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in Manual of Phonetics, ed. C. Kaiser,
1957, Amsterdam, p. 100.

scores were associated with the more familiar words [5]. Since the phonetic units of English apparently occur in approximately the same proportions in various kinds of material (school textbooks, newspaper prose, public address, advertising, etc.), the implication of the data of Table IV is that a phonetic element has a greater chance of being identified when it occurs in a more familiar word rather than in a less familiar one. This introduces for the psychologist a variable in any formula that would predict the intelligibility of a word from the intelligibility of the constituent sounds.

Words differ in the number of their phonetic elements and in syllabication; also in the position of the stressed or accented syllable. Table V shows that longer words are relatively more intelligible than shorter ones; and that two-syllable words are more intelligible than one-syllable words [5]. These data imply that the reception of a phonetic element varies also as a function of the complexity of the phonetic environment of the sound, another concern for the psychologist.

The accuracy of reception of the phonetic unit seems to vary as a function of the place of accent in the word. For example, of the two-syllable words summarized in Table V the ones with an accent on the second syllable were statistically significantly more intelligible than the ones with the accent on the first syllable (72% vs. 67.1%; $t, 6.16$).

TABLE V

Mean intelligibility scores of words containing various numbers of sounds

	Number of Sounds								
	1	2	3	4	5	6	7	8	9
One-syllable	—	54.9	56.2	58.3	63.0	67.7	—		
N	1	92	679	628	143	7	1		
Two-syllable			63.4	66.5	68.9	69.1	70.7	74.2	—
N			47	528	765	555	196	58	2

Since intelligibility of the constituent phonetic units of a word varies (a) higher with the more familiar words, and (b) higher with the longer words, a question arises as to whether these influences tend to supplement each other in the perception of oral language or to counteract each other. A chi-square test of independence was made on a population of approximately 3,700 English words, with familiarity (Thorndike ratings) represented in successive columns and number of phonetic units per word, in rows. The test showed that the two variables were not independent, the more familiar words tending to contain the smaller number of speech sounds (chi-square, 531.4 with 56 degrees of

freedom). Thus, the pair of influences operate in opposite directions in affecting the reception scores of the phonetic elements.

These paragraphs may be interpreted to emphasize the necessity for the psychologist to work with the reception of the phonetic unit in a context of a homogeneous population of words. The absolute judgment that is involved in the measurement is obviously influenced by the state of prior learning on the part of the observer. This factor has contributed to the use of multiple-choice intelligibility tests in testing personnel and equipment [6], [7], [30]. In these tests the observer is asked to identify which of the group of four specified words he hears. When intelligibility testing is conducted by means of structurally homogeneous lists of monosyllables the differences attributable to learning are minimized by giving the subjects extensive practice with the vocabulary of the tests [12].

e. The Sound in a Meaningful Unit: the Sentence

The phonetic unit is more readily identified when it occurs as an element in a sentence than when it stands as a part of an isolated word. The materials from two independent investigations summarized in Fig. 2 show that the phonetic units of the same English words were not equally intelligible in isolation and in sentences unless the words in isolation were given a 6-db increment in signal-to-noise ratio [36], [39]. The advantage that accrues to the reception of the phonetic unit in the sentences is attributed to semantic context, an extended instance of the phonetic context that accounts for the higher recognition score of the phonetic element in the word than in the nonsense syllable.

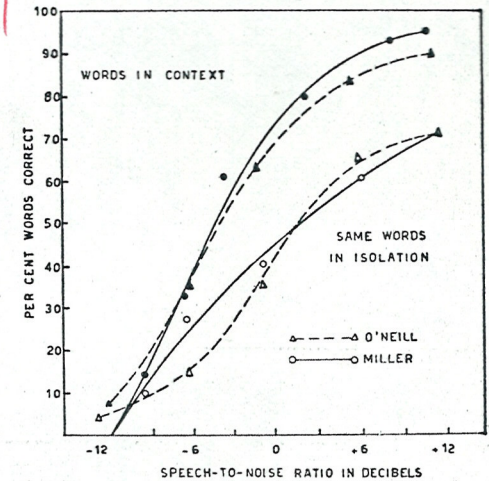


Fig. 2. The effect of sentence context upon the intelligibility of words in various signal-to-noise ratios. (From MILLER, HEISE and LICHTEN [36] and O'NEILL [39]).