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#### **Authors**

Hahn, Lance W.  
Stockton, J. Dasha

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# Assessing Semantic Associates for a Single Word in a Single Individual

Lance W. Hahn (Lance.Hahn@WKU.Edu)

J. DaSha Stockton (Jerri.Stockton817@WKU.Edu)

Department of Psychology, Western Kentucky University, 1906 College Heights Blvd. #21030  
Bowling Green, KY 42101-1030 USA

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Individual differences are increasingly recognized as an important factor in the semantic processing of a word. Stolz, Besner and Carr (2005) describe both individual differences in priming and some limits of priming in specific experimental conditions. Plaut and Booth (2000) describe and model individual differences in perceptual ability that directly influence word recognition.

In order to evaluate individual differences in semantic processing, a standard is needed for assessing the semantic relatedness of two or more arbitrary words. Nelson, McEvoy and Schreiber (2004) provide a useful resource for assessing semantic associations based on free associations. However, free association provides a sparse sampling of a broad semantic space for a single individual. The focus of this paper is to assess semantic associations for a single individual in a restricted semantic space.

We created hub-spoke diagrams (see Figure 1) in which 12 spokes radiated from a central hub word. Each link had a single circle on which participants were asked to rate the association between the hub and the spoke word. Each diagram also had a table for up to four words that the participant could add as spokes.

## Method

### Participants

Undergraduate students (n = 65) participated in the experiment for course credit.

### Materials and Procedure

Following a brief written free association task conducted as part of another experiment, participants completed 11 hub-spoke diagrams in random order. Participants were instructed to rate the association between the hub and each spoke word on a scale of 0 to 20 with 0 indicating the two words were completely unrelated and 20 indicating the two words were very related. Participants were also instructed to begin by rating the most related word followed by the next most-related word and so on until the diagram was complete.

With one exception, the hub words were described by Nelson, Zhang and McKinney (2001) as high frequency words with low connectivity and either low or high resonance. Related associates were chosen based on

Nelson, et al. (2004) and at least two unrelated words were included in each diagram.

## Results and Discussion

To compare our results with Nelson, et al. (2004), we ranked each hub-spoke association within a hub by average rating and by an average of the forward and backward free association weights. For each hub, a Spearman rank-order correlation between the two rankings was calculated. The correlations were at least moderately significant ( $r_s = .60$ ,  $p < .05$ ) and were typically significant ( $p < .01$ ). The low resonance hub correlations were all lower ( $r_s < .75$ ) than those for the high resonance hub correlations ( $r_s > .8$ ).

Hub-spoke figures capture many semantic associations in a restricted semantic space for a single individual. The associations are highly correlated to those captured by free association, but, by nature, do not capture the directionality of free associations. The reduced, but significant, low resonance correlations suggest that this rating system may not simply be a linear combination of the forward and backward weights produced by free association measures.

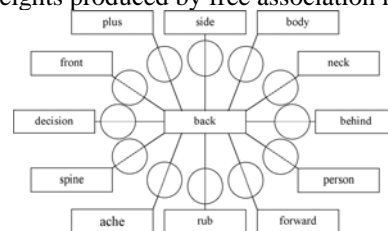


Figure 1: A sample Hub-Spoke diagram.

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