

Aiming for more objectivity in creativity assessment – Applying word vectors on creativity data

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Introduction: Divergent thinking (DT), as a compound of creativity, refers to an ability to produce multiple ideas to a given topic or various solutions to a given problem. A possible means to measure DT is the Associative Fluency Task (AFT) where participants are instructed to tell everything that comes to their minds once presented with a prompt word. The output of such DT tasks is typically assessed by the number of produced ideas (i.e., fluency), their originality as well as their semantic proximity (i.e., flexibility). Whereas there are objective means to assess fluency and originality, flexibility is often subjectively rated, which is not only costly and labor intensive, but also influenced by inter-individual variations in the perception of semantic distances.

Aim: Therefore, the development of an objective, quantitative and sensitive measure of semantic distances and consequently of the flexibility of given answers is the aim of this project.

Methods: The semantic distances between words were quantified by applying word vectors of the German language that were trained on a large text corpus. The word vectors were adapted for the purpose of creativity assessment by building a more diverse text corpus for the training and by taking homonyms, synonyms, and compound words into account to circumvent context ambiguities.

Discussion/Outlook: The generated word vectors were applied on data from the AFT of 50 healthy subjects and flexibility was determined which shall be compared to human ratings and ratings extracted from GermaNet, a semantic network for the German language. First preliminary results indicate that the flexibility performances as assessed by the word vectors is more sensitive and not confounded by the frequency of given answers. Overall, the developed measure has a great potential to objectively assess the output of DT tasks.