دراسة تأثير فرق الرنين في مجموعات الأصوات الساكنة الإنكليزية في دقة أداء متعلمي اللغة الإنكليزية السوريين لهذه التراكيب

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الملخص

يمكن لأي من فرقي الرنين ٢ و٣ أن يتواجد بين حرفين ساكنين يبتدئان مقطعا صوتيا واحدا في اللغة الإنكليزية، ويحمل إحداهما تعليما أكثر من الأخر، وهو بالتالي أكثر صعوبة منه. إلا أن هنالك نظريتان تختلفان في تحديد أيهما هو الأكثر تعليما.

إضافة إلى ذلك، فإن الأبحاث عن تأثير اللغة الأم في تيسير اكتساب المركبات المعلمة المتماثلة بينها وبين اللغة التي يتم تعلمها قد قدمت نتائج متناقضة. كان الهدف الأول لهذا البحث هو تقصي ما إذا كان المشتركون سيجدون إحدى فرقي الرنين أكثر صعوبة من الآخر، حيث أن كليهما يتواجدان في لغتهم الأم، مما يجعل النقل الإيجابي منها ممكنا.

أما الهدف الثاني، والذي اعتمد على إجابة نتيجة البحث للهدف الأول، فكان معرفة أي التركيبين المذكورين هو الأكثر تعليما.

وبالنسبة للنتائج، فقد وجد المشتركون السلسلة الابتدائية المكونة من حرف وقفي أو احتكاكي يليه حرف انحداري هي الأكثر صعوبة

الكلمات المفتاحية:

التعليم، الرنين، فرق الرنين، زيادة الوسط، التقاء الأصوات الساكنة، مبدأ الانتشار، بداية المقطع الصوتي المركبة

Investigating the Influence of the Sonority Distance between the Consonants in a Cluster on its Performance by Syrian Learners of English

Abstract

Either of the sonority distances 2 and 3 can be found in an English tautosyllabic initial cluster. One is marked and, therefore, more difficult than the other. However, two theories disagree on how they compare to each other in regard to markedness. In addition, there is contrasting evidence concerning whether positive transfer from the first language can facilitate the acquisition of marked clusters or not. The first goal was to find out whether Syrian learners would find both types of English onset equally easy as both are in their native language. The second, which depended on how the results would relate to the first, was to find out how marked the two English onset types are relative to each other. The participants in the current study found obstruent–glide clusters more difficult than obstruent–liquid ones.

Keywords:

Markedness, sonority, sonority distance, epenthesis, consonant cluster, dispersion principle, complex onset

1. Introduction

English is one of the most intimidating school subjects for learners. They struggle and spend a lot of time studying it, hence sounding like a native speaker continues to be impossible to achieve. They wonder, "How can native speakers speak so fast and accurately?" The answer is that they can because they learned their language during their early childhood.

According to Chomsky (1965), learning a primary language during early childhood is facilitated by a device in the brain called the Language Acquisition Device (henceforth, LAD). For this reason, toddlers never need to be taught grammar. The LAD receives input from natural speech, processes it, and derives grammatical rules on a subconscious level. On the other hand, adults and teenagers often internalize such rules, and they practice with lots and lots of exercises, yet they keep making errors. This is evidence that the psychological processes of learning and the mechanism responsible for it in adults are different from those in children.

The nature of that mechanism has been a major area of interest in the field of linguistics. Several theories have been proposed. Particularly important is Selinker's (1972) notion of interlanguages, which he defines as the linguistic systems of language learners that are reflected in their utterances when they attempt to speak in the target language. Linguists want to uncover the nature of interlanguages in order to find out what makes language learning

difficult and be able to predict where errors will frequently occur so that they can prevent them.

The first attempt to propose a theory that does that was the Contrastive Analysis Hypothesis (henceforth CAH) proposed by Lado (1957). Its name comes from its use of comparative analysis of the target and native languages to figure out which areas are likely to be difficult. It predicts that aspects of the target language that are similar to the native language's will be easy, while those that are different will be difficult.

However, empirical evidence frequently contradicted the CAH. This urged linguists to form other theories that were more accurate. One of the most influential of them was the Markedness Differential Hypothesis (henceforth MDH) proposed by Eckman (1977). Markedness is a concept that distinguishes related units of language based on the frequency of their cross-linguistic occurrence. The ones that occur more frequently across languages are unmarked, while those that occur less frequently are more marked. For example, voiceless sounds are unmarked and voiced sounds are marked; more languages have the first than the latter. In addition, marked units of language are more difficult to learn than the lesser marked ones. Thus, the voiced sound [v] is less marked than voiceless [f]. Finally, markedness relations are also implicational relations. This means that no language can contain something that is marked without also having all that is lesser marked, and we say that the first implies the latter.

The MDH states that not all areas of the target language (henceforth TL) that are different from the native language's (henceforth NL) will be difficult, only those that are more marked than their NL counterparts. It also states that the difference in markedness between the NL and TL areas determines the amount of difficulty. For instance, the longer a consonant cluster, the more marked it is, so learning biconsonantal clusters will be less difficult than learning triconsonantal ones which, in turn, will be more difficult than single consonants.

In some studies, nonetheless, participants made errors in parts of TL that were identical to those of NL. For example, Altenberng and Vago (1983) studied voice contrast in word-final obstruents by native Hungarian speakers learning English. Although both TL and NL have contrast in that position, the participants frequently devoiced obstruents therein. A similar result was obtained by Eckman (1981), who studied Farsi speakers' performance of the same target area, and despite the similarity of NL and TL, the participants devoiced final obstruents.

In the previous two studies, the area of the target language that the participants found difficult was marked, but it was present in both NL and TL. Therefore, the fact that it was relatively difficult blatantly contradicts with the MDH, which predicts difficulty only in areas of TL that are different from and more marked than those of NL. Therefore, a different theory is needed to explain the findings of these studies.

The Interstructural Language Conformity Hypothesis (henceforth, ISCH), introduced by Eckman et al. (1989), serves that purpose. It states that language universals that apply to primary languages apply to interlanguages, as well. Markedness is a language universal (Eckman, 1981). Therefore, it is sufficient to make predictions about difficulty; no other factor, such as NL transfer, is involved according to the ISCH.

However, Eckman (2008) provides three categories of empirical evidence that supports the MDH, and one of those also serves as evidence of NL interference. It is that when learners speaking different NLs are learning the same TL, the ones whose NL areas are closer in their level of markedness to the TL ones find these areas easier than the others do. Therefore, considering the conflicting evidence of the MDH and the ISCH, there is uncertainty regarding whether NL transfer affects learning.

2. Sonority

Sonority in phonetics means loudness of a speech sound. For example, voiceless stops are the least sonorant since they lack the voicing feature and are, therefore, not loud at all. However, in phonology, the loudness of a sound is irrelevant in this respect. In this field, it is where that sound usually occurs in syllables that is an important criterion when classifying sounds according to sonority. Certain patterns of syllables are universally preferred. For example, the phonemes [p], [t], and [k] occur more frequently in onsets than [m], which occurs more frequently in that position than

[l]. Furthermore, for sequences of consonants that belong to the same syllable, some arrangements are more common than others, depending on whether the consonants belong to an onset or a coda. For instance, /gl/ occurs more frequently than /lg/ in onset positions, and vice versa in codas.

To account for these phenomena, linguists assign sounds sonority values according to how frequently they appear in certain syllable positions. Those that are usually on the outer periphery of syllables are the least sonorant, while those that tend to be closer to the peak are more sonorant; the closer they are, the bigger their sonority value. Thus, sonority rises towards the peak then falls towards the coda. This is known as the Sonority Sequencing Principle (henceforth, SSP) (Clements, 1990).

Many scales ordering speech sound categories like obstruents and glides according to sonority have been proposed. Some are not very detailed, while others assign sounds belonging to the same category different sonority values, such as Selkrik's (1984) scale, which put /r/ in a higher rank than /l/ although both are liquids. However, one of the most important scales is Clements's (1990, p. 292):

O(bstruents) < N(asals) < L(iquids) < G(lides)

Scales are helpful in measuring sonority distance, which is the difference in sonority between sounds. For example, the difference between an obstruent and a nasal is one step on Clements's scale above. As linguists have observed, farther distances in

tautosyllabic consonant clusters are more cross-linguistically common than closer ones. Selkrik (1982) and Steriade (1982) use a Minimal Sonority Distance (henceforth MSD) parameter to formally account for that preference. Each language requires a minimum distance between tautosyllabic consonants. Spanish, for example, requires it to be 2. Therefore, its syllables can have obstruents followed by liquids, which are 2 steps higher on the scale, but not by nasals, which are only 1 step higher. We say that the MSD setting in Spanish is 2. There are 4 possible others. The least marked is 4. Languages with this setting allow only single-obstruent clusters. The most marked is 0, and it allows any combination.

On the other hand, Clements (1990) argues that the least marked initial demisyllable, which consists of an onset and a peak, has a maximal and even rise in sonority from the first to the latter, while the least marked final demisyllable has a minimal, uneven drop towards the coda. This implies that farther distances are preferred only in onsets, not in codas. Moreover, unlike the MSD, Clements takes into account the evenness of the rise or fall in sonority in addition to its sharpness. He uses the term dispersion; the less even and the less sharp a rise or fall is, the more dispersed. Moreover, dispersion has a value called d, which can be calculated. When an onset's dispersion is big in value, it is considered to be marked, and vice versa for codas. This is called the Dispersion Principle.

For certain onsets, the MSD and the Dispersion Principle make the same predictions. For example, according to both, obstruent-liquid onsets are less marked than obstruent-nasal ones. First, the theories above agree on the unmarkedness of farther distances, and the first one's distance is farther than the latter's. Second, the sonority rise in obstruent-liquid onsets is more even than the other's; the difference in sonority between an obstruent and a liquid is 2, which equals that between a liquid and a vowel. On the other hand, in obstruent-nasal onsets, sonority first rises one step towards the nasal and then three towards the peak.

However, the two predictions of the theories for obstruent-glide onsets are different. According to the MSD, since they have the farthest distance of all clusters, they are the least marked and will be the least difficult to learn. On the other hand, according to the Dispersion Principle, obstruent-glide clusters are more marked than obstruent-liquid clusters because their sonority rise is less even.

Empirical evidence for both views does exist. Broselow and Finer (1991) studied onset production by Japanese and Korean English learners in order to test the predictions of the MSD parameter. They also aimed to find out if markedness varied between fricative-initial onsets and stop-initial ones and between onsets beginning with voiced sounds and those beginning with voiceless ones. The reason was that some scales assign sounds carrying the features [+continuant] and [+voiced] higher sonority ranks than

their counterparts that lack them. The results were as follows: error rates were higher in stop–liquid and stop–glide clusters than fricative–liquid and fricative–glide ones. They were also higher in clusters beginning with voiced obstruents than the ones beginning with voiceless ones. The researchers claim this supports the MSD.

However, Eckman and Iverson (1993) argue that these results can be explained independently from sonority using typological markedness, which means implicational relationships between language units, alongside Clements's (1990, p. 313) Sequential Markedness Principle, which states, "For any two segments A and B and any given context X–Z, if A is simpler than B, then XAY is simpler than XBY." Simpler means less marked. These explain Broselow and Finer's results without resorting to sonority because fricatives are typologically marked compared to stops. Therefore, any sound sequence containing a fricative is more marked than another that has a stop instead according to Clements's principle above. The same logic applies to the voice/voiceless distinction, with the former being the marked one.

In addition, Eckman and Iverson (1993) conducted a study on learners whose native languages were the same as Broselow and Finer's participants. They used natural conversation to collect the data. This led to different clusters being produced in different amounts. Therefore, instead of comparing numbers of errors, they set a criterion to determine whether a participant had acquired a cluster, which was an 80% accuracy rate, in order to see whether

the marked clusters always implied the unmarked ones in the interlanguages of the participants. The results conformed to typological markedness and the Sequential Markedness Principle. However, some of the participants reached the criterion for obstruent-liquid clusters but not for obstruent-glide ones. This contradicts the MSD; the former's distance is smaller than the latter's. Moreover, this cannot be explained by typological markedness; there is no implicational relationship between liquids and glides. However, Clements's Dispersion Principle makes the correct prediction in this case, and Eckman and Iverson use it to account for the results.

Hancin-Bhatt and Bhatt (1997) also tried to test the MSD's predictions. They included Spanish participants because Spanish has all biconsonantal onsets except obstruent-glide ones. They argued that this would allow markedness and transfer interaction, if any, to manifest more clearly than it could in the previous studies, in which the participants' NLs, Japanese and Korean, allowed no clusters. They also included Japanese ones as the previous two studies did so that they could compare the latter with their own.

The Japanese performed similarly in all the cluster types included, and the conclusion was that they had mastered all of them. On the other hand, their Spanish participants made more errors in fricative-initial onsets than stop-initial ones, which conforms to the MSD. However, they made most errors in obstruent-glide onsets.

Hancin-Bhatt and Bhatt explain this with NL transfer as Spanish lacks the latter clusters.

In the studies mentioned so far, the error rates of obstruent-glide clusters were not consistent. Moreover, wherever the results supported the MSD, alternative explanations were also plausible. First, Broselow and Finer (1991) report that the fewest errors in their study occur in these clusters and argue that this supports the MSD. However, it is not certain that obstruent-glide sequences are represented as consonant clusters on the structural level in the NLs of their participants, Korean and Japanese. Many linguists argue that in these languages, glides that are preceded by consonants are best analyzed as the first parts of complex syllable peaks. This implies that the low error rate of obstruent-glide onsets might have resulted from their not being actual clusters. Second, Eckman and Iverson's (1993) results for these onsets were the opposite; they supported the Dispersion Principle and contradicted the MSD. Third, Hancin-Bhatt and Bhatt's (1997) results were similar to the second in that obstruent-glide onsets were most difficult, but they explain that with NL transfer's overriding the MSD's effect claiming that their study does not overall contradict this parameter. However, it is also logical to use the Dispersion Principle to account for the same thing. In other words, it is not clear whether their study supports the MSD while showing some interaction with NL transfer, or contradicts it and supports the latter principle as well as typological markedness.

In contrast, the native language of the participants of the current study is Syrian Arabic, which, unlike Spanish, allows all biconsonantal onsets. This makes it possible to compare the predictions of two pairs of theories without ambiguity. The first pair is the MDH and ISCH and the second is the MSD and the Dispersion Principle. First, if the error rate in obstruent-glide onsets is relatively high despite their presence in NL, this cannot be explained with first language interference but only with the Dispersion Principle. That is, the cause will be clearer than it was in the latter study. Second, there are two possibilities regarding how the performances of the marked and unmarked clusters will compare to each other as they are found in both English and Syrian but one is universally more difficult than the other. The first possibility is that the performance of all clusters will be on a similar level due to positive transfer. This will support the MDH but contradict the ISCH, which predicts that markedness will cause difficulty in interlanguages the same way it does in primary languages. The other possibility is that the participants will find marked clusters more difficult than the less marked ones. This will support the ISCH but contradict the MDH.

3. Objectives of the study

The first objective of this study is to see whether similarity between NL and TL will facilitate learning marked clusters as implied by the MDH or be overridden by markedness as the ISCH predicts. The second is to find out how the error rate of obstruent-glide onset

production will compare to that of obstruent-liquid ones. If it is higher, it will be due to the unevenness of the former's sonority rise, and this will support the Dispersion Principle. If it is lower because of their farther sonority distance, this will support the MSD. Finally, it aims to make teachers and curriculum designers aware of sonority and markedness effects so that they adjust curricula and teaching methods accordingly.

4. Research Hypotheses

Hypothesis (1): Even if all TL's onsets are found in NL, the marked onsets will be more difficult than the unmarked ones because according to the ISCH, universals of primary languages similarly apply to interlanguages.

Hypothesis (2): obstruent-glide onsets will be more difficult than obstruent-liquid ones as predicted by the Dispersion Principle, whose empirical support has been stronger than the MSD's.

5. Research questions

In order to achieve the objectives of the study, the following questions are addressed:

1. "Do Syrian learners of English, whose NL has all biconsonantal onsets, make more errors in marked onsets than in unmarked ones?"
2. "Do they find stop-glide onsets more difficult than stop-liquid ones or easier than them?"

6. Methodology

The methodology of the study includes the participants, instruments and procedure:

6.1. Participants

The participants were twenty students of English at Al-Baath University. Eleven of them were third-year students, and nine were fourth-year students. They were chosen because of their advanced level of education, which implies they have enriched their vocabulary enough to recognize most of the words in the test, preventing their erroneously guessing the pronunciation of an unfamiliar word from its written form.

6.2. Instruments

The instrument of the study was a reading test. The participants were handed copies of a list of twenty-seven sentences. These sentences contained monosyllabic words that began with biconsonantal onsets. Both of the sonority distances permitted in English, two and three, were included. Thus, the onsets consisted of either an obstruent and a liquid or an obstruent and a glide; fifteen were of the first type, and eight were of the second. Distance was measured by Clements's following scale:

O(bstruents) < N(asals) < L(iquids) < G(lides).

Regarding place and manner of articulation, the clusters included as many combinations as possible so that no single repeated pattern would cause difficulty that is unrelated to sonority and may affect the results.

6.3. Procedure

The participants were tested in the language laboratory at Al-Baath University because it is soundproof. They were not told the purpose of the study because their knowledge of it would affect their performance.

First, they were handed the copies, and then the sentences were read to them as they followed in order to familiarize them with the relevant words and decrease the likelihood of errors occurring due to wrongly guessing pronunciation from spelling. After that, they were asked if there was any unfamiliar word that they would like to be read again. Finally, they read and were recorded individually.

6.4. Data Analysis procedure

Only the words beginning with two-consonant clusters were transcribed, and each participant's pronunciations were put in their own table. Then the mispronounced words were marked with asterisks. After that, the transcriptions were revised at least four times.

Next, the productions of each distance were calculated. Since fifteen words had distance-two onsets and twenty participants read them, there were three hundred productions of distance two. A similar calculation yields the number of productions of distance three, which was 160. The percentage of errors in each distance was calculated by dividing the number of all its productions by the number of the erroneous ones.

In addition, a repeated-measures ANOVA test was carried out to find out the significance level of the results, which was the

likelihood that they occurred by chance. First, a series of calculations were done, which yielded a number called the F statistic. This number expresses how the variance in error rates between the two independent variables, distance two and distance three, compares to the error rate variance within each one. Therefore, if the difference between the distances' error percentages is big compared to the difference between the participants' error percentages within each distance, the F statistic will be a big number. Moreover, the bigger F is, the more significant the results and less likely to have been obtained by chance. The significance level was calculated using software. Finally, the percentages of the error types in each distance were calculated.

7. Results

The participants were at an advanced level of education, so they pronounced most of the clusters correctly. 93% of the distance-two productions and 83.13% of the distance-three ones were accurate. Therefore, the distance-three onsets, which consist of an obstruent and a glide, were more difficult for the participants than the others. Table 1 and figure 1 demonstrate the difference in error rates between the distances:

	Distance 2	Distance 3
Percentage of errors	83.13%	93%

Table 1. Error percentages of the total productions of each distance.

They show that most errors occurred in distance 3 by a significant margin. In fact, the significance level of the results was very high (p= 0.003).

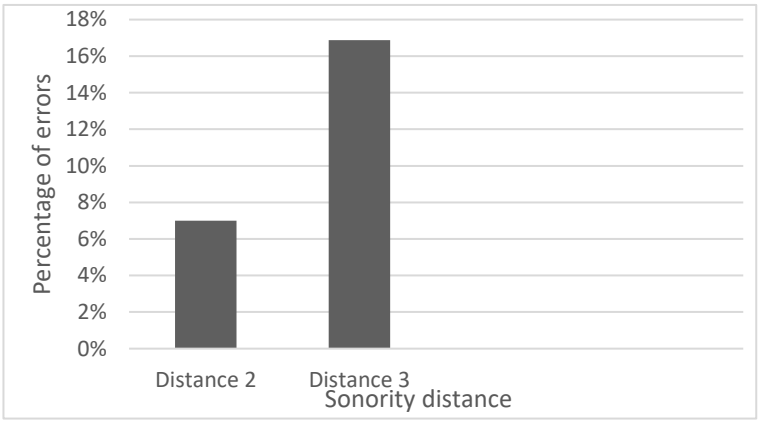


Figure 1. Error percentages of the total productions of each distance.

7.1. Error types

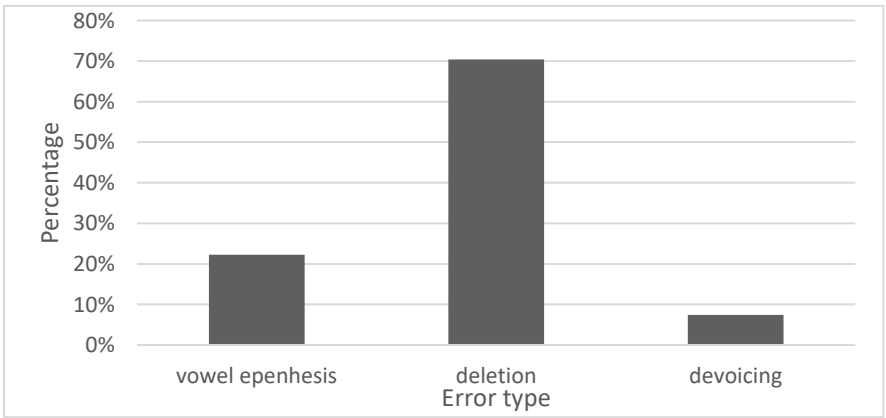
7.1.1. Distance three

There were three types of error in this distance: voicing, deletion, and epenthesis. The proportion of each was as shown in table 2:

	Vowel epenthesis	deletion	devoicing
Percentage of error type	22.22%	70.37%	7.4%

Table 2. Percentage of each error type in distance 3.

Figure 2. Percentage of each error type in distance 3.



As shown in table 2 and figure 2, deletion was the most frequent. A distance-three onset consists of an obstruent followed by a glide, so there were two ways to simplify it by deletion: deleting the obstruent or the glide. The choice was always the second, however. This resulted in obstruent-vowel demisyllables, which were more cross linguistically common and less marked than glide-vowel ones, which would have resulted from the alternative choice. In other words, participants not only modified the marked demisyllables but also produced the least marked output possible, the one that had the sharpest rise in sonority.

Vowel epenthesis means adding a vowel. The participants employing this strategy inserted one between the two consonants of some onsets, transforming CCV demisyllables into CVCV ones. For example, some pronounced [dwel] as [dɪwel], and others as [dʊwel]. Each created two demisyllables that began with single consonants, which were simpler than clusters.

Two participants devoiced *b* in *beautiful*. This conforms to typological markedness as voiceless sounds are less marked than their voiced counterparts.

7.1.2. Distance two

Two types of error occurred in this distance: change of voicing and deletion. Table 3 and figure 3 demonstrate the difference in frequency between them:

	Deletion	Change in voicing
Percentage of error type	20%	80%

Table 3. Percentage of each error type in distance 2.

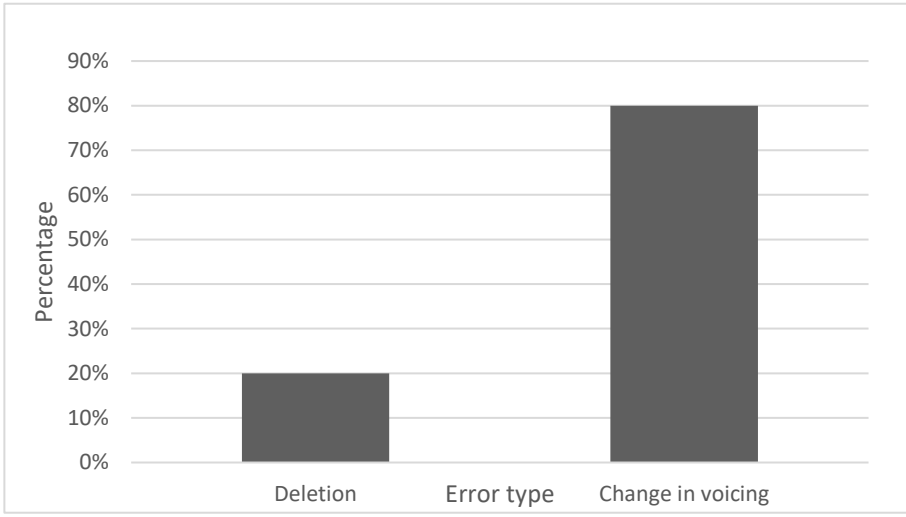


Figure 3. Percentage of each error type in distance 2.

As seen from the figure above, change in voicing was the most frequent. All but one participant making this type of error voiced [p]. This contradicts not only the MSD but also typological markedness as voiceless sounds are less marked than voiced ones. However, Syrian Arabic has [b] but not [p]. Therefore, replacing the latter with the former can be attributed to NL transfer. Moreover, all but one of the participants who voiced [p] when it was a part of a cluster did the same when it was a single consonant. The one that did not enunciated the test words carefully.

The deletion in this distance invariably targeted the glide. This produced the least marked demisyllable possible as the sonority

rise from a nasal to a vowel is sharper than that from a glide to a vowel.

8. Discussion

The results support the ISCH as the participants found universally marked onsets more difficult than unmarked ones. They also contradict the MDH because the latter states that only the marked areas that are different across NL and TL will be difficult yet the clusters associated with the highest error rate were found in NL.

Moreover, obstruent-glide onsets have a farther sonority distance than obstruent-liquid ones, yet they were more difficult for the participants. This contradicts the MSD, which states that smaller distances are more marked than farther ones. On the other hand, this supports the Dispersion Principle. As mentioned, sonority in an obstruent-glide demisyllable, which consists of a distance-three cluster and a vowel, does not rise evenly from the first segment to the peak. Thus, the dispersion value in this type of demisyllable is bigger than an obstruent-liquid one's, in which the sonority rise from the obstruent to the liquid equals that from the latter to the vowel. According to the Dispersion Principle, the more dispersion there is in initial demisyllables, the more marked they are. Therefore, obstruent-glide demisyllables are more marked than obstruent-liquid ones.

The results here are similar to Eckman and Iverson's (1993), some of whose participants had mastered obstruent-liquid onsets but not obstruent-glide ones. However, they contradict Broselow and

Finer's (1991), whose participants made more errors in /br/ onsets than /bj/ ones. Therefore, obstruent-glide sequences are most likely not consonant clusters in Korean and Japanese, which are the NLs of the latter study's participants, who transferred this structural representation to TL, facilitating their acquisition of obstruent-glide English clusters.

The current results were also similar to Bhatt and Hancin-Bhatt's (1997), in particular, the part that cannot be explained by typological markedness. As mentioned, their Spanish participants made the most errors in obstruent-glide onsets. Since these onsets are the only biconsonantal ones that Spanish does not have, the latter results can be explained by NL transfer; another way to explain them is the Dispersion Principle. The current study, on the other hand, was conducted on Syrian EFL learners, and their NL permits all clusters. Therefore, the Dispersion Principle is the only way to account for the current results.

9. Conclusion

1. For advanced learners, the ISCH makes more accurate predictions than the MDH. In other words, areas of similarity between NL and TL will not be easy unless they are unmarked.
2. Obstruent-glide onsets are more difficult than obstruent-liquid ones. Therefore, the Dispersion Principle is more accurate than the MSD; the evenness of a sonority rise is a factor that determines its markedness.

10. Pedagogical implications

1. Errors are inevitable, and reading about markedness will make teachers more patient with students because it will help them realize that.
2. The system of grading should place more value on participation in classes than accuracy.
3. Curricula should provide plenty of opportunities to practice marked clusters within enjoyable activities.

11. Recommendations for further research

1. If possible, researchers should conduct studies that include more participants than this one did because larger scale studies are less likely to produce results by chance.
2. The current study was conducted on advanced participants. However, NL transfer may play a greater role in the other levels of acquisition. Thus, it is necessary to conduct another study on beginner and intermediate learners to see if the results will be similar.
3. Universal sonority preferences for onsets are not the same for codas; a sharp, even rise is unmarked in the former but marked in the latter. Therefore, linguists are urged to study Syrian learners' production of different sonority distances in codas.

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