**New quantitative methods for investigating perception, emotion, and embodiment in literary language**

How does modernist German literature explore the relation between embodiment and sense modalities such as vision? And can this be empirically explored in ways that complement interpretive methods with experimental ones? In 2008-9, ET conducted an experiment that evaluated cognitive responses to variants of Kafka manuscript (Troscianko, 2013; Troscianko, 2014, pp. 217-19); now, re-analysis of participant responses using new data from psycholinguistics discloses several intriguing relationships. These include a potential direct correlation between an individual's propensity to generate mental imagery and their liking of less 'Kafkaesque' language (Fig. 1), and an inverse correlation between the use of embodied language and visual language (Fig. 2). Further exploration of these ideas would provide an excellent focus for a Masters project or part of a PhD/DPhil project—ideally for someone with a background in literary studies and a willingness to engage with computational methods and basic statistics. This would be timely for four reasons:

1.  The method makes use of extensive, robust word norm data. These are large-scale corpora of words that have been evaluated for their cognitive impact. In particular, it uses data on words and interoception (i.e. embodiedness) that has only recently been published (Connell, Lynott, & Banks, 2018) and is entirely untapped for literary inquiry. This promises to significantly enhance the available strategies for analysis of complex verbal material. Note also that word norm corpora are constantly growing, and currently missing norms (e.g. the emotional dimension of *dominance* [the feeling of being in control], in German) may soon become available. This approach may be fruitfully combined with a variant on the inductive categorisation-based analysis conducted in the original iteration of the experiment, to make progress with the perennial problem of how to dovetail 'quantitative' and 'qualitative' methods in meaningful ways to attain the maximum possible benefits of both.

2.  The method employs a control/active condition logic – using the author's own manuscript changes – that resists some of the common criticisms made of empirical investigations of literary features: that the hypotheses being tested are trivial, that the manipulations made are ecologically invalid, or that the findings tell us nothing we didn't already know about 'real literature'. In this case, the author was trying to achieve effects by making changes as he wrote, and these intended changes ought to be visible in the resulting text and/or in people's responses to it. The rationale is simple and cogent, and intrinsically suited to experimental testing.

3.  The design of the original hypotheses and this means of testing them arose out of a combined analysis of ordinary English usage (what has the term 'Kafkaesque' come to mean unmoored from its narrow reader-response origins?) and of the critical literature on Kafka (how has the term and concept been parsed by critics since his very first published readers?). Both are conducive to empirical exploration in ways that complement the word-norms approach, for example using the new 'citation analysis' method (Bruhn, 2018) that maps the relative frequencies of critically cited passages for specific authors, genres, or periods. Characterisations of authorial styles and effects, or indeed the styles and effects of genres, are easy to sweepingly generalise about, but they are also increasingly possible to sensitively investigate.

4.  The inclusion of measures of individual variation (imaging and emotional tendency) alongside measures of textual and response variance contributes to a trend away from treating 'the reader' as a generalised aggregate, asking how 'trait' and 'state' attributes in individual readers interact with the static features of the literary text to change the dynamics of textual encounters (e.g. Carney & Robertson, 2018). This

line of inquiry opens out into the broad territories of how readerly preference, motivation, and reward are affected by human cognitive diversity.

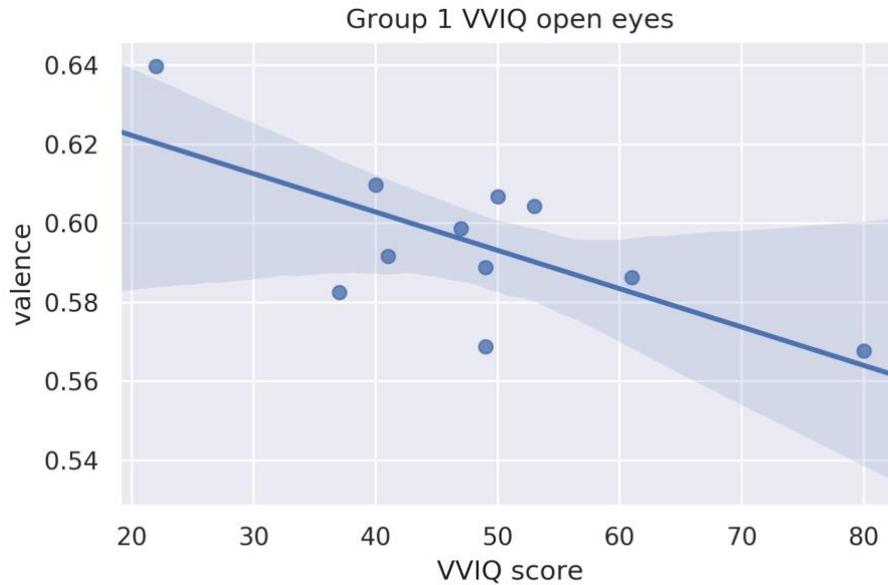Illustrative examples from the recent re-analysis using word norms:



Figure 1: The relationship between readers' mental imagery tendency as measured by the Vividness of Visual Imagery Questionnaire [x] and the emotional dimension of valence (positive–negative) and in their think-aloud responses [y] during reading of Kafka's short story 'Schakale und Araber', in a version with none of Kafka's manuscript changes incorporated. Increasing VVIQ score indicates decreasing mental imagery tendency.
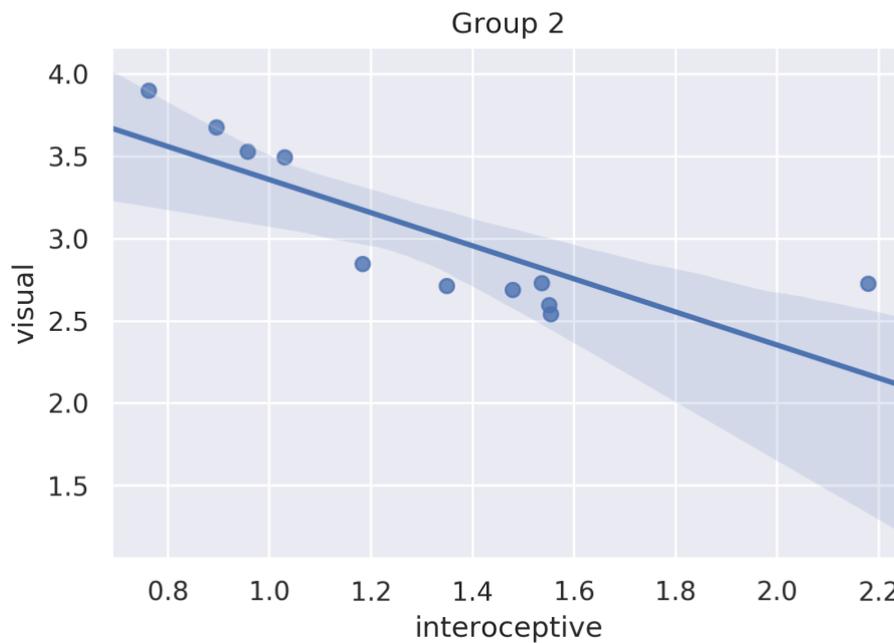


Figure 2: The relationship between the interoceptive [x] and visual [y] qualities of language in the think-aloud response transcripts of readers of Kafka's short story 'Schakale und Araber', in a version with the visuospatial subset of Kafka's manuscript changes incorporated.

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