

### *Introduction*

Over the last decade, psychologists have suggested that fiction promotes empathy and theory of mind in its readers. The nature of fiction is theorized to “simulate” these domains within the reader’s thoughts and feelings. 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* has been presented as 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 have not been entirely reproduced in recent replication studies. As the following sections will discuss, it is necessary to study the proposed phenomenon over longer periods of time and in larger groups of people.

### *Defining Empathy, Theory of Mind, and Fiction*

In order to study the effects of reading fiction on developing empathy and theory of mind, these terms must first be defined. “Empathy” in psychology can be broadly defined as “one person’s response to his or her perceptions of another person’s current experience” (Hodges & Myers 2007). This concept speaks to a person’s emotional and cognitive understanding of the thoughts and feelings of others. Thus, empathy can be further broken down into emotional empathy (feeling *with* another) and cognitive empathy (perspective taking). In this article, we adopt an overarching acceptance of the term *empathy*, which includes both emotional and cognitive forms. **But, we measure each form of empathy separately and combined?** When measuring empathy through text analysis, some words expressing cognitive empathy are “think” or “imagine,” whereas “feel” or “compassion” are considered to express emotional empathy.

Theory of mind is a term interchangeable with cognitive empathy, or mentalizing. These concepts go hand in hand. For purposes of this article, theory of mind is defined as, “the cognitive capacity to attribute mental states to self and others” (Goldman 2012). When taking on the perspective of another, a person is envisioning what they believe another person or character is thinking.

Past research has distinguished between fiction and non-fiction writing, to say that the narrative structure of a work determines its potential to influence a reader (Bruner 1986). Bruner further argues a “logico-scientific” mode of thinking that is cultivated when people read nonfiction works such as newspapers or scientific publications. This type of reading is not capable of eliciting empathy. He argues on the other hand, the narrative mode of thinking, which is best represented through fictional literature. How well a novel establishes a world that is realistic and relatable to the reader is crucial to the narrative mode of thinking, in such that readers will identify with the storyline and characters. Thus, fiction in this study includes all fiction novels reviewed from our random sample, and empathic development will only be examined in these data.

### *Sleeper Effects in Fiction Reading*

Bal and Veltkamp (2013) offered that in order for changes in empathy to take place, an incubation period must happen 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. During this elapsed time the reader will have been reliving and thinking more deeply about what they have read over time. These authors suggest that people's ability to understand others will improve as a function of practicing the skill, when reading narratives and adopting the mental states of a narrator. Further, when people are deeply absorbed into a novel, they are more likely they to remember it and therefore increase their empathic tendencies in the real world. This concept is also known in psychology as a *sleeper effect*, in which the effects of a manipulation do not reveal themselves immediately, but rather develop (present?) over 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 between reading and the development of empathy.

### *Neurological Evidence*

In 1980 (check year), Giacomo Rizzolatti discovered that when monkeys watched other monkeys and humans do things like reach for food, neurons would fire in the brains as if they were experiencing the event themselves. When neurons fired in the brains of the watcher, they were said to be "mirroring" the perceived behaviors. Thus, *mirror neurons* are widely accepted as those that respond to observing the actions of another. Recent neuroimaging studies have examined mirror neurons in the context of empathy (cite). For example, (CITE) participants watched emotional films and showed activation in brain regions as if they were experiencing the events occurring in the film. The mirror systems within our brains go along with Goldman's proposal of simulation theory mentioned earlier (2000), to say that people simulate perceived mental and emotional states when reading. In relation to this study, mirroring brain systems within the context of reading could provide additional support to our hypothesis. When reading fiction literature, it is highly possible that reader's affective brain regions are firing and mirroring the cognitions that are being perceived to take place within the characters of novels, according to mirror systems theories.

### *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, 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 to evoke deep absorption, and thus need to be distinguished when analyzing effects of certain types of literature on empathic development.

### *Theory of Mind and Agreeableness*

As mentioned earlier, 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 when a person is accurately theorizing about what is taking place in the mind of another person (e.g. mentalizing, mindreading). Nettle and Liddle (2008), further dissect ToM into two subcomponents: *social-perceptual* and *social-cognitive* ToM. They argue 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). Social-cognitive ToM would more closely resemble what past research references when arguing that reading fiction facilitates growth in ToM (Kidd&Castano 2013). 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 suggested to be associated with affective and cognitive empathy (Mooradian, Davis & Matzler 2011)(Melchers, Li, Haas 2016), and thus is important to note.

### *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. Another advantage our methods provide for studying empathic development is a large sample size. A random sample of tens of thousands of reviews across 100,000 participants would, in theory, allow us to better analyze any change in empathy.

### *Our study*

We hypothesized that fiction readers would increasingly use empathic words as they read more fiction books over time. To measure this predicted increase, we drew a random sample of over 74,000 book reviews from Goodreads.com, where readers review books they've read. We randomly sampled reviews from 100,000 reviewers, from over 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. We strive to provide objective evidence in support of the predicted phenomenon.

### *Empathy dictionary*

We created an empathy dictionary made of words that have been found to be expressive of empathy. For instance, Haidt and Graham (2013) devised a moral dictionary corresponding to their proposed seven moral foundations. One foundation, *harm and care* characterize empathy and nurturance, according to the authors. Thus, words from this dictionary were incorporated into the empathy dictionary for this study. We also drew from Saucier's 1997 research in which he identified familiar English adjectives that described people and used them to measure the different Big Five personality structures. The words he found to describe the trait of *agreeableness* were adopted in this study, as this dimension is theorized to be associated with affective and cognitive 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. The Toronto Scale of Empathy and the Empathy Quotient are two examples of empathy surveys that we drew empathy-like words from. However, it is important to note that, although these words are likely to express empathy, not all people expressing empathy may necessarily be limited to these words.

### *Procedure and Exclusionary Criteria*

We requested permission from Goodreads.com and extracted reviews from its members using *Python*. Next the data were uploaded into *R*. 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. This provided us with a proportion or percentage of empathic words per individual book review and allowed us to see any change in empathic language use over time. Again, we tested reviews for words from an overarching empathy dictionary, and for words expressing only cognitive and only emotional empathy derived from this main dictionary. 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. We then investigated whether the proportion of empathic language people wrote increased as they wrote more reviews.

## *Results*

The number of reviews written by people and their empathic language use indicated a significant relationship ( $p < .01$ ). Through graphic visualization, we found a slight, but significant increase in emotional empathic language and total empathic language as a function of writing more reviews. Cognitive empathic language use in reviews alone slightly decreased.

## *Limitations*

A few limitations are worth noting. More statistical testing is needed to demonstrate if it is necessary for people to write about the books they've read, in order to reap the proposed benefits of reading fiction. More specifically, it is possible that mere elapsed time from reading fiction is the key component to fluctuations in empathy. In the data, there were cases in which writers were reviewing multiple books on the same days. We speculate that they were reading more books over time but writing about them all on one day. This factor fogs the lens through which we view the phenomenon of interest because it becomes difficult to gage the impact of writing reviews over time. Another important question to ask is, how many books must someone read in order to increase empathy? Some users have written just one or two reviews, and some have written hundreds of them. This wide range of reviews makes identifying how effective reading fiction is on empathic development difficult. In other words, although the results show a significant relationship, the effect size is smaller.

As mentioned earlier, we are only able to account for the words programmed into our empathy dictionary. There is definitely room for members to have expressed empathy through the use of language not examined here. And, it is possible that people using the words from our comprehensive dictionary are not truly representative of empathic intentions. However, the dictionary is as representative of empathy as possible according to the resources available in past research.

Working with such a large set of archival data does not allow for us to survey participants any further. Thus, it is not possible to gather further helpful information such as the context of their reviews, or self-report measures concerning empathy and personality.

## *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 have limitations, and future research is definitely needed to identify causal relations with large effect sizes.

Studying reviews from *Goodreads* provided more objective evidence than past research. Previous studies have used self-report surveys to measure empathy, and participants were aware of their roles in the study. We did not have to account for high demand characteristics, which are more prevalent when self-report tools are being used. Thus, people leaving reviews online are not under the impression that they are being scored or studied and are more likely to behave genuinely than if they were aware that their reviews were being studied.

### Future Directions

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, one could suppose that these readers were being transported into the novels. But, our study does not provide evidence for this and can only speculate any mediating mechanisms behind the relationship that we did find.

Working with large datasets, commonly referred to as “big data,” is exciting, but unfortunately in this case we were unable to collect additional data. Future research would benefit from administering empathy surveys and Big Five self-report assessments in order to get a better idea of the kinds of people reading and reviewing fiction.

