

Research Paper

## Response Entropy and Emotional Indicators in the Kent–Rosanoff Word Association Test: Implications for Psychological Assessment

Dr. Sukhdev Singh<sup>1\*</sup>

### ABSTRACT

The Word Association Test (WAT) has long been used in psychological assessment to infer emotional disturbance, psychopathological, and creative processes, yet its diagnostic utility has yielded inconsistent empirical findings. This paper reviews theoretical and empirical evidence addressing a key methodological source of these inconsistencies: stimulus-related variability in response entropy and associative difficulty. Drawing on classic and contemporary studies using the Kent-Rosanoff Word Association Test, the review examines how response entropy systematically influences commonly used emotional indicators, including long reaction time, unique and infrequent responses, response repetition, misremembering, and forgetting. Evidence suggests that several indicators traditionally interpreted as reflecting emotional disturbance are substantially moderated by the response hierarchy characteristics of stimulus words. Indicators such as response repetition and response preservation appear less confounded by entropy effects, whereas emotional indicators, long reaction time, repetition of the stimulus before responding, reproduction failure, and response rarity require cautious interpretation. These findings underscore the importance of incorporating stimulus-level psychometric properties into the interpretation of WAT performance. Implications for assessment practice and test construction are discussed, emphasizing the need for controlled stimulus words selection when using word association test measures in clinical and applied assessment contexts.

**Keywords:** *Word Association Test, Response Entropy, Emotional Indicators, Psychological Assessment, Associative Difficulty*

The Word Association Test (WAT) has a long and well-established history in experimental psychology. Since Galton's pioneering work in 1879, word association tests have been widely employed in psychological research, and their importance cannot be minimized. Historically, the technique was first used by Galton in England and later by Wundt in Germany to investigate associative processes. Galton's findings were quickly recognized by other psychologists; for instance, Cattell and Bryant (1889) compiled relative frequencies of associations to a standard list of words.

<sup>1</sup>Substitute Teacher, Frontline Education (AESOP) VUSD 401 Nut Tree Vacaville CA 95687 USA.

\*Corresponding Author

Received: January 01, 2026; Revision Received: February 20, 2026; Accepted: February 24, 2026

## Response Entropy and Emotional Indicators in the Kent–Rosanoff Word Association Test: Implications for Psychological Assessment

Interest later shifted toward the use of word association for studying abnormal psychological processes, detecting guilt, and revealing hidden thoughts (Münsterberg, Germany). Kraepelin (1892) adapted the method for studying abnormal behavior, initiating a line of investigation that remains active. Although Kraepelin and colleagues studied psychiatric patients, the method's use in personality assessment gained prominence only after Freud emphasized the relationship between word associations and inner needs and conflicts. With the growing influence of psychoanalysis after 1900, the WAT received increased attention as a clinical technique.

Jung and other clinicians used the method extensively to detect psychological complexes rapidly. Jung (1910) proposed a standardized list of 100 stimulus words to facilitate the detection of complexes related to worry and neurotic involvement. The technique was later refined by Jung and by Kent and Rosanoff as a diagnostic tool. Numerous investigators (Hull & Lugoff, 1921; Rapaport et al., 1946; Brown, 1965; DeWolfe & Youkilis, 1974; Kuntz, 1974; Hundal & Upmanyu, 1974, 1981; Penk, 1978; Miller & Chapman, 1983; Upmanyu et al., 1996) have provided evidence supporting the use of word association techniques for studying emotional disturbance and creativity.

Uncommon word associations have long been regarded as indicators of schizophrenic thought. Gough (1976) studied creativity using WAT and concluded that moderately infrequent responses are more strongly related to creativity than extremely remote or very common associations. Upmanyu and Singh (1984) reported that extremely unique word associations reflect two components: one associated with psychoticism and another with creativity, while moderately infrequent associations represent the most reliable indicators of creativity.

### *Diagnostic Utility and Response Entropy*

Despite early promise, many attempts to relate WAT indices to personality traits in normal populations produced equivocal results. Several studies (Meyers & Brecher, 1941; Appelbaum, 1960; Goldstein, 1961; Tecca & Glassco, 1965; Storms et al., 1967; Fuller & Kates, 1969; Andress et al., 1974) reported that WAT failed to differentiate reliably between normal and deviant subgroups, calling its diagnostic utility into question. Schwartz (1978a, 1978b) challenged the assumption that individuals with schizophrenia produce rarer associations than normal subjects.

The variability in findings may be due to inadequate control over variables that influence WAT responses. Laffal (1955) identified **response entropy** as a critical factor, reflecting the diversity and distribution of responses to stimulus words. High-entropy words elicit many different responses, whereas low-entropy words elicit few dominant responses.

Several studies (Wiggins, 1957; Brown, 1965; Kuntz, 1974) demonstrate that WAT performance is influenced by associative difficulty and the response hierarchy of stimulus words. Response faults occur more frequently when many competing responses are available and less frequently when dominant responses prevail. These variables may account for inconsistencies in reported diagnostic utility.

Moran (1966) emphasized individual differences in response sets. Hundal and Upmanyu (1974) and Kuntz (1974) operationalized associative difficulty by counting unique responses elicited by each stimulus word, defining a response as unique if produced by  $\leq 1\%$  of

## Response Entropy and Emotional Indicators in the Kent–Rosanoff Word Association Test: Implications for Psychological Assessment

participants. High associative difficulty implies a wide range of possible associations, serving as a precondition for high response entropy. While the constructs overlap, associative difficulty considers only the number of unique responses, whereas response entropy incorporates both total responses and their distribution.

In this context, Upmanyu (1981) examined the role of response entropy in emotional indicators elicited by the stimulus words of the Kent–Rosanoff Word Association Test. The study revealed that: (i) response entropy and unique responses are substantially overlapping constructs; (ii) long reaction time is positively and significantly related to response entropy. Singh (2017) further confirmed the significant relationships of response entropy with emotional indicators, unique responses, moderately infrequent responses, long reaction time, repetition of the stimulus before responding, misremembering, and forgetting, although response repetition did not reach statistical significance. These findings reinforce its value as an emotional indicator derived from Word Association Test may reflect pathological characteristics, and that creativity cannot be adequately understood without reference to its relationship with response entropy.

### **Limitations**

This brief note is limited by its reliance on previously published studies, many of which employed heterogeneous stimulus sets, scoring procedures, and clinical definitions that constrain direct comparisons. Much of the empirical literature reflects earlier diagnostic frameworks that may not align with contemporary classification systems. The present analysis is conceptual rather than predictive and does not propose the WAT as a stand-alone diagnostic instrument. Future research should employ standardized stimulus sets, clearly defined entropy metrics, and integration with modern assessment batteries to establish incremental validity in clinical practice.

## **CONCLUSION**

The diagnostic utility of the Word Association Test as an emotional indicator is best evaluated in relation to response entropy and associative difficulty. When these factors are systematically considered, the WAT demonstrates renewed relevance as a supplementary diagnostic tool. Researchers, clinicians, school psychologists, guidance counselors, and mental health professionals may employ the WAT cautiously and systematically in individual and group counseling contexts, enhancing interpretive validity while avoiding overgeneralized diagnostic claims.

## **REFERENCES**

- Andress, V. R., Frazini, L. R., and Linton, M. A. (1974). Comparison of homosexual and heterosexual responses to the Menninger word association test. *Journal of Clinical Psychology, 30*, 205–207.
- Appelbaum, S. A. (1960). Automatic and selective processes in the word associations of brain-damaged and normal subjects. *Journal of Personality, 28*, 64–72.
- Brown, W. P. (1965). Emotional indicators in word association. *British Journal of Psychology, 56*, 401–412.
- Cattell, J. McK., and Bryant, S. (1889). Mental association investigated by experiment. *Mind, 14*, 230–250.
- DeWolfe, A. S., and Youkilis, H. D. (1974). Stress and the word association process in reactive schizophrenics. *Journal of Clinical Psychology, 30*, 151–153.

**Response Entropy and Emotional Indicators in the Kent–Rosanoff Word Association Test:  
Implications for Psychological Assessment**

- Fuller, G. D., and Kates, S. L. (1969). Word association repertoires of schizophrenics and normals. *Journal of Consulting and Clinical Psychology*, 33, 497–500.
- Gough, H. C. (1976). Studying creativity by means of word association tests. *Journal of Applied Psychology*, 61, 348–353.
- Goldstein, M. J. (1961). The relationship between anxiety and oral word association performance. *Journal of Abnormal and Social Psychology*, 62, 468–471.
- Hull, C. L., and Lugoff, L. S. (1921). Complex signs in diagnostic free association. *Journal of Experimental Psychology*, 4, 111–136.
- Hundal, P. S., and Upmanyu, V. V. (1974). Emotional indicators in word association and their relation to psychometric measures of anxiety and neuroticism. *International Review of Applied Psychology*, 23, 111–120.
- Hundal, P. S., and Upmanyu, V. V. (1981). Nature of emotional indicators in the Kent–Rosanoff Word Association Test: An empirical elaboration. *Personality Study and Group Behavior*, 1, 50–61.
- Jung, C. G. (1910). The association method. *American Journal of Psychology*, 21, 219–269.
- Kent, G. H., and Rosanoff, A. (1910). A study of association in insanity. *American Journal of Insanity*, 67, 37–96, 317–390.
- Kraepelin, E. (1892). *Ueber die Beeinflussung einfacher psychischer Vorgänge durch einige Arzneimittel: Experimentelle Untersuchungen*. Gustav Fischer.
- Kuntz, D. (1974). Response faults on word association as a function of associative difficulty and affective connotation of words. *Journal of Consulting and Clinical Psychology*, 42, 231–235.
- Laffal, J. (1955). Response faults in word association as a function of response entropy. *Journal of Abnormal and Social Psychology*, 50, 265–270.
- Meyers, R., and Brecher, S. (1941). The so-called epileptic personality as investigated by the Kent–Rosanoff Test. *Journal of Abnormal and Social Psychology*, 36, 413–422.
- Miller, E. N., and Chapman, L. J. (1983). Continued word association in hypothetically psychosis-prone college students. *Journal of Abnormal Psychology*, 92(4), 468–478.
- Moran, L. J. (1966). Generality of word-association response sets. *Psychological Monographs*, 80(4, Whole No. 612).
- Penk, W. E. (1978). Effects of ambiguous and unambiguous stimulus word differences on popular responses of schizophrenics. *Journal of Clinical Psychology*, 34, 838–843.
- Rapaport, D., Gill, M., and Schafer, R. (1946). *Diagnostic psychological testing*. Year Book Publishers.
- Schwartz, S. (1978a). Language and cognition in schizophrenia: A review and synthesis. In S. Schwartz (Ed.), *Language and cognition in schizophrenia*. Erlbaum.
- Schwartz, S. (1978b). Do schizophrenics give rare word associations? *Schizophrenia Bulletin*, 4, 248–251.
- Singh, S. (2017). The diagnostic utility of the Kent–Rosanoff Word Association Test in relation to response entropy. *The International Journal of Indian Psychology*, 5(1), 121–140.
- Upmanyu, V. V. (1981). Study of the Kent–Rosanoff Word Association Test in relation to response entropy. *Personality Study and Group Behavior*, 1, 45–52.
- Upmanyu, V. V., Bhardwaj, S., and Singh, S. (1996). Word-association emotional indicators: Associations with anxiety, psychoticism, neuroticism, extraversion, and creativity. *Journal of Social Psychology*, 136(4), 521–529.
- Upmanyu, V. V., and Singh, S. (1984). Word association test responses: An index of pathological characteristics or creativity. *Personality Study and Group Behavior*, 4, 39–49.

## Response Entropy and Emotional Indicators in the Kent–Rosanoff Word Association Test: Implications for Psychological Assessment

### ***Acknowledgment***

The author gratefully acknowledges the inspiration, guidance, and enduring scholarly influence of his esteemed teachers, the late Professors Dr. P. S. Hundal and Dr. V. V. Upmanyu of Guru Nanak Dev University, Amritsar, and Panjab University Chandigarh, India. Their mentorship and contributions profoundly motivated and shaped the author's research work in this area.

### ***Conflict of Interest***

The author(s) declared no conflict of interest.

***How to cite this article:*** Singh, S. (2026). Response Entropy and Emotional Indicators in the Kent–Rosanoff Word Association Test: Implications for Psychological Assessment. *International Journal of Indian Psychology*, 14(1), 634-638. DIP:18.01.060.20261401, DOI:10.25215/1401.060