research subjects had a bachelor's degree (or below) and 54.5% had a master's degree (or above), which accounted for the largest sample size. Farsi and English speakers constituted equal proportions in the present study (50%). In the group of Farsi speakers, 21.2% were aged less than 25 years, 3% were aged 25-30 years, 18.2% were aged 30-35 years, and 57.6% were aged above 35 years, who accounted for the largest portion of the sample size in this regard. In the English-speaking group, 18.2% were aged less than 25 years, 15.2% were aged 25-30 years, 33.3% were aged 30-35 years, and 33.3% were aged above 35 years, who constituted the largest sample size in this regard.

In the group of Farsi speakers, 45.5% and 54.5% of the participants were female and male, respectively, and men accounted for the largest sample size. According to the table and diagram presented above, the English-speaking group consisted of 39.4% female participants and 60.6% male participants, and men constituted the

largest sample size in this regard. Concerning education status in the group of Farsi speakers, 36.4% of the research samples had a bachelor's degree (or below), and 63.6% had a master's degree (or above). In the English-speaking group, these values were determined at 54.5% and 45.5%, respectively.

5. Discussion

Essentially, the analysis of findings supports the notion that phonological characteristics (segmental features) of Farsi speakers of English interfere with their intelligibility when they interact with L1 English speakers. In addition, this study highlights the extent to which phonological characteristics of Farsi speakers of English affect their intelligibility whilst conversing with L1 English speakers which was the first objective of the study.

The results of the current study confirmed the prediction of the Contrastive Analysis Hypothesis that the absent phonemes /w, θ, ð, Ɔ, I/ in the Farsi sound system do cause difficulties in the intelligibility of Farsi speakers of English. To illustrate the point, of three absent consonants /w, θ, ð/, the phoneme /θ/ with the intelligibility rate of 47% and the phoneme /ð/ with the intelligibility rate of 54% demonstrate the high functional load of these phonemes. On the other hand, the phoneme /w/ with an intelligibility rate of 80% revealed that this phoneme has a low functional load; however, the study found that 20% of the time, this phoneme still caused some problems for the Farsi speakers of English.

In considering the absent vowels /Ɔ/ and /I/, the phoneme /Ɔ/ with an intelligibility rate of 55% highlighted the fact that this phoneme has a high functional load; conversely, the phoneme /I/ with an intelligibility rate of 80% showed that this phoneme has a low functional load which may cause fewer problems for Farsi speakers of English.

It should be mentioned that when I considered the two vowels /æ/ and /D/ that both exist in Farsi and English vowel systems in this study, the expectation was that they would have caused no difficulties at all for the Farsi speakers of English. In the case of the phoneme /æ/, the findings supported this expectation; however, surprisingly, I found that the phoneme /D/ in English, which is classified as the same phoneme /D/ in Farsi caused a profound number of difficulties with an intelligibility rate of 20% for the Farsi speakers of English. This finding agrees with the moderate version of the Contrastive Analysis Hypothesis that claims, that wherever patterns are minimally distinct in form or meaning in two systems, confusion may occur. Moreover, I believe that the phoneme /D/ in Farsi is more similar to the phoneme /Λ/ in English which is absent in the Farsi sound system. Indeed, this might be the reason that the Farsi speakers of English participating in the study were understood to have said 'wondering' instead of 'wandering' by the L1 English speakers 80% of the time.

In considering consonant clusters, the analysis of findings showed that due to the differences between the Farsi and English syllable structures, the Farsi speakers of English experienced problems with English consonant clusters to varying degrees. Specifically, I found that SC (S+ Consonant) clusters which are absent in Farsi caused more problems for the Farsi speakers of English than non-SC clusters.

It should be mentioned that the findings of this study have similar results to a study conducted by Major and Kim in which they found that beginning and advanced Korean learners of English performed better with similar sounds. For example, the similar sound /dʒ/ was pronounced better by both groups of learners than the dissimilar sound /z/. They concluded that Korean learners of English often substituted the absent phoneme /f/ with the phoneme /p/ which exists in the Korean consonantal system. It is an interesting observation that the Korean learners of English chose the phoneme /p/ as the nearest phoneme to /f/, as this exactly corresponds to the conclusions of this study where Farsi speakers of English often substituted the phonemes /θ/ with /t/ and /ð/ with /d/ or /z/, which are the nearest phonemes in the Farsi consonantal system (Cerňaka et al., 2017; Martínez-Flor, 2012; Meia et al., 2015).

In contrast, in another study conducted by Bohn and Fledge, they discovered that even German speakers of English with extended exposure to English did not produce the similar English sounds /i, I, ϵ/ authentically; however, some of the German speakers of English produced the dissimilar sound /æ/ authentically. Thus, they concluded that it is usually similarities and not differences that are harder to acquire because the gross differences are often more noticeable; whereas, minor differences are likely to be noticed and in turn, result in misunderstanding (Nunes et al., 2010; Önem, 2012; Pagliarin and Keske-Soares, 2010).

Nevertheless, the findings of the current study contradict the findings of Bohn and Fledge (1992) as they provide evidence that similar sounds will result in misunderstanding more than dissimilar sounds. However, one exception in the findings of the current study supports the findings of Bohn and Fledge (1992) where similar phoneme /D/, which exists in both

English and Farsi sound systems, caused the Farsi speakers of English to be misunderstood by the L1 English speakers 80% of the time.

In another study, Major found that advanced speakers of Brazilian/ Portuguese performed better with dissimilar sounds than with similar sounds, but the situation was the opposite for the beginning learners who performed better than the advanced speakers with similar sounds. It should be noted that the findings of the current study contradict the findings of Major's study, as the advanced-level Farsi speakers of English with an IELTS test score of six in speaking, all encountered difficulties with dissimilar sounds and in only one instance, a similar sound, /D/, caused a significant problem for most of the Farsi speakers of English (Toreti and Ribas, 2010; Skandera and Burleigh, 2012; Zhang et al., 2017).

6. Conclusions

6.1. Obtained Results Based on the Main Research Hypothesis

Considering the results of the data analysis, the hypothesis $\boldsymbol{H_0}$ is ruled out at the confidence level of 95% and the obtained P-value for the variable (0.05) since in comparison, the determined amount for the variable is less than the considered error margin (0.05) in the group of Farsi and English speakers. On the other hand, the positive confidence interval confirms that the mean variable in the English-speaking group is higher compared to the Farsi speakers. Therefore, it could be concluded that the mean of diabetes control is equal between male and female students, which leads us to the understanding that morphological features of the Persian language significantly interfere with the proper communication of Farsi speakers of English and native English speakers.

6.2. Obtained Results Based on the First Research Hypothesis

Considering the results of the data analysis, the hypothesis H_0 is not ruled out at the confidence level of 95% and the P-value calculated for the presented variable (0.05) since in comparison, the determined value is higher than the error margin (0.05). On the other hand, the confidence interval, which includes zero, is associated with no significant difference in terms of morphological features between men and women, as well as the Farsi and native speakers of English.

6.3. Obtained Results Based on the Second Research Hypothesis

According to the results of the data analysis, the hypothesis H_0 is ruled out at the confidence level of 95% and the P-value calculated for the presented variable (0.05) since in comparison, the determined value is less than the error margin (0.05). On the other hand, the positive confidence interval confirmed the less significant differences in the morphological features used by individuals with an education level of master's degree (or above), compared to those with a bachelor's degree (or below).

6.4. Obtained Results Based on the Third Research Hypothesis

The findings of the current study suggested a significant difference in the morphological features of Farsi speakers of English and native English speakers.

According to the results of the data analysis, the obtained significance level for the variable was compared with 0.05. Considering that the value for this variable included 0.106, which is higher than the determined error margin (0.05), the hypothesis H_0 denoting the same difference between the morphological features of the groups is ruled out. Therefore, a significant difference was observed in the mean variable of the groups.

In the following section, the researcher applied Duncan's test for further evaluation of the findings. In addition, the results obtained from the analysis of the hypothesis showed no significant difference in the morphological features used by the Farsi speakers of English and native English speakers in terms of age.

The study aimed to investigate the phonological characteristics of Farsi speakers of English and L1 English speakers' perceptions of proficiency; therefore, the study was conducted to cover three areas that were related to the aim of the study. Subsequently, the analysis of findings was classified into three sections: an unstructured interview, a twenty multiple-choice questionnaire, and ten sentences with missing words.

The analysis of findings revealed that the absent phonemes in the Farsi sound system do cause difficulties for the intelligibility of Farsi speakers of English. In addition, the differences in the Farsi and English syllable structures also cause difficulties to a varying degree for Farsi speakers of English. Moreover, the findings showed that some Farsi speakers of English were perceived to be the most intelligible speakers by L1 English participants, and this finding was also supported by my analysis of the results of the twenty multiple-choice questionnaires, which included minimal pairs and ten sentences with missing words which included consonant clusters. As a result of these findings, the conclusion is drawn that pronunciation does affect the intelligibility of Farsi speakers of English.

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