How Word Recognition Is Affected by Schema Activation: An Investigation Through Listening

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Abstract

Word recognition is of fundamental importance to listening. This research looks into the effect schema-activation has on word recognition during listening. The result shows that, compared with the control group who does not activate relevant schema before listening, the schema-activation experimental group can not only recognize more words, but can better identify words whose sounds are varied during speech stream, discern efficiently the word among the candidates containing a similar phoneme, minimize the chances of refusing to accept a word due to its incompatibility with already-constructed interpretation and is less likely to miss a word due to concentration on the previous material.

Key words: listening; word recognition; schema

1. Introduction

Word recognition is considered to be fundamental to the success of spoken-language comprehension. It refers to identification of words and activating knowledge of word meanings (Rost, 2005: 20). However, due to the fact that there are no reliable clues indicating where a word starts and ends in the sound stream, word recognition is the most problematic process and major source of confusion in language comprehension, particularly for second-language learners.

There exists a body of research designed specifically to explore the word recognition process. Researchers have employed various techniques including mispronunciation detection (Cole & Jakimik, 1978), phoneme restoration tasks (Massaro, 1994) and word-spotting (Cutler & Butterfield, 1992). In addition to the discovery that words
are recognized primarily in a linear fashion, all these researchers have pointed out the possibility of word recognition being influenced by context and words being recognized in a retroactive manner (Rost, 2005). However, owing to the fact that these word recognition studies involve no context (Balling & Baayen, 2008; Broersma & Cutler, 2008; McClelland & Elman, 1986; Marslen-Wilson, 1984) or contexts in an extremely limited sense—only a single sentence (Massaro, 1994), these studies have failed to yield a clear picture of how word recognition is actually affected by the large context in which the word occurs.

It is commonly recognized that in order to construct a mental representation of what they have heard, listeners combine, as put forward by Hulsstijn (2003), the linguistic knowledge with the world knowledge in the form of schema in the memory. According to Long (1989), this world knowledge is organized and stored in the form of schemata which consist of stereotyped scenarios and sequences of actions that define common situations. This structured knowledge is an important basis for language comprehension since it helps simplify the processing of ambiguous or incomplete information (Li, 2003). Listeners rely on both the bottom-up skill of recognizing individual words and the top-down skill of activating schema to make sense of listening materials (Flowerdew & Miller, 2005; Lynch & Mendelsohn, 2002; Rost, 2005; Vandergrift, 2007). Though these processes interact in some form of parallel distributed processing (Bechtel & Abrahamsen, 1991) which means they take place simultaneously rather than successively and though a substantial number of studies demonstrate the compensatory use of schema in filling up the gaps in understanding (Chiang & Dunkel, 1992; Hansen & Jensen, 1994; Huang, 1998; Liu, 1991; Long, 1990; Markham & Latham, 1987), none of these studies deal specifically with the effect of schema-activation on word recognition. In the only research with findings that bear some relevance to this issue, Ma (2007) points out that the success of the application of the top-down process depends to a large extent on the number and accuracy of words identified through the bottom-up process. Since her research focus is to discover whether listeners’ problems are more associated with top-down or bottom-up processing, Ma does not examine the possibly robust relationship between schema-activation and word recognition. One purpose of this study, therefore, is to explore the issue of how word recognition is influenced by a large context, in this case, an activated schema.

In addition to addressing the scarcity of research directly tackling the issue of schema-activation on word-recognition, this study also has a strong pedagogical motivation. According to Hinkel (2006), activating schema in pre-listening is among the range of strategies now recognized as essential for teaching. If its impact on word recognition—the central process in listening (Rost, 2005: 24), could be identified, the teachers of listening would be in a better position to approach listening instruction with confidence. Furthermore, considering the widespread misconception held by many listeners in China that pre-listening activities are of no use, the findings of this research might encourage them to adopt a more positive attitude towards pre-listening activities like schema-activation.

Considering both theoretical and practical perspectives, the present study probed into the following questions: (1) Are there any significant differences in the number of unrecognized words between schema-activation and non-schema-activation listening? (2)
Are there any differences in the reasons for the failure in word recognition between schema-activation and non-schema-activation listening? If so, what exactly are these differences?

2. Methodology

2.1 Participants
Seventy students from two natural intact classes at a university in Shanghai participated in this study. The two classes, which respectively had 33 and 37 students, were randomly chosen from the peer classes at the same level. These students ranged in age from 22 to 30. They were non-English major first-year graduate students who were studying law and economics. They had all passed the national entrance English examination for graduate students, and they were all required to enroll in the English listening course.

2.2 Instruments and Procedures

2.2.1 Instruments
This research employed altogether three different instruments: a questionnaire, a follow-up interview and two listening materials. The questionnaire was developed over a period of one month, and it was designed to find out how frequently various causes leading to failed word identification occur during the listening experiment. To design the questionnaire, the students were required at the beginning of every lesson (four per month) to listen to some authentic materials which generally did not exceed three minutes. Authentic materials were chosen because they were best suited to achieve the goal of helping L2 listeners understand the target language (Vandergrift, 2007). Besides, as both Hulstijn (2003) and Vandergrift (2007) emphasized the importance of letting students consult the written text to read what they have just heard to develop word-recognition skills, the students, immediately after the listening was over, were given the transcripts of the material to help discover the words not recognized during listening. They were cautioned that a word was considered to be recognized only when both its pronunciation and meaning were accessed. Afterwards, they were required to carefully recall their listening experience and peruse the transcripts to underline and number the words they failed to recognize during listening. Then they were asked to write on the accompanying notebook in the corresponding numbered space the self-evaluated causes as to why they had failed to recognize a certain word. Then the students’ work was collected and carefully examined with the purpose of identifying the attributed reasons of word recognition failure. In addition, references to the relevant literature (Brown, 1994: 238-241; Rost, 2005: 20-25) were made to better interpret the students’ data and to possibly complement the questionnaire. The finalized version of the questionnaire comprised 7 short but clearly presented statements describing various reasons leading to failure in word identification during listening. The students could choose whichever statement(s) and any statement(s) for as many times as possible considering their own experience in the formal experiment. For the convenience of the students, the questionnaire was in Chinese.

As mentioned by Vandergrift (2007), researchers investigating a construct as implicit
as L2 listening should use multi-method assessment to collect convergent data, the second research instrument employed by this research was a follow-up interview. The interview used for this research was by nature quite an unstructured one in the sense that many questions were generated by students’ own reflection on their problems in word recognition during the formal experiment.

The two listening materials used for the formal experiment were again chosen from *True Voices* (2003). Material One occurred with the backdrop of a young woman preparing her first Thanksgiving dinner, while Material Two occurred when four co-workers were gossiping about somebody. The overall development of the two listening materials was not difficult to follow, with the only complicating factor of having more than two interlocutors involved. The listening materials were chosen in this way because more interlocutors bring more strands of thought that might potentially activate different schemata which might not be that easy to integrate. Therefore, the materials were capable of posing some challenge to the students. The overall number of words contained was 345 for Material One and 405 for Material Two, and the running time of the materials did not exceed three minutes. All the materials from *True Voices* (2003), including the ones used for the development of the questionnaire, were originally in the VCD form but were transferred to audio tapes in this research.

### 2.2.2 Procedures

The formal experiment was carried out in three steps over a period of one month. In the first step, a thorough explanation with sufficient examples was given to the students to make sure they understood the meaning of every questionnaire item. The students were then given abundant opportunities to gain full understanding of the questionnaire items and procedures by practicing over a number of listening materials.

In the second step, one class was used as the non-schema-activation group; the students approached the dialogue directly, with no preparation time allowed and no idea, either concerning the gist or details of the listening material, revealed. This was done to ensure that no relevant schema was activated before listening. The other class was used as the schema-activation group; before listening to the dialogue, the students were informed of its general background through the introduction of the teacher and were given unlimited time to discuss with their fellow students about the possible scenarios (though most of them finished the discussion within five minutes). This was done to make sure that the schema-activation group students could approach the two listening materials they were to listen to well-prepared, with relevant schematic information activated in advance. The students from both groups listened to one material each time on two separate occasions and were required to complete the questionnaires. The students were required to number the unrecognized words in the tape-script given to them immediately after listening, and then they needed to put the numbers in the corresponding brackets in the questionnaire according to their evaluation of reasons for those unrecognized words.

In the third step, 6 students were respectively chosen from both schema-activation and non-schema-activation groups for the follow-up interview. Among the 6 students from each group, 3 were randomly chosen from the students reporting the greatest numbers of unrecognized words, and the remaining 3 from the students reporting the
smallest numbers of unrecognized words. Before the interview had began, they were given their original tape-scripts and the questionnaires they had completed in the first step, and they were allowed sufficient time to read them and recall their listening experience during the experiment. Afterwards, each student was engaged in a relaxing discussion with the researcher, telling his/her problems associated with failed word recognition during the experiment. During the discussion, notes were taken concerning the important points from the students with their consent. The interview data was believed to be of potential use in clarifying some of the findings from the analysis of questionnaire data.

![Figure 1. Three steps in carrying out the research](image)

### 3. Results and Discussion

The total number of unrecognized words under each category in the questionnaire is counted and inputted into a computer for each student. Later, the data for all students are analyzed through SPSS 11.5 in relation to the two research questions: One is to find out whether or not any significant differences exist in terms of the number of unrecognized words between the schema-activation and non-schema-activation groups. The other is to discover whether there are any differences in the reasons underlying failed word recognition between the two groups. If so, what exactly are these differences? The answers to these two questions are presented as follows.

#### 3.1 Results

##### 3.1.1 The number of unrecognized words

Table 1 displays the results of the quantitative difference between the two groups in terms of the number of unrecognized words during listening. It can be seen that the mean number of unrecognized words from the non-schema-activation group is 30.97 and the counterpart number from the schema-activation group is 25.49. The further statistical analysis shows that the former is significantly higher (i.e. t=3.191, p<.01) than the latter, which means that the former encountered more word-recognition failure than the latter.

<table>
<thead>
<tr>
<th>group</th>
<th>Mean (the number of unrecognized words)</th>
<th>Std. Deviation</th>
<th>T</th>
<th>P</th>
</tr>
</thead>
<tbody>
<tr>
<td>Non-schema-activation (N=33)</td>
<td>30.97</td>
<td>7.183</td>
<td>3.191</td>
<td>.002</td>
</tr>
<tr>
<td>schema-activation (N=37)</td>
<td>25.49</td>
<td>7.171</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
3.1.2 The reasons underlying failed word recognition

Table 2 presents the independent-samples t-test results between the non-schema-activation and schema-activation groups across various factors contributing to failed word recognition, including their respective means, standard deviations and abbreviated forms. It shows that the difference between the non-schema-activation and schema-activation groups concerning misidentification of a word’s phoneme (MWP), sound variation in connected speech (SVS), refusal to accept a word for incongruity (RAI) and concentration on what precedes (CWP) are all positive and significant (p < .01), demonstrating the numbers of failed word recognitions due to these factors in the former group were much higher than those of the latter. Additionally, Table 2 reveals that though the numbers of failed word recognitions attributed to wrong impression of a word’s pronunciation (WIP) and unfamiliarity with a word’s meaning (UWM) are lower in the former group than in the latter, they were statistically not significant (p > .05). The similar insignificant difference (p > .05) could also be identified between the two groups concerning a new word (ANW) despite the number in the former being slightly higher than in the latter.

Table 2. The difference between the two groups concerning various reasons for failed word recognition during listening

<table>
<thead>
<tr>
<th>Reasons for failed recognition</th>
<th>Groups</th>
<th>Non-schema-activation (N=33)</th>
<th>Schema-activation (N=37)</th>
<th>T</th>
<th>P</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Mean</td>
<td>Std. Deviation</td>
<td>Mean</td>
<td>Std. Deviation</td>
<td></td>
</tr>
<tr>
<td>Wrong impression of a word’s pronunciation (WIP)</td>
<td>.88</td>
<td>1.083</td>
<td>1.16</td>
<td>1.365</td>
<td>-.955</td>
</tr>
<tr>
<td>Misidentification of a word’s phoneme (MWP)</td>
<td>3.06</td>
<td>.966</td>
<td>1.38</td>
<td>1.255</td>
<td>6.226</td>
</tr>
<tr>
<td>Sound variation in connected speech (SVS)</td>
<td>4.55</td>
<td>3.001</td>
<td>2.73</td>
<td>2.353</td>
<td>2.832</td>
</tr>
<tr>
<td>Unfamiliarity with a word’s meaning (UWM)</td>
<td>4.85</td>
<td>2.906</td>
<td>5.76</td>
<td>2.842</td>
<td>-1.321</td>
</tr>
<tr>
<td>Refusal to accept a word for incongruity (RAI)</td>
<td>4.30</td>
<td>1.845</td>
<td>2.19</td>
<td>1.596</td>
<td>5.140</td>
</tr>
<tr>
<td>Concentration on what precedes (CWP)</td>
<td>4.18</td>
<td>1.530</td>
<td>2.14</td>
<td>1.653</td>
<td>5.355</td>
</tr>
<tr>
<td>A New word (ANW)</td>
<td>8.15</td>
<td>3.053</td>
<td>8.14</td>
<td>3.824</td>
<td>.020</td>
</tr>
</tbody>
</table>

3.2 Discussion

3.2.1 The number of unrecognized words

As can be observed in Table 1, there was a significant difference in terms of the overall number of unrecognized words between the schema-activation and the non-schema-activation groups. There could be several reasons for such a difference. First, schema activation before listening enables listeners to develop a conceptual framework or a cognitive blueprint which make it easy for them to identify the words with efficiency and accuracy. Second, as suggested by Tyler (2001), schema knowledge can have the benefit of freeing up attentional resources for processing linguistic input. Thus, the working memory consumption will be lower if the listening topic is available (Vandergrift, 2007). It can be reasonably speculated that the participants in the schema-activation group possessed a better capacity in their working memory which can in turn provide them with the comfort of correctly identifying more words with ease during listening.
3.2.2 Reasons underlying failed word recognition

3.2.2.1 Misidentification of a word’s phoneme (MWP)

Viewed from the angle of phonology, phonemes are not indivisible units, but are made of smaller components called distinctive features which help to contrast words (Wen, 1995: 65). It might be suggested that it is not the phoneme as a whole but its component distinctive features that actually assist listeners in differentiating words. Given the rapid speech stream which might blur the demarcation between similar distinctive features, the possibility of misidentifying one phoneme for another always exists. As can be seen from Table 2, the non-schema-activation group experiences significantly more failed word recognition than the schema-activation group owing to misidentification of a word’s phoneme, with the former averaging 3.06 while the latter standing at 1.38. Such a numeric difference can be attributed to the different treatment the two groups had received before listening. The non-schema-activation students had almost nothing to rely on if any confusion regarding the distinction of similar phonemes occurred during listening because they were not given guidance and support by an appropriate schema; such a schema might still be under construction. They could also be given unreliable or misleading support if an inappropriate or even wrong schema was activated. For example, according to the data, some students from the non-schema-activation group confused “clue” with “glue” in the sentence “I have no clue.” They reported that they had actually chosen “glue” because they regarded the dialogue as friends’ conversation about preparing for a costume party and thought “glue” was essential in decorating the party. The only difference between “clue” and “glue” lies in the beginning phoneme with the former containing the distinctive feature of [voiceless] and the latter having [voiced]. The effect of such minor difference in sound might have been entirely overlooked given the fact that these students had strong expectations to see the story develop in a particular direction.

For the schema-activation students, however, they enjoyed strong assistance in distinguishing phonemes from a familiar schema. Again considering the example of confusion between “clue” and “glue”, the schema-activation students know before listening it is about four co-workers gossiping about somebody. As a result, they will expect to hear the four co-workers exchange what they feel to be the unpleasantness of someone, in which “I have no clue.” will be judged to be much more likely to occur than “I have no glue.” This explanation might be echoed by some phoneme restoration experiments which find the top-down information about the context is used to fill in the missing phonemes of words (Garnes & Bond, 1976; Massaro, 1994).

3.2.2.2 Sound variation in connected speech (SVS)

Table 2 shows that the difference between the numbers of words unrecognized due to sound variation in connected speech is considerably different, with the non-schema-activation group having 4.55 while the schema-activation group reaching 2.73. Rost (2005: 25) mentions that sound variations can be categorized into assimilation, reduction and elision. Examples of failed word recognition in terms of these three categories in both groups are presented in Table 3. Although students from both groups reported...
experiencing difficulty in identifying sound variation in connected speech, the non-schema-activation students obviously encountered more problems than the schema-activation students. The non-schema-activation students, for a substantial part of listening, had to rely mainly on the bottom-up process to work out an interpretation of the material. This led to heavy dependence on working with a troublesome yet indispensable feature of spoken English, that is, sound variation in different forms. However, the schema-activation students, armed with a familiar schema before listening, were less dependent on bottom-up processing and could efficiently match the slightly distorted sounds of words heard against those generated from the schema. In other words, unlike the non-schema-activation students whose focus in word recognition was mainly placed on decoding the sound of words, the schema-activation students were more capable of focusing on obtaining distinguishing features of word sounds and then quickly establishing their identity, a task that was less challenging and could in most cases be accomplished with support from a working schema. This explanation is supported in later interviews with students from both groups who reported the positive effect the schema-activation could have had in comprehending more words accurately.

**Table 3.** Examples of words failed to be recognized due to sound variation in speech (the italicized words are the actual words not recognized.)

<table>
<thead>
<tr>
<th>Assimilations</th>
<th>Didn’t you</th>
<th>di(d)n(t)-chu</th>
</tr>
</thead>
<tbody>
<tr>
<td>This turkey will never be done by three.</td>
<td>Domby</td>
<td></td>
</tr>
<tr>
<td>People wear to costume parties and roast it at 300 degrees.</td>
<td>costumbarties Roas(t)i(t).</td>
<td></td>
</tr>
<tr>
<td>picking up potatoes</td>
<td>pickingu(p)/potatoes</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Reductions and elisions</th>
<th>At least it’s defrosted.</th>
<th>Itsd(e)frost(e)d.</th>
</tr>
</thead>
<tbody>
<tr>
<td>I’ve ruined it already.</td>
<td>Ruind(it)already.</td>
<td></td>
</tr>
<tr>
<td>offered to go shopping with her.</td>
<td>Shoppingwith(h)er</td>
<td></td>
</tr>
<tr>
<td>You can’t be serious.</td>
<td>Can(t)be serious.</td>
<td></td>
</tr>
</tbody>
</table>

### 3.2.2.3 Refusal to accept a word for incongruity (RAI)

Table 2 shows that the number of words the participants failed to recognize due to refusal to accept them for incongruity was significantly different between the non-schema-activation students and schema-activation students, with the former reaching 4.30 and the latter scoring 2.19 on average respectively. The finding here shows that the participants cast doubts on and eventually gave up the words they have heard clearly in the beginning. This happened more to the non-schema-activation students, who had to start from scratch to build up a schema to direct them through the listening material. The task was made more challenging when the listening material contained multiple participants in the conversation and each might approach the topic from a different perspective, so it was likely that some non-schema-activation students had to drift between several schemata, resulting in a sharp increase in the number of words they refused to accept due to their incongruity with those schemata. For example, instead of realizing that four people are gossiping about another employee, some non-schema-activation students successively activated the schemata of why a joke is sometimes difficult to understand, how one can
dress properly in a costume party and how difficult it can be to find another half in one’s life. Each time a new schema was activated, doubts were cast on some of the key words leading to the establishment of the previous schema, often resulting in uncertainty about the existence of those words. This problem was also reported in the follow-up interviews by some students who complained about the trouble the frequent changes of schemata had brought to them in word identification. As one student from the non-schema-activation group typically commented: “The key words leading to the construction of a previous schema no longer seem to be real whenever I find it cannot be integrated with the newly-activated schema.” Compared with these students, the schema-activation students had an advantage since they knew the relevant schema in advance which enabled them to integrate a word’s meaning into the material and reduce the chances of drifting between word meanings. Macaro, Vanderplank and Graham (2005) and Li (2003) found that the stubborn insistence on prior knowledge without checking its consistency with the following material can be damaging or even destructive. The finding of this study, however, points out the danger involved in the opposite direction; that is, it is also self-defeating if frequent changes in schema without building connections among different pieces of the text.

3.2.2.4 Concentration on the preceding text (CPT)
According to Table 2, the number of words failed to be recognized due to concentration on the preceding text is significantly larger in the non-schema-activation group than in the schema-activation group, with the former standing at 4.18 and the latter 2.14 on average.

Rost (2005) points out that understanding spoken language is essentially an inferential process. In order to achieve an acceptable interpretation, listeners have to involve themselves in a variety of inferential processes (Rost, 1990) such as estimating the sense of ambiguous references, supplying missing links in elliptic propositions and filling in schematic slots. With no schema activated before listening, the non-schema-activation students were likely to experience more listening breakdowns which might necessitate a more intensive use of inference. Naturally, the probability of concentrating on what precedes the point of breakdown would rise because the breakdown forced them to reflect on the preceding text. However, allocating limited resources in working memory to the preceding text was made at the cost of comprehending the upcoming material. This explanation was supported by the follow-up interviews when many students reported the frustration of missing the upcoming words due to the concentration on the previous material. In contrast, for the schema-activation students, the top-down process, made possible by an activated relevant schema, provided from the beginning an overview for them to make inference, thus reducing the dependence on the preceding information for interpreting what comes up next. It allowed for more attentional resources to be devoted to word recognition.

3.2.2.5 Others
As shown in Table 2, though the number of failed word recognition attributed to the wrong impression of a word’s pronunciation (WIP) and unfamiliarity with a word’s meaning (UWM) were higher in the schema-activation group than in the non-schema-
activation group, they were not statistically significant (p > .05). This demonstrates that schema activation possibly has no effect on helping both to recognize a word whose pronunciation has been incorrectly acquired and to bridge the gap between a word’s pronunciation and its meaning.

The wrong impression of a word’s pronunciation (WIP) was the least significant factor for both groups in explaining failed word recognition (with the schema-activation group reporting 1.16 and the non-schema-activation group 0.88 on average). This finding was slightly unexpected because the widely-documented undergraduates’ neglect of new vocabulary’s pronunciation was assumed to be continued by these graduate students. However, the follow-up interviews showed that neglect of pronunciation was not popular among these mature graduate students, since many of them were conscious of the importance of oral intelligibility. For them, the correct pronunciation of individual words is essential.

What also deserves attention is that unfamiliarity with a word’s meaning (UWM) was the second mostly frequently mentioned reason for failed word recognition for both the schema-activation group and the non-schema-activation group, with the former reporting 5.76 words on average and the latter 4.85. This finding shows that unfamiliarity with a word’s meaning (i.e., familiarity with its pronunciation only) contributed substantially to the overall failed word recognition for both groups, indicating that decoding these words was still a rather inefficient and controlled process for students of both groups. Given the transient nature of the listening process, this inability to gain immediate access to the words’ meaning in the long-term memory may well prevent the students from recognizing words which might otherwise be recognized with little difficulty in a normal reading environment. This finding, to a great extent, coincides with the finding by Liu (1995) that the size of one’s listening vocabulary is much smaller than that of his or her reading vocabulary.

Even though the mean number of failed recognitions due to a new word (ANW) for the schema-activation group was only slightly lower than that for the non-schema-activation group, it is still relevant to emphasize that the numbers of words failed to be recognized due to ANW top the list in two groups with both exceeding 8.10 words on average. This refers to the fact that new L2 vocabulary might pose the biggest threat to listening. This finding reflects the similar view by Vandergrift (2007) that L2 vocabulary might be a significant contributor in explaining variance in L2 listening.

4. Conclusion

Despite careful planning, the study has limitations. The sample size was small; further studies may attempt to replicate the design with a larger sample. Also, they may include participants of different proficiency levels. This might shed light on how language proficiency mediates the relationship between schema activation and word recognition.

In conclusion, this study explored the effect of schema-activation on word recognition. It found that the pre-listening activity of schema-activation has an effect on both the quantity and quality of word recognition. In addition, words difficult to recognize due to phoneme misidentification, comprehension incongruity, concentration on what precedes and sound variation in connected speech are rendered more approachable.
References


**Appendix  Questionnaire**

_Name:_

This questionnaire intends to look into why some words fail to be recognized during listening. Please read the tape script carefully, underlie the words you fail to recognize and number them. Then, put the number in the brackets corresponding to different reasons explaining failed recognition.

a. A word fails to be recognized due to the wrong impression of its pronunciation.

( )

b. A word fails to be recognized due to the variations of its component sound(e.g. assimilation, reductions and elisions) in speech stream.

( )

c. A word fails to be recognized due to the misidentification of the phoneme (Please specify which word you mishear it as).

( )

d. A word fails to be recognized due to the unfamiliarity with its meaning (i.e. familiarity with its pronunciation only).

( )
e. A word fails to be recognized due to its incongruity with the so-far understood idea of the listening material (Please specify briefly why you refuse to accept this word).

f. A word fails to be recognized due to the contemplation on the preceding material.

g. A word fails to be recognized due to it being a completely new word.

(Copy editing: Linell Davis)