

Introduction

Over the last decade, psychologists have proposed that fiction promotes empathy and theory of mind in its readers. The nature of fiction is theorized to “simulate” these domains in the minds of those engaged in fiction literature. As storylines become more detailed and characters develop, the reader understands the emotions and mindsets described in the literature because they are feeling them as their own (de Vignemont & Singer, 2006). *Simulation* is theorized to be one route to development in empathy and theory of mind (Mar et al. 2006), and an appropriate conceptualization of reading fiction. However, the claims of Mar and colleagues has not been entirely reproduced in recent replication studies. Bal and Veltkamp (2013) offered that in order for changes in empathy to take place, an incubation period must take place first. In other words, effects of simulation would not be as common directly following a narrative reading experience, as it would after time has passed in which the reader has been reliving and thinking more deeply about what they have read over time. For instance, engaging with unrelated tasks may improve one’s problem solving ability (cite). Incubation in the context of reading implies that one will apply what they have connected with in literature to the real-world surrounding them, but this process takes considerable amounts of time. Bal and Veltkamp (2013) assessed increases in empathy in participants immediately following a fiction or non-fiction reading condition, and then one week later. Evidence of a sleeper effect, in which people scored higher on empathy scales one week later than immediately after reading a narrative, was found. We note that if effects can be seen this early after reading fiction, indeed it is possible to find more noticeable effects over longer periods of time. In our study, we sought to examine this claim using longitudinal data most appropriate for exploring the connection of reading with the development of empathy.

Transportation and Narrative Mode

Gerrig (1993) highlighted the pervasiveness of entering a “narrative world,” or storyline of a fictional text. He explains a process called *transportation*, in which narrative receivers travel into the world of a fiction novel (commonly referred to as “losing oneself in the book”). Readers may become absorbed into the story, in which they move farther away from their own reality, according to Gerrig. Through this, (cite) readers are able to change as a function of connecting with characters and the events that take place in the novel’s “world.” Bruner (1986) provided that in order for fiction reading to elicit fluctuations in personality (e.g. empathy), the reader must be transported into a narrative. The process of transportation is unlikely to happen in a nonnarrative or nonfiction work, as these typically lack protagonists, settings, and emotional events. Yet, some non-fiction novels do include these features deemed necessary by Gerrig to evoke transportation, and thus need to be distinguished when analyzing effects of certain types of literature on empathic development.

Theory of Mind and Agreeableness

Theory of mind (ToM) refers to “the cognitive capacity to attribute mental states to self and others,” and furthermore, one’s cognitive capacity to understand perceptions, beliefs, desires, hopes, and intentions of another (Goldman 2012). The concept behind this coined phrase is quite literal, to say that engaging in theory-of-mind is depicted by a person accurately theorizing about what is taking place in the mind of another person (e.g. mentalizing, mindreading). Nettle and Liddle (2008), further break down ToM into two subcomponents: *social-perceptual* and *social-cognitive* ToM. They explain that social-perceptual ToM would be best measured by the Mind in the Eyes Test (Baron-Cohen, Wheelwright, Hill, Raste, & Plumb, 2001), in which a participant must identify the correct mindset being expressed through referencing photos of people’s eye regions. Social-perceptual ToM more specifically focuses on one’s ability to judge the mental states of others based off of facial expressions or other available bodily indicators. Social-cognitive ToM speaks to the “ability to reason about the content of another’s mental state and use that reasoning to predict or explain their actions,” (Nettle & Liddle 2008). Tasks central to this aspect of ToM can involve participants being presented with narratives and then being asked to draw conclusions about the beliefs of the character(s). We predict that this ToM domain would more closely resemble what is referenced in past literature regarding fiction eliciting ToM in narrative receivers. Nettle and Liddle’s study suspected a positive association between social-cognitive ToM and the Big Five personality dimension of *agreeableness*. The agreeableness dimension of personality is widely theorized to be associated with affective and cognitive empathy (Melchers, Li, Haas 2016), and thus is important to note. Needs more**

Past Research:

Past research has provided abstract evidence to support the promotion of empathy and theory of mind through reading. Furthermore, empathy and theory of mind have not been studied longitudinally, which would be essential in order to examine potential increases over considerable periods of time.

Our study:

We hypothesized that readers of fiction would increasingly use empathic words as they read more fiction books over time. To measure this predicted increase, we drew thousands of book reviews from Goodreads.com, where readers review books they’ve read. We used reviews from 100,000 reviewers (from 20,000,000 users). Our study sought an answer to the question: Does reading fiction increase empathy? We aimed to study empathic language used in a huge number of book reviewers over substantial amounts of time and discuss now how this method streamlines evidence in support of our hypothesis.

Empathy dictionary:

- Haidt & Graham (2013) moral dictionary for *harm and care* moral foundation
 - According to authors, this characterizes empathy aspect of moral foundations

- Saucier (1997) used lists of adjectives corresponding to each dimension on the Big Five to measure how much of each trait participants described themselves to have / were described by others to have
 - Words from the *agreeableness* dimension of this study are used
 - *Agreeableness* is theorized to be highly associated with empathy (Mooradian, Davis, Matzler 2011) (Melchers, Li, & Haas 2016)
- We added more words through referencing empathy surveys and through using a thesaurus to gather as many like words to empathy as possible
 - Toronto Scale of Empathy and Empathy Quotient

Python, Stata, and Results

We requested permission from Goodreads.com and extracted reviews from its members using *Python* (a sophisticated programming language and software). Next the data were uploaded into *Stata*. We counted the number of words from our comprehensive empathy dictionary that appeared in each review, and then divided this sum by the total number of words in the review. Goodreads.com does not require reviewers to leave a discussion as a part of their review and may just leave a 1-5 star ranking instead. These “missing” review values were discarded, and so were reviews written in languages other than English. After accounting for these exclusionary criterion, 74,200 reviews remained and were examined. **Need a graph, add actual results. Can we compare the agreeableness words separately too as exploratory investigation?**

Discussion

Our central finding is that the proportion of words in reviews that appear in the empathy dictionary increase as a function of the number of reviews written. This finding suggests that reading fiction makes people more empathic, and supports Bal and Veltkamp’s notion that reading fiction is associated with change in empathy. And, that an incubation period yields more frequent instances of empathic language use in avid book readers and reviewers. Of course, our findings are correlational, and do not demonstrate causality. More research is definitely needed to identify causal relations.

When readers are deeply absorbed in a novel they are reading, they may feel as though they are being *transported* into the realm or story being told. Some readers describe this feeling as “getting lost” in the book or say things like “I could not put this book down!” Gerrig theorizes that this phenomenon, coined *transportation*, occurs when people are reading narratives (1993). Beforehand in 1986, Bruner offered that in order for the effects of fiction on empathy to take place, one must be reading a narrative. He highlighted that a proper narrative includes relatable characters and believable settings and situations, as opposed to non-fiction novels lacking those aforementioned characteristics. Thus, as reviewers from our sample used language indicative of empathy at increasing rates, and as a function of reading more narratives, it is very possible that these readers were being transported into the novels. But, our study does not provide evidence for this and can only speculate the causal mechanisms behind the association that we did find.

Because our empathy dictionary included language expressive of agreeableness as it relates to empathic tendencies, it is also

Future Directions

- Transportation was not measured in this study, and its relationship to empathic development through fiction reading should be considered in future research.
- Personality should also be measured.
- Big data is very exciting, but it is unfortunate that we are unable to collect more personality and empathy data on these reviewer's (e.g. administering empathy surveys and Big Five self-report assessment)
- On the other hand, we get more objective evidence and do not have to account for high demand characteristics, which are more prevalent when self-report tools are being used. People leaving reviews online are not under the impression that they are being scored or studied and are more likely to behave genuinely [or true to themselves] than if they were aware that their reviews were being studied.