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Phonetic Similarity and Trademark Law

Daniel A. Dinnsen
Indiana University

The construct 'phonetic similarity' is fundamental to phonology and phonetics and is an appropriate concern in many linguistics courses. It happens that the construct is also critical to certain points of law, most notably trademark law. Under federal and state statutes, the name of a product or service is protected against infringement by others where the similarities are such that confusion between names (and thus products) could result. The law considers similarity in the sound of two product names to constitute an important factor contributing to confusion. Thus, a proposed product name may illegally infringe on an established name if it is judged to be too similar in sound. However, the law sets out no explicit or objective criteria for assessing phonetic similarity and likelihood of confusion. The Courts do nonetheless allow expert testimony from linguists on this point.

The purpose of this paper is to present objective measures from linguistics and cognitive psychology as criteria for assessing phonetic similarity and likelihood of confusion. These criteria have been successfully applied in several recent court cases and thus illustrate the application of linguistics to law. This paper should also serve as a means for illustrating to students the basic linguistic properties that constitute similarity in sound.

Trademarks are presumed to be unique and highly distinguishable signifiers. A good trademark name would be one that employs highly distinctive speech sounds in a sequence or context that ensures the unambiguous identification of the name. The basic structural properties of speech sounds provide a basis for describing and comparing competing marks. However, a determination must be made about which properties of speech are most basic to distinctness and which phonetic differences are least salient perceptually. This implies, correctly I believe, that not all phonetic differences are of equal weight. After all, any distinctive feature system groups sounds into major classes, and often those classes also serve to specify the most common domain of phonological rules. Furthermore, neutralization rules typically obliterate only certain distinctions but not others. That is, they typically neutralize place, voice and manner differences among consonants but rarely neutralize the distinction between obstruent and sonorant consonants. Also, neutralizations are most common in only certain contexts, e.g. word-finally. From a phonological perspective, at least, there is reason to believe that certain phonetic differences in certain contexts may contribute more to distinctness than certain other phonetic differences.

Objective criteria for assessing phonological similarity and confusability were first developed and applied in a controversy over two radio station call letters, WMEE / WMCZ (Pathfinder Comm. Corp. v. Midwest Comm. Co.) and have since been applied in several other cases. These criteria are summarized in Dinnsen, Fenton & Ehinger (1985). They relate to structural properties of the signal and draw on important psychological research which specifies likely confusions among speech sounds and the effects of context on speech perception and word recognition.

Any proposed trademark (including call letters) can be examined in terms of these criteria.

Radio and television station call letters constitute one very interesting and legitimate type of trademark (or servicemark) entitled to protection under the law. Call letters involve a fixed series of alphabetic letters. Each letter has a pronunciation involving several speech sounds (consonants and vowels) strung together forming at least one syllable. The structure of the syllable may be either open or closed. Call letters are different from other marks, however, in that they constitute a relatively small set of possible marks compared with other possible product names. That is, the constraints on call letters are considerable: they cannot exceed four letters, the first letter must be K (west of the Mississippi) or W (east of the Mississippi), they employ only a limited set of English consonant and vowel sounds (e.g. they exclude [θ ð š ž ɹ æ ʊ ɔ], no letter begins with a liquid or nasal consonant, and no letter ends with an obstruent stop (except the letter H). Other product names are limited only by the constraints on English phonology. The task of assessing similarity and likelihood of confusion is thus easier in the case of call letters since it should be possible to identify all call letters that share certain structural properties. Call letters would be judged highly similar if they share important structural properties.

The following presents the basic structural properties of speech sounds that can serve as measures of similarity and confusability:

Number of segments (or sounds). Phonetic transcription represents speech as a segmentable series of discrete speech sounds. Every utterance, mark or alphabetic letter is comprised of at least one or some number of segments or sounds. Comparing marks in terms of the number of segments is a measure of the length and internal complexity of the marks.

Number of syllables. A syllable is a structural unit which groups sounds together in a systematic hierarchical fashion. Moreover, the syllable unit may even be more accessible perceptually than a segment. For purposes here, syllables may be identified and counted by the occurrence of resonant peaks or vowels. Each letter of the alphabet is spoken as one syllable (except W, which is comprised of three syllables). Comparing marks in terms of the number of syllables is also a measure of the length and internal complexity of the marks.

Serial Order. Marks are composed of sequentially ordered segments and syllables and can, thus, be compared in terms of the relative order of their constituent parts. For example, the following are identical except for serial order differences: 'fist' / 'fits' (the final two segments differ in serial order) and 'WVBT' / 'WVTB' (the final two syllables differ in serial order). Certain differences in serial order are more or less likely to contribute to confusion. A sequence of phonologically similar units (such as the alphabetic letters P T B D V G) are difficult to recall in the order presented and are thus highly confusable (Conrad 1964, Conrad & Hull 1964). The consequence is that two marks differing in the serial order of phonologically similar units are likely to be confused. On the other hand, serial order differences involving phonologically dissimilar units are less likely to be confused. Similarities or differences in serial order thus provide a basis for comparing marks, but not all serial order differences contribute equally to a likelihood of confusion.

Syllable structure. Syllables are of two basic types, namely <u>open</u> and <u>closed</u>. Open syllables end in a vowel or glide, while closed syllables end in a consonant or consonant cluster. For example, the pronunciation of the alphabetic letters B, C, D, E, G, P, T, V, Z would be

characterized as open syllables. The pronunciation of the alphabet letters F, M, N, S, X would be characterized as closed syllables. Marks can be compared in terms of the similarity of their syllable structures. Syllable structure is just one of several properties that contributes to the assessment of phonological similarity and likelihood of confusion. Marks comprised of syllables with the same structure are, thus, more similar to one another than marks differing in syllable structure. It remains to be determined by experimental test whether similarity in syllable structure will lessen the likelihood of open syllables being confused with closed syllables. There is the suggestion from Luce (1986) that the addition of noise to the signal will result in confusions between open and closed syllables. This seems less likely, however, in the case of call letters since they involve alphabetic letters. That is, alphabetic letters tend to be confused with other letters having the same vowel quality and syllable structure (Conrad 1964, Conrad & Hull 1964). With one exception, alphabetic letters with a given vowel quality do not differ from one another in terms of syllable structure. The one exception is the letter H [ʔeyč]. H has the same vowel quality as the letters A, K and J but is a closed syllable; A, K and J are produced as open syllables.

Type of segments. Speech sounds are differentiated from one another in terms of the articulatory and/or acoustic properties that comprise them. While speech sounds differ from one another in some respects, they also exhibit certain similarities to one another. For both phonological and perceptual reasons, all speech sounds are described as being members of one of two major classes, either consonants or vowels. Within the class of consonants, there is one major subdivision of importance. That is, there are two basic classes of consonants - obstruents, on the one hand, and sonorants, on the other. The class of obstruents includes, for example, the speech sounds [p b t d k g s z f v č ǰ θ ð š ž] and glottal stop [ʔ]. The class of sonorant consonants includes nasal (e.g. [m, n] and liquid consonants (e.g. [l, r]. With regard to consonant confusions, Miller & Nicely (1955) have found that certain consonant sounds are more confusable than others. Specifically, consonants that differ in place of articulation (e.g. [p t k]) and manner of articulation (e.g. [t] vs. [s] or [f] vs. [p]) are highly confusable under conditions of noise or high frequency filtering. Consonants that differ in terms of sonorance (e.g. [b] vs. [m] are not especially confusable. The consequence is that obstruent consonants are highly confusable with other obstruents, and sonorant consonants are highly confusable with one another. However, obstruent consonants are not generally confusable with sonorant consonants. For example, then, all other things being equal the alphabetic letters M and F would not be especially confusable since their syllable-final segments differ in sonorance.

Vowels constitute the other major class of speech sounds and are described in terms of vowel quality distinctions, e.g. [a] versus [u] as in 'hot' versus 'hoot'. Certain alphabetic letters are pronounced with the same vowel quality, e.g. P T B V. These letters are highly confusable with one another given their similarities; they are only different in terms of beginning with different obstruent sounds. Recall that differences between obstruents are not very perceptible. Alphabetic letters can also differ from one another in pronunciation in terms of vowel quality, e.g. P versus K. It is well established that acoustic differences associated with vowel quality are perceptually robust (Bladon & Lindblom, 1981; Hood & Poole, 1980; Pickett, 1957). In other words, alphabetic letters or marks differing in vowel quality are not especially confusable. Consequently, the type of sounds

being compared is an important factor in assessing phonetic similarity and confusability since not all phonetic differences are of equal value.

Where phonetic differences occur. There has been considerable psychological research establishing phonetic context as an important factor in speech perception. Specifically, phonetic differences at the beginning of words are perceptually more salient than the same phonetic differences at the end or in the middle of words (e.g. Cole & Jakimik, 1980; Marslen-Wilson & Welsh, 1978; Grosjean, 1980; Salasoo & Pisoni, 1985). Thus, two marks are more likely to be confused if phonetic differences occur late in a word. For example, the phonetic difference (place of articulation) between 'tray/prey' is more perceptible than the difference between 'rape/rate'. For the same reason, it is not surprising that phonological neutralizations are most common word-finally.

These criteria also have implications for the issue of visual confusion. The psychological literature clearly establishes (1) that the confusion errors made in listening to sets of alphabetic letters are the same confusion errors made in visual memory (Conrad, 1964) and (2) that when sets of letters with high phonological similarity are presented visually, they are more difficult to recall correctly than sets of letters with low phonological similarity (Conrad & Hull, 1964).

It follows from the criteria above that certain alphabetic letters will be highly confusable. Table 1 presents the six sets of confusable letters. Letters within a set are highly confusable with one another; letters from different sets are not especially confusable, primarily due to differences in vowel quality across sets. For example, the nine letters in the first set are highly confusable with one another due to their structural similarities: the pronunciation of each letter is one syllable, three segments, open syllable structure, identical vowel quality, and each begins with an obstruent. While there are differences in place, voice and manner of articulation regarding the initial consonant of each letter, it will be recalled that such differences are highly confusable under conditions of noise and/or filtering. The differences that do exist are not sufficient to insure an unambiguous response in a perception or recall task. Consequently, call letters such as WMEE/WMCZ (Pathfinder v. Midwest Comm.) and WBOC/WBOT (Draper Comm. v. Delaware Valley Broadcasters) that differ by letters from the first set would be judged highly confusable.

While the letters of the third set are confusable with one another, they are not especially confusable with letters from, for example, the first set. The reason that the sets are not confusable is because these two sets differ by vowel quality and syllable structure. More specifically, the third set is characterized by a mid front lax vowel in a closed syllable. On the other hand, the first set is characterized by a high front tense vowel in an open syllable. There is only one other set of letters that is structurally similar to set 3, i.e. set 4 (M N L). However, all other things being equal, sets 3 and 4 are not especially confusable since the final consonant of the syllable is an obstruent for set 3 and a sonorant for set 4. Thus, the most similar set of letters to set 3 (i.e. set 4) is not especially confusable with set 3.

Conclusion. A determination of phonetic similarity depends on linguistically defined structural properties of speech sounds. Certain phonetic differences are more basic than others in terms of distinctness and perceptual salience. That is, major class differences (obstruent versus sonorant consonant, different vowel qualities) contribute to distinctness. However, phonetic differences among sounds within those classes (place, voice and manner of articulation) do not generally contribute to distinctness and would thus be considered highly similar. There are

Confusable Sets of Letters

1. B C D E G P T V Z
   [biy] [siy] [diy] [ʔiy] [ǰiy] [p^hiy] [t^hiy] [viy] [ziy]

2. A K J
   [ʔey] [k^hey] [ǰey]

3. F S X
   [ʔɛf] [ʔɛs] [ʔɛks]

4. M N L
   [ʔɛm] [ʔɛn] [ʔɛl]

5. I Y
   [ʔay] [way]

6. Q U
   [k^hyu] [yu]

Table 1

important linguistic differences between open and closed syllables. Differences in serial order contribute to distinctness if phonetically dissimilar sounds are involved. The context in which phonetic differences occur is very important to the assessment of similarity and confusability. That is, phonetic differences of whatever kind at the end of a word do not contribute to distinctness.

One area of the law, namely trademark law, draws crucially on the assessment of phonetic similarity and likelihood of confusion. Linguistics thus finds applications in law.

Exercises

1. The Courts have in some instances maintained that marks which rhyme are phonetically similar. What are the structural properties of words that constitute rhyme?

2. What would be the effect of background noise or music on a listener's identification of call letters?

3. Very often call letters are announced in conjunction with a station or channel number with the expectation that listeners will make a paired association between the two. Would you expect 'paired associate learning' to be more difficult with phonologically similar call letters?

4. Using the criteria set forth above, evaluate the phonological similarity and likelihood for confusion of the following marks: (a) two drugs for motion sickness, 'Dramamine / Bonamine', (b) jeans (in one instance for overweight women) 'Jordache / Lardashe', (c) radio station call letters, 'WVST / WVTS', (d) call letters for a television and radio station, respectively, 'WTTV Channel 4 / WTTS-FM 92', (e) soft drinks, 'Slice / 's nice' (as in 'it's nice!'), (f) foreign cars, Hyundai / Honda.

5. Call letters east of the Mississippi begin with W; west of the Mississippi, they begin with K. (a) Assuming that all call letters are comprised of four letters, how many logically possible call letters are there? (b) Given the list of confusable letters above, how many call letters in principle are confusable with WTPB? In contrast, how many call letters are confusable with KROW?

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