

Do individual differences in fiction reading predict emotion recognition?

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Individual differences in (mostly) fiction reading have been associated with variation in cognitive-linguistic knowledge and skills, including vocabulary [1], syntactic structures [2], and school achievement [3]. A very different literature has explored whether fiction reading is linked to emotion recognition in facial expressions, empathy, and other nonlinguistic Theory of Mind tasks. In numerous Mechanical Turk studies, rates of fiction exposure (scores on the Author Recognition Test, ART [4]) predict emotion recognition scores [e.g. 5,6]. If true, this result may suggest “far transfer” from one form of learning to another, in that individual differences in a largely non-social event (reading) positively correlate with social skills (emotion recognition).

Several concerns remain, however. First, attempts to find a causal link via manipulations of brief fiction exposure find no consequences for emotion recognition [e.g. 6]. Long-term reading may nonetheless be an important factor where short-term experience fails. Second, the ART-emotion studies have an age confound, where older participants have both more exposure to fiction and more practice in emotion recognition, meaning that any causal relationship between reading and emotion recognition could be spurious. Establishing a true effect of fiction reading requires control of this confound. To investigate how fiction may improve emotion recognition and address conflicts in the literature, we **a**) conducted large-scale corpus analyses on how fiction, nonfiction, and spoken language convey emotion information, and **b**) examined the fiction reading-emotion link in an undergraduate sample with low age and education variability.

Does emotion language differ by corpus genre? Emotion researchers distinguish simple emotions (e.g. joy, sadness) from complex emotions, which are thought to be mixed simple emotions (e.g., amusement, relief) [7]. We extracted the lemmas and surrounding sentence context of the 6 simple and 8 complex emotions identified by the Geneva Emotion Recognition Test (GERT) from the 600+ million-word COCA corpus [8]. The corpus was partitioned into fiction, spoken, and other (news, etc.) genres. Tokens were hand-coded as either emotive (e.g. *a sob of relief*) or not emotive (e.g. *hurricane relief efforts*) (inter-rater agreement .95 on subset). Rates of emotion word occurrences were comparable across genres, but emotive usage rates differed by emotion type and genre: Simple emotion words were used emotively in all genres, but complex emotion words were more frequently used in emotive senses in fiction than in the other two genres (**Fig 1**). These results indicate that written fiction provides rich information about complex emotions, which is less available in other genres.

Does fiction experience predict emotion recognition? College-aged native speakers of English ($n=134$) completed the Geneva Emotion Recognition Test (GERT)[9] and the Author Recognition Test (ART). The GERT contains 42 short videos of actors expressing 6 simple and 8 complex emotions; participants identify one of the 14 emotions for each clip. While mixed effects regression of ART score did not predict average emotion recognition, $b=.09$, $X^2(1)=1.53$, $p=.13$, there was a reliable interaction between ART score and emotion type (simple/complex) in predicting correct recognition, $b=.18$, $X^2(1)=2.06$, $p=.04$. ART was a stronger predictor of complex emotions ($b = .19$) than simple emotions ($b = .00$) (**Fig 2**). These results implicate long-term fiction reading experience in complex emotion recognition.

Together, these results suggest that long-term language exposure, and fiction exposure in particular, correlates with readers’ skill in identifying complex human emotions in videos. Corpus analyses lend a potential causal account to the ART prediction of GERT scores: specific language experience matters for behavior in domains outside of language use. Complex emotion comprehension is difficult [10], and fiction eases comprehension through category label exposure, elaboration, and examples in fiction. These results could advance reading interventions to develop theory of mind in at-risk populations. We will discuss ongoing work on how individual language experience may load onto semantic embeddings of emotion words, and how to manipulate long-term language exposure to modulate readers’ theory of mind.

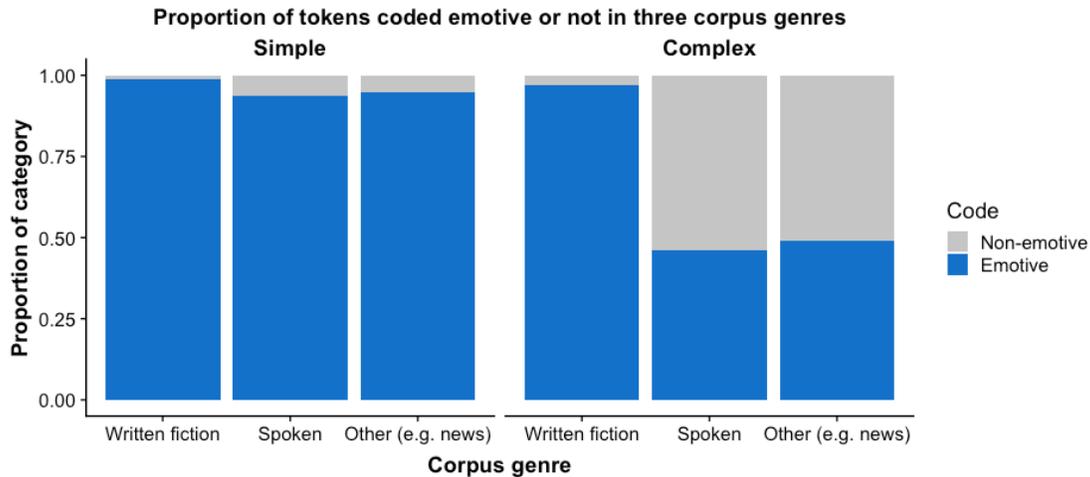


Figure 1. Corpus analysis results. Taller blue bars indicate more use of emotive sense of words in a given genre. While simple emotions are almost always used in emotive senses in all corpus genres (left graph), complex emotion words (shown right) have a high occurrence of emotive uses in fiction but are mostly used in non-emotive senses in speech and non-fiction genres.

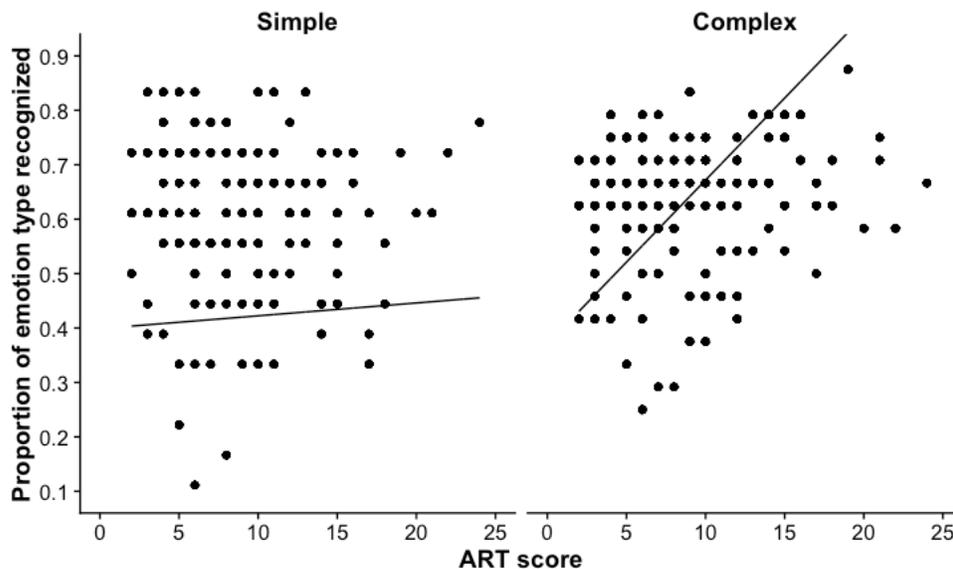


Figure 2. Model predictions regressing emotion recognition on ART score; raw data plotted in background. ART score better predictor of complex emotion recognition than simple emotion recognition.

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