WORD VALUES, WORD FREQUENCY, AND VISUAL DURATION THRESHOLDS

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A number of studies have shown a relation to exist between word frequency, word value, and visual duration thresholds. Certain issues have developed concerning the interpretation of the observed relations. Two types of interpretation of results can be distinguished:

1. Those interpretations that claim word frequency to be the major determinant of visual duration threshold. This point of view contends that the responses made to the tachistoscopic presentation of words are learned in the same manner that other responses are learned. Differences in the visual duration thresholds of words can then be accounted for in terms of word frequency so that the introduction of such tenuous and "unanchored" variables as perceptual selectivity and perceptual defense is a violation of the law of parsimony. Thus, the problems that exist with regard to the differential visual duration thresholds of words are problems in learning, not problems in perception.

2. Those interpretations that attempt to show that differences in the visual duration thresholds of words are due, all or in part, to differences in the affective qualities (values, goodness--badness, affective tone, emotional valence) attached to words. These affective qualities affect visual duration thresholds directly, through perceptual selectivity and/or perceptual defense. Visual duration thresholds of words are determined by variables that can be called perceptual variables instead of or along with those variables that usually bear upon learning.

We wish to center our introductory discussion around those few studies which, for us, best exemplify the two positions described above. Solomon and Howes (1951) take the position that differences between words can be accounted for on the basis of word frequency. The perceptual process does not differ in any fundamental way from the learning process. They say:

Emotional factors undoubtedly operate to an important extent in the building of word frequencies in a given life history. In this way they would be related to word frequency and, indirectly, to the duration thresholds. . . . But to date we can find no evidence to suggest that emotional factors operate in the tachistoscopic situation independently of their effect on word frequency (p. 267).

According to Solomon and Howes (1951, p. 258) visual duration threshold can be accurately predicted from a knowledge of population-wide word frequency as given in the Thorndike-Lorge tables (1944). There is no need to bring in concepts such as perceptual selectivity or perceptual defense in order to explain differences in visual duration thresholds of words. To Solomon and Howes emotional factors operate only in producing idiosyncratic variation in word frequency. These differences in frequency account for differences in the visual duration thresholds of words such as those found between the visual duration threshold of a value-oriented word for subjects (S's) who score high as opposed to low on specific scales of the Allport-Vernon Study of Values. They do not have any other influence on visual duration threshold.

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The second position concerning the relation between word frequency, word value and visual duration threshold is clearly expressed by Postman and Schneider (1951). Faced with the problem of salvaging value as a variable influencing visual duration threshold, they say that

It may . . . be more profitable theoretically to regard both frequency of word usage and duration thresholds as dependent variables, both manifestations of more fundamental psychological properties attributed to the organism, such as "habits," hypotheses, or even, perhaps, "personal values" (p. 277).

While not denying that word frequency can account for a considerable proportion of the variance in visual duration thresholds of words, they claim that values (called directive factors in this paper) directly influence the visual duration thresholds of infrequent words.

Postman, in a later article (1953), suggests that the frequency of usage of a specific word is determined by its reinforcing qualities. He suggests that frequent as opposed to infrequent words differ systematically in affective tone. He presents evidence to show that the sheer number of pleasant words is much greater than that of unpleasant words. Postman says, "Social control over environmental stimuli will, then, tend to create a correlation between frequency and positive value" (p. 68). Whether called values, directive states, or affective qualities, certain emotive or affective aspects of words influence their general (e.g., Thorndike-Lorge) frequency. Affective quality determines frequency, not merely in an idiosyncratic way as Solomon and Howes (1951) suggest, but also in a very general sense for all words used by all individuals.

It has been hypothesized from this second position that values can influence visual duration threshold in two ways. The affective qualities of words influence visual duration threshold directly as in the case of an S's Allport-Vernon score influencing his thresholds for infrequent value oriented words (Postman & Schneider, 1951). (It has been shown that the S who values an area such as aesthetics highly reports infrequent "aesthetic" words at lower thresholds than an individual who does not value aesthetics highly. However, as Solomon and Howes point out, this may be due to "idiosyncratic" differences in frequency of exposure.) The affective qualities of words influence visual duration threshold indirectly, since the frequency of general usage of any word is determined to a considerable extent by the affective tone of that word, with this frequency then acting as a determiner of visual duration threshold (Postman, 1953).

A third position might also be taken concerning the relations between word frequency, word value, and visual duration threshold. Postman (1953) touches upon this last possible interpretation. He says, "Finally, we cannot entirely discount the possibility that familiarity resulting from frequency may be in itself a source of positive value" (p. 68).

It appears, historically, as if the first point of view—that emphasizing word frequency, playing down the influence of value except as it produces idiosyncratic differences in word frequency—has won out. None of the three positions described above have been proven to be untenable, however. Indeed, we have all of the original questions left, plus a few new ones as well. The questions that we see as being testable and requiring further investigation are these:

1. Is word value related, in a general sense, to word frequency? All of the three positions described above would admit the existence of a relation between value and
frequency—they would diverge in opinion with regard to the generality of the relationship. It is true that a knowledge of word frequency allows us to predict visual duration threshold. But why is the frequent word frequent? Perhaps we should go one step beyond frequency to determine whether other attributes of words vary systematically with frequency.

2. If a general relation between value and frequency exists, does it exist because more positively valued words are used more frequently or because one increases positive affect merely by increasing frequency? Or does the dependent-independent relationship depend on the experimental procedure used?

3. If value and frequency are related in a general, not merely an idiosyncratic sense, then one would have to separate out the influences of each on visual duration threshold. Are there significant differences in visual duration threshold between “good” and “bad” words of equal population-wide frequency? Are there significant differences between frequent and infrequent words equal in affective tone?

These are the three problems that we have attempted to deal with in the series of experiments reported below.

Our first concern was to determine whether a general relation exists between word value and word frequency. As we noted above, there is reason to suspect that emotional factors do operate in the building of word frequency. In a large sample of words for which we have actual measures of goodness, the words in the semantic atlas prepared by Jenkins, Russell, and Suci (1958), one finds better than a two to one preponderance of good over bad words. While the words in this atlas are not a random selection of words in the English language, the sources from which the words were selected seem unlikely to be systematically biased in frequency of pleasant as opposed to unpleasant words. One is led to believe that this ratio is characteristic of the entire English language when examining proportions of pleasant to unpleasant words in a sample of 150 words selected at random from the Thorndike-Lorge tables for use in the experiments in Series I, discussed below. Of these 150 words, 95 were on the good end (4.00 or less) of the semantic differential, a ratio of approximately 2:1. It seems highly probable that the sheer number of pleasant words in the English language is far greater than the number of unpleasant words.

It seems equally likely that the frequency with which any specific word is used also depends to a considerable extent on its goodness or badness: hence on its reinforcing qualities. This question is amenable to determination. As Solomon and Howes (1951) state, “In the absence of further data it seems best merely to define word frequency for English words as the frequency of words in the Thorndike-Lorge tables” (pp. 264–265). If affective factors operate in the building of word frequency, then pleasantly toned words should have higher frequencies in the Thorndike-Lorge word count than unpleasantly toned words. Experiment I was designed to determine whether this was the case.

**Experiment I**

In the first of this series of experiments we attempted to determine whether the pleasantness of words—in this case measured by the good–bad scale of the semantic differential—was related to word frequency as measured by the Thorndike-Lorge tables.

We selected a sample of words from the Thorndike-Lorge tables. This sample of words consisted of two words selected at random from within every alphabetic category (except X) in the tables. These words were rated on the good–bad dimension of the semantic differential by 24 Ss, all freshmen taking an introductory psychology course. The rank order correlation between the goodness and the L count frequency of these words was +.63. Another ran-
A random sample of 50 words was taken from the Thorndike-Lorge word list in the manner described above. These words were rated by 28 Ss, a different group than those who made the first set of ratings. The rank order correlation between goodness and L count frequency in this list was +.40, again significant to the .01 level of confidence. A third random sample of 50 words was drawn from the Thorndike-Lorge tables. These words were rated by 24 Ss, none of whom had taken part in previous experiments. The correlation between L count frequency and goodness for this set of words was +.38. All of these three correlations are significant to the .01 level. The results of these experiments, regardless of differences in the magnitude of the correlations, indicate that there is a positive and significant correlation between word frequency and goodness. Value attributes of words are related to word frequency—and not merely in an idiosyncratic way, but in a far more general sense as well.

**Experiment II**

Solomon and Howes (1951) list 30 frequent and 30 infrequent words that they used in a study of the relation of word frequency to visual duration threshold. Five frequent and 5 infrequent words had to do with each of the six value areas of the Allport-Vernon Study of Values. Frequent and infrequent words were sometimes, but not always, synonymous. We paired these words, matching the first frequent with the first infrequent word, and so on, through the two lists. Position of presentation within pairs was determined by coin flip. These 30 pairs of words were presented to 34 freshman introductory psychology students, none of whom had taken part in any previous psychological experiments. Ss were told to “encircle the most pleasantly toned word of each pair.” In 26 of the word pairs, the more frequent word was chosen by the majority of the Ss as the most pleasantly toned. (The 4 exceptions, in which the least frequent word was chosen as the more pleasantly toned, were the word pairs limousine-automobile, economics-assets, orchestra-ensemble, and celestial-heavenly.) A sign test (Guilford, 1956, p. 248) indicates that this preference for the more frequent word in each pair could occur by chance less than one time in a hundred. Again, the more frequent word is rated as the better word.

In the experiment discussed below we attempted to determine whether frequency and goodness were related when nonsense syllables were used as stimulus materials.

**Experiment III**

Twenty-two Ss rated two separate visually represented lists of nonsense syllables for goodness, as measured by the semantic differential. An interval of one week separated the ratings of the two lists. Each list consisted of eight 100%, eight 47-53%, and eight 0% association value (Glaze, 1928) nonsense syllables in random order. Syllables were selected at random from within each block of ten Glaze syllables as listed in the *Handbook of Experimental Psychology* (Stevens, 1951, pp. 540-546) at each of the association values used. Then the eight syllables used in each list at each association level were drawn from this pool of randomly selected syllables. We believed that if frequency of exposure was related to goodness, then the higher the association value of the syllable, the better the syllable should be rated. This seemed likely, since the association value of nonsense syllables appears to be determined largely by the frequency of occurrence of the letter combinations in meaningful words (Underwood,
1959). Table 1, showing two sets of syllables and their mean ratings of goodness, indicates this to be the case.

A Mann-Whitney (1947) test of the significance of differences between syllables of 100% and 47-53% association values in List 1 indicates that the 100% list is rated as somewhat better \((P < .10)\). The difference in goodness between 47-53% and 0% syllables is significant \((P < .01)\); Mann-Whitney tests of List 2 show the 100% and the 47-53% list to differ in goodness \((P < .01)\); and the 47-53% list and the 0% list to differ significantly \((P < .05)\) as well.

Just as the goodness and the frequency of meaningful words in the English language are related to one another, so also is goodness related to the association value of nonsense syllables; the higher the association value, the better the syllable.

Our data indicate that value and frequency are related. We have moved at

<table>
<thead>
<tr>
<th>List 1</th>
<th>100% Syllables</th>
<th>Rating</th>
<th>47-53% Syllables</th>
<th>Rating</th>
<th>0% Syllables</th>
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<td>4.33</td>
<td>XW</td>
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<td>VOZ</td>
<td>4.30</td>
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<th>47-53% Syllables</th>
<th>Rating</th>
<th>0% Syllables</th>
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<tbody>
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Least somewhat beyond the empirical fact that word frequency is related to visual duration threshold. We know something else about the stimulus qualities of frequent as opposed to infrequent words; frequent words are not only more frequent but are better as well. Our second question then becomes relevant. Does a manipulation of frequency cause systematic variation in value or do differences in value produce differences in word frequency, or does the independent–dependent status of each of these variables vary depending on the experimental procedures used? Experiment IV bears upon this question.

**Experiment IV**

Fourteen Ss rated the goodness of twenty nonsense words. These words were from the list of words used by Solomon and Postman (1952) in their study of the effect of “built in” frequency on visual duration threshold. The words used were: JANDARA, AF-WORBU, BIWOJNI, NANSOMA, ENANWAL, IKTITAK, SARICIK, ZABULON, CIVADRA, LOKANTA, KADIRGA, ADAFNAW, BORULCE, NJARON, ENSHIMI, INDULAM, TAVHANE, UDIBNON, DILIKLI, and MECBUR. Mean goodness scores were obtained. One week later each S was tested individually. When the S entered the experimental room he was given the following instructions (from Solomon & Postman, 1952):

This is an experiment concerning the effectiveness of repetition in learning to pronounce strange words correctly. It has a direct bearing on the problem of reading words in a foreign language, as compared to hearing the words spoken. In addition, we are interested in knowing whether the relative effectiveness of the two kinds of learning methods depends on general reading ability.

We are going to give you a deck of cards. On each card is printed a strange word. We would like you to look at each card carefully and then pronounce the word in the way it would be pronounced if it were a word in the
English language. Proceed steadily from card to card, turning over each one after you have finished with it. Go right through the deck and then stop unless you have serious doubts about your pronunciations.

The experimenter (E) handed the S a pack of 90 3" × 5" cards. In this pack were the words listed above. The first five words above were presented 10 times apiece, the next five, 5 times apiece, the next five, 2 times apiece, and the last five, once each. The cards were shuffled thoroughly after each S completed this task, so that they were in a relatively random order.

All responses were taped in order to lend realism to the expressed purpose of this new situation. Since Ss had participated in another experiment on the pronounceability of words, it seems likely that (although the Ss had seen the words before while rating them on the semantic differential) they were misled as to the purpose of this experiment. Each S rated the nonsense words a second time following this pronounceability test.

Figure 1 indicates the mean pre-exposure and postexposure ratings for words of each frequency of exposure. While the differences between ratings prior to exposure were not significant, a Kruskal and Wallis H test (1952) shows that words of differing frequencies of exposure do differ significantly in the postexposure test (P < .01, H = 7.83).

In this experimental situation a manipulation of word frequency alters Ss' evaluations of word goodness. One can, however, think of instances where the reverse might well occur. The most obvious example of this is in verbal conditioning, where the differential reinforcement of a class of words produces systematic variation in the frequency with which this class of words is emitted. We would suspect that in this case frequency of emission (and hence of reinforcement) alters the affective quality of the words. Reinforcement might then produce further variation of frequency.

No matter whether frequency of exposure alters value or vice versa, or both, one thing is evident—there is a relation between word frequency and Ss' ratings of word goodness. Since this is so, our third question also becomes relevant. Since value and frequency are generally related, it became necessary to experiment with samples of words matched in frequency, varying in goodness, plus samples of words varying in frequency, matched in goodness, in order to separate out the influence of value and of frequency on visual duration threshold. This was attempted in Experiment V.

**Experiment V**

We had various groups of Ss rate the goodness of a large number of words on the semantic differential. These groups rated 60 words of a Thorndike-Lorge G count of 12, 13, or 14, three random samples of 50 words each (described in Experiment I), and 39 words, one sample of 30 words plus
9 words which happened to appear on the other lists, from Jenkins' semantic atlas. From these words, and from Jenkins' atlas, we selected 17 pairs of words matched in frequency, varying in goodness, and 17 pairs of words matched in goodness, varying in frequency. (Some words among those matched in goodness were rated by Jenkins' Ss and by our own. Although the rank order correlation of goodness ratings between our own and Jenkins' sample of Ss was +.98, for a group of 30 of these words, there was some variation in ratings between the two samples. Whenever this occurred, we used the mean goodness rating assigned by our Ss.) The first 9 words from each list were presented to the first group of 26 Ss; the last 8 to a second group of 23 Ss. The four lists of words, divided as they were presented to two sample populations, are presented in Table 2.

The words were put on slides in the form of bold faced capital letters. The words were presented to Ss by means of a Revere 888 tachistoscope. Each S sat 18 feet from the screen on which the words were projected. The testing room was fully illuminated while the tachistoscope was used at the smallest possible lens opening. The ratio of room illumination to screen illumination was 1:1.08. The words were presented in random order with the order remaining constant in all presentations to any specific S but with the order varying between Ss. A modified method of limits was used in which each of the 36 words was presented once at each of the following speeds: 1/100, 1/50, 1/25, 1/5, 1/2, and 1 second. Under the conditions of presentation used in this experiment, only one word was recognized at 1/100 of a second while all words were recognized at 1 second.

Each S's mean visual duration threshold for frequent as opposed to infrequent and good as opposed to bad words was obtained. The Ss in the first sample (N = 26), exposed to the first group of words, differed significantly in mean thresholds for good vs.
bad words \((t = 3.56, P < .01,\) using the formula for correlated data), with good words reported at lower thresholds. These Ss also differed in mean thresholds for frequent vs. infrequent words \((t = 2.33, P < .05),\) with frequent words reported at lower thresholds. The Ss in the second sample \((N = 23),\) exposed to the second group of words, differed significantly in mean thresholds for good vs. bad words \((t = 3.25, P < .01),\) with good words reported at lower thresholds, and in threshold for frequent vs. infrequent words \((t = 3.82, P < .01),\) with frequent words reported at lower thresholds.

**Discussion**

We attempted to obtain data relevant to three specific questions. Let us look at these questions, along with the relevant data.

1. Is value related, in a general sense, to word frequency? Our data is unequivocally affirmative. Whether dealing with samples of words in the English language, with frequent vs. infrequent words in various Allport-Vernon value areas, or with nonsense syllables, frequency, as measured by the Thorndike-Lorge tables and by association value, and positive value, as measured by the good-bad scale of the semantic differential, are significantly related in a general sense.

2. If this general relation exists, does it exist because more positively valued words are used more frequently or because one increases positive value merely by increasing frequency? We found that a manipulation of frequency produces systematic variation in Ss' ratings of the goodness of words. It seems highly probable, however, that the reverse may also be true—that by increasing the goodness of words, one also increases frequency. At this point it seems likely that the independent-dependent relation between goodness and frequency would depend on the experimental situation. We would not hazard a guess as to the effect of each on the other in general speech, although a relation between frequency and goodness has been shown to exist.

The data gathered in the first three experiments suggest that other attributes of the stimulus vary systematically as one varies frequency. Perhaps this is true for other forms of learning also. The fourth experiment would suggest the possibility that a manipulation of the frequency of occurrence of a stimulus and a contiguous response, in itself and without any regard to drive reduction, changes the reinforcing qualities of the stimulus. Perhaps we should look beyond the influence of frequency on response probability and ask why frequency changes response probability. Is it the difference in association value (and hence, in frequency of occurrence) that causes 100% association value syllables to be learned more rapidly than 0% syllables? Or is it the variation in affective quality accompanying differing frequencies of occurrence? Since the relation between goodness and frequency is not perfect, one can obtain syllables that vary from 0 to 100% in association value, yet are equal in semantic rating—this should provide a test for our question.

These results seem to have considerable social consequence. If word frequency and word goodness are related, and if a manipulation of the frequency of occurrence of a word produces systematic variation in word value, then one wonders whether ideas and personal values are manipulable in the same fashion. If so, then perhaps those elements of society that believe in censorship would find support in these experiments for one of their major assumptions, viz., that frequent exposure to an idea or a set of behaviors—violence, drinking alcoholic beverages, or what have you—lessens the “evil” associated with the idea of behavior. The validity of their second major assumption—that if we make a thing evil enough, people won't do this thing—is, of course, a very different problem.

If the more frequent becomes demonstrably better merely because it is
more frequent, one can well understand the values of advertising. If it is generally true that the most frequent words in the English language are also the most good, the logical conclusion that this would lead to is that ads would be more effective if written at an even lower vocabulary level than is currently used. "Oh, brave new world. . . ."

3. If value and frequency are related, what are the influences of each on visual duration threshold when the other variable is held constant? Words equal in frequency, varying in value, are correctly reported by S's at different mean thresholds, with good words being correctly identified at significantly lower thresholds than are bad words. Words equal in goodness, varying in frequency, are reported by S's at different mean thresholds, with frequent words being correctly identified at significantly lower thresholds.

While it has been generally accepted that values have some secondary effect on visual duration thresholds, it is also generally accepted that the influence of values on threshold is small, producing idiosyncratic variations in frequency and hence influencing thresholds in this way. Our results indicate that values influence threshold even when frequency of exposure is held constant, and that this influence is approximately equal to that of frequency with value held constant, using these lists of words.

Since word goodness, independent from frequency, does significantly influence visual duration threshold, we are left with the problem of "Why?" The terms "perceptual selectivity" and "perceptual defense" are descriptive, not explanatory. We have no answers here, although we would like to discuss several possible explanations.

One interpretation of the fact that good words are perceived at lower threshold than bad words of the same frequency might be called the "simple" guess theory. Good words appear to be about twice as common as bad words in the English language. Specific good words are likely to be more frequently used than specific bad words. It seems, then, that good words occur between three and four times as frequently as bad words in terms of usage. Even though the frequency of occurrence of the stimuli are equaled, by matching good and bad words for Thorndike-Lorge frequency, response probabilities probably are still not equal. If an S sees a word in a tachistoscope but identifies only a "g—— d——" he is probably three or four times more likely, on the basis of responses made in the past, to fill in the gaps with a good word, such as "gradual," rather than a bad word, such as "gouge." This simple guess explanation may be partially correct but is not too satisfying to us, since an examination of our S's responses to words on the good-bad lists indicates that there seems to be a rather strong likelihood that when S's guess at but miss a bad word, they respond with another bad word—incorrect but still bad, while when they respond incorrectly to the tachistoscope presentation of a good word, the incorrect response is usually another good word. This finding runs contrary to the idea that perceptual defense is a significant variable but also suggests that something more systematic than mere guessing is involved in errors and in correct responses to tachistoscopically presented words.

A second explanation for the differences in S's mean visual duration thresholds might be called the "complex" guess theory. This explanation is derived from Bruner and Postman's (1949) hypothesis theory of perception and cognition. According to Postman (1951) hypotheses are, "in the most general sense, expectancies or predispositions of the organism which serve to select, organize, and transform the stimulus information that comes from the environment" (p. 249). The
strength or availability of certain hypotheses is stronger than that of others. This strength is a function of the following factors: frequency of past confirmation of the hypothesis, number of alternative hypotheses, motivational relevance, and cognitive support. The first two factors—frequency of past confirmation and number of alternative hypotheses—fit well into the simple guess theory, while the last factor, that of cognitive support, may not be relevant to this discussion. The factor of motivational relevance might possibly, however, produce differential predictions between the two explanatory devices that we have labeled simple and complex guessing. As Postman (1951) puts it: "The stronger the motivational support for a given hypothesis, the less of appropriate information is required to confirm it" (p. 255). We would limit this statement somewhat by tying it only to the effect of reward or reinforcement on the number of cues required for the confirmation of a hypothesis. It may be that the differential reinforcement of various stimuli causes those stimuli (as well as those responses) that have most frequently led to reinforcement in the past to be more readily observable or available in the present. The availability of a specific response may well depend on the frequency that this response has been rewarded in the past—but perhaps because that aspect of the stimulus situation that has called forth the rewarded response in the past has become more salient—has become more of a "figure" as opposed to the other stimuli becoming more like the "ground." To paraphrase our quotation from Postman given above: The more reinforcing or rewarding a word is, the less cues are needed for the recognition of this word. We are advancing the proposition that reinforcement not only influences the probability that a given response will be emitted, but also that reinforcement causes that aspect of the stimulus situation that is salient at the time that the rewarded response is made to become more likely to be salient at the next presentation of the stimulus. If this is true, then even if word frequencies of good and bad words are equal and even if habitual modes of response (such as guessing good words) are controlled, the stimulus qualities of rewarding or reinforcing words would be such that less information is needed before the word is correctly recognized than would be the case for words which were presented with equal frequency but were not equally reinforcing. Something that might be called perceptual sensitivity might then be said to exist. This sensitivity would not, however, be a unique perceptual process, but would instead depend on those old standbys in all forms of learning: frequency and reinforcement, a little intermingled to be sure, but still observably present.

We have no way of testing out the "why" question with these data, although the types of wrong guesses made in our study incline us away from the simple guess theory. We believe that the data presented in this study are valuable chiefly in reviving the concept of perceptual selectivity, not in solving the problem of why what is called perceptual selectivity exists. By systematically varying frequency of exposure and frequency of reinforcement and nonreinforcement of nonsense syllables in future experiments, we hope to eventually be able to deal with the question of why good words are perceived at lower mean thresholds than are bad words.

**Summary**

Three positions may be taken concerning the relation between word value and word frequency, and the relation of each of these to visual duration thresh-
old. Two of these points of view would suggest a general relation to exist between word frequency and word value. Three experiments demonstrate the existence of this relationship. The more frequent a word or a nonsense syllable occurs in the English language, the better it is likely to be rated on the good–bad scale of the semantic differential. Since this relation does exist, we attempted to test out, in Experiment IV, one possible explanation of why the relation exists. A manipulation of the frequency of nonsense words produces systematic variation in the rated goodness of these nonsense words. Words that are frequent are also very likely to be rated as good. Hence, to separate out the influence of word value and of word frequency on visual duration threshold, we tachistoscopically presented lists of words matched in frequency, varying in goodness; matched in goodness, varying in frequency. Subjects reported the good words at significantly lower thresholds than the matched bad words; the frequent words at significantly lower thresholds than matched infrequent words. Both frequency and value appear to operate in producing differential visual duration thresholds for words. Possible explanations and certain implications of these findings were discussed.

REFERENCES


(Received September 15, 1959)