Language-specific listening

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Languages differ in their phonological structure and psycholinguists have begun to explore the consequences of this fact for speech perception. We review research documenting that listeners attune their perceptual processes finely to exploit the phonological regularities of their native language. As a consequence, these perceptual processes are ill-adapted to listening to languages that do not display such regularities. Thus, not only do late language-learners have trouble speaking a second language, also they do not hear it as native speakers do; worse, they apply their native language listening procedures which may actually interfere with successful processing of the non-native input. We also present data from studies on infants showing that the initial attuning occurs early in life; very young infants are sensitive to the relevant phonological regularities which distinguish different languages, and quickly distinguish
whether the last of three nonsense items (pronounced by native speakers of Dutch) most resembled the first or the second item. French listeners performed significantly worse than Spanish listeners when the decision was based on stress (bope′lo, bo′pe′lo, bo′pe′lo), but significantly better than Spanish listeners when the decision was based on segmental structure and required that stress variation be ignored (sape′lo, bo′pe′lo, bope′lo; see Fig. 1). French listeners’ “deadness” to stress is not due to unfamiliarity with the acoustic contrast per se, since inter-syllable differences in accent do occur in French. However, in French, such differences never distinguish one word from another; in consequence, listeners may ignore them.

Speakers of Spanish and French show similar sensitivity to the syllabic structure of utterances in various psycholinguistic tasks, but speakers of Japanese are sensitive to another unit: they automatically group phonemes into morae—subsyllabic units consisting of a vowel, a CV or a syllable-final consonant. Importantly, these studies showed that listeners parse foreign language input using their native units. For example, French listeners segment Japanese in terms of syllables, while Japanese listeners impose a moraic structure on English, French and Spanish words.

Another dimension in which languages differ concerns cues to word boundaries: speakers do not pause between words or otherwise provide definitive cues to word boundaries, yet listeners nevertheless have the impression of hearing speech as a sequence of individual words. The way that this efficient segmentation occurs also differs across languages. Thus, in English and Dutch, most words begin with strong syllables (syllables containing an unreduced vowel) and, indeed, listeners treat strong syllables as likely to be word-initial and weak syllables as likely to be word-internal. Such a strategy is simply not available in languages where the strong-weak distinction is not used. Similarly, Finnish listeners exploit vowel harmony in speech segmentation, but obviously this is not possible in languages without vowel harmony. We expect that whatever
boundary between the /d/ and the /s/ in /datr/ as in /bad string/. Nine-month-old Dutch babies prefer to listen to lists of Dutch syllables that respect the phonotactics of Dutch (e.g. /bre/f, /mut/) rather than to lists of impossible syllables in Dutch (e.g. /feth, /rut/). When Dutch and American nine-month-old babies are played lists of Dutch and American words that differ only in their phonotactics, they prefer to listen to the words from their native language (e.g. Dutch but not English allows 'vi' word-initial clusters such as in /vlamdine/; English but not Dutch allows a word-final voiced consonant such as in /hubbub/). American nine-month-old babies also prefer to listen to lists of English monosyllables that contain frequent rather than infrequent phonetic patterns. Most of these findings do not hold true when six-month-old babies are tested, indicating that this learning occurred at some point between six and nine months of age.

Conclusions

So far, we have only been able to present studies relevant to sound patterns. We anticipate that similar studies will appear on other aspects of language processing such as morphology, syntax and possibly even semantics. We have reviewed a number of studies that illustrate the importance of language-specific procedures and representations. We have also shown when some of these language-specific devices are acquired.

A number of important issues remain to be explored by future research. For instance, currently we are investigating whether bilinguals can master equally well the specific processing routines that correspond to the two languages. Earlier research indicates that bilinguals have a dominant processing routine (corresponding to one of the languages). We do not know whether early and equivalent exposure to two languages can produce two routines (one for each language mastered), each similar to that used by monolinguals. Also, we are exploring whether the cortical zones that mediate language processing in monolinguals are the same as those involved when moving either one of the languages in bilinguals.

References

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