

IT'S NOT WHAT YOU SAY, IT'S HOW YOU SAY IT: A LINGUISTIC ANALYSIS  
OF EMPATHY IN FICTION READERS

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## THESIS ABSTRACT

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Empathy is crucial for understanding human social relationships. Research examining the factors that influence empathy can provide valuable insight into the ways in which empathy can be deepened. Some researchers have hypothesized that fiction exposure is one route to improving empathy and theory of mind. This study assessed linguistic markers linked to empathy in a large group of avid fiction readers who have submitted book reviews on the online social media site Goodreads.com. My goal was to investigate a relation between fiction exposure and increases in empathy. Previous research has demonstrated that the use of third person pronouns (e.g. “he” and “she”) in Facebook posts is negatively correlated with empathy scores on the Interpersonal Reactivity Index (Davis, 1983), (Otterbacher et al. 2017). The use of other linguistic markers, punctuation and writing in the present-tense, in Facebook posts were positively correlated with empathy. In this study, I used the frequency of these three linguistic markers in book reviews to assess empathy. I made use of a longitudinal data set in which people write reviews of numerous books over time. I allowed an assessment of changes in words associated with empathy as a function of books reviewed. This study features a large sample size (e.g. 100,000 book reviewers) and change measured over years. Findings indicate correlations between the number of reviews a person has written and the

percentage of each review that reflects words associated with empathy. Participants were more likely to use the punctuation category, which is associated with greater empathy, in their reviews as a function of reading more books. Other word categories like the “he/she” pronoun and present tense verbiage were not found to be used more or less often as fiction exposure progressed.

*Keywords:* empathy, fiction, linguistic analysis

## **It's not what you say, it's how you say it: A linguistic analysis of empathy in fiction readers**

“Learning to stand in somebody else's shoes, to see through their eyes, that's how peace begins. And it's up to you to make that happen.” -- Barack Obama 2009

Former president Barack Obama spoke these words at a meeting with college students in Turkey, with the intentions of establishing a better relationship between the United States and the Muslim world. This idea refers to the pivotal role empathy plays in understanding and maintaining healthy human social relationships. Understanding the thoughts and feelings of others may allow us to consider our own actions with deeper meaning and inspire us to be better citizens.

### ***Defining Empathy***

The term “empathy” was introduced to the English language over a century ago by the psychologist, Edward Titchener. The term originates in the German word “Einfühlung” or “feeling into” (Stueber, 2018). More broadly, empathy can refer to “the reactions of one individual to the observed experiences of another,” (Davis, 1983). Social cognitive neuroscientists Jean Decety and Yoshiya Moriguchi (2007) defined empathy as the interaction between four physically observable neural networks that are responsible for affective sharing, self-awareness, mental flexibility, and emotion regulation (Gerdes, Segal, & Lietz, 2010). Psychotherapist Carl Rogers, defined empathy as an essential component to therapy, “To sense the client’s private world as if it were your own, but without ever losing the ‘as-if’ quality (1957, p. 99).”

Empathy is typically characterized as having both cognitive and emotional elements (Davis, 1983; Gerdes et al., 2010). Cognitive empathy can be thought of as the ability to infer the perspectives of others, which is generally similar to *theory of mind*.

Premack and Woodruff explain that humans can ascribe mental states to themselves and others and understand the intentions of others as separate from their own (1978). For instance, a customer service representative might understand that a customer is angry about a store policy, rather than with them personally. The service representative understands what the customer is thinking, or is able to “tune-in” to the other’s mind. Other research focuses on the emotional component of empathy, in which people feel emotions similar to those that they perceive in another individual (de Vignemont & Singer, 2006). Researchers de Vignemont and Singer suggest that individuals may share affect with others when observing their emotions. The same affective neural networks that become activated when people experience their own emotions also become active when people observe others feeling those same emotions (2006). For example, witnessing another person crying may elicit feelings of sadness in the observer, or even cause the observer to cry too. Emotional empathy requires an individual to feel what they perceive another person to be feeling, which is not required of cognitive empathy or perspective-taking. In other words, a person need not take on the emotions of another in order to understand their mental state.

In addition to the distinction between cognitive and emotional empathy, it is also important to discriminate between state and trait empathy. When one reacts to the experiences of another, either through perspective-taking or feeling similar emotions to those perceived in another, they are in an empathic state. State empathy is a temporary condition, being that one would not constantly maintain these thoughts or feelings. Alternatively, trait or “dispositional empathy” has been viewed as a multifaceted personality variable that differs among individuals (Davis, 1980; Moordian, Davis &

Matlzer 2011). Further, researchers posit that individuals may be inherently empathic, rather than experiencing empathy in a situational context (Davis, 1980). Davis considered empathy as a set of discrete constructs that must relate to “responsivity to others.”

### ***Reading fiction and empathy***

Fiction may provoke development in readers’ thoughts, feelings, and understanding of the social world. Psychologist Richard Gerrig (1993) described reading fiction as a performance, in which readers take on the perspective (e.g. beliefs, values, affect) of characters from a novel as would an actor playing a role. In this sense, the experience of reading fiction requires one to actively identify with the actions and values of book characters, while still preserving their own beliefs. Through this, readers may better their understanding of themselves and others around them in their own world. Experiencing fiction as previously described is postulated to contribute to empathic development.

Past research has examined the correlation between fiction exposure and measures of empathy (Mar et. al 2006). In one study, participants completed the Author Recognition Test (ART), in which they identified well-known authors of fiction and nonfiction. This provided an indirect index of the extent to which they read either genre. Participants then completed an assessment of empathy in which they identified the mental states of individuals in still pictures, known as Mind in the Eyes Test (MET). A positive correlation was found between knowledge of fiction authors and empathy. This finding was later replicated by Mar, Oatley, and Peterson (2009), in which fiction scores from the ART were positively correlated with identifying others’ perspectives. Mar and colleagues also measured personality traits to investigate whether this factor could have explained

the association between fiction and empathy. Even after statistically adjusting for personality, the relationship between reading fiction and the empathic development remained. Another study examining the potential for literature exposure to improve empathy also replicated Mar and colleagues' findings (Djikic, Oatley, & Moldoveanu, 2013). One hundred participants completed a package of questionnaires that measured lifelong exposure to fiction and non-fiction (ART), personality traits, and empathy. After reading either a short essay or a short story equivalent in length and complexity, the package of questionnaires was completed once more along with a non-self-report measure of empathy. Djikic and colleagues found that greater lifelong reading of fiction was positively associated with the ability to infer the emotions of others, regardless of the condition they were assigned to.

A series of experimental studies by Kidd and Castano support the notion that reading fiction enhances theory of mind skills (2013). Participants in the study showed improved theory of mind abilities upon reading short fictional texts. These findings were moderated by the type of fiction participants were exposed to. Literary fiction, rather than popular fiction, was the only type of literature found to improve theory of mind skills. Kidd and Castano offer that literary fiction "may hone in on adults' theory of mind, a complex and critical social capacity" (p. 380, 2013).

In an attempted replication study of these experiments, the authors proposed that the original researchers neglected to account for random effects due to variation in the texts used in the experiments when conducting their statistical analyses, therefore increasing the chances of obtaining a false positive result (Panero et al., 2016). To correct this, Panero and colleagues used a multilevel model to analyze the data they collected

using the same procedures as the original study, except with a larger sample. They found no support for the notion that short-term exposure to any type of fiction improves theory of mind. Interestingly, the results found a positive correlation between familiarity with fiction according to ART scores, and theory of mind, replicating past findings (Kidd & Castano, 2013; Mar & Oatley, 2008). The authors explain that reading fiction may have a gradual, rather than an immediate, effect on theory of mind (Panero et al., 2016). In 2018, a similar replication of four out of the five experimental studies by Kidd and Castano was conducted by Samur et al., who suggested that stronger statistical evidence was needed to support the robustness of the original experiments. The same literary texts, theory of mind tasks, and recruitment methods were used in these replication studies, except each group had larger sample sizes. The results found a positive correlation between familiarity with fiction and theory of mind, confirming the results of Panero and colleagues. Alternatively, the results were unable to confirm that any type of fiction (e.g. literary, popular) helped theory of mind skills (Samur et al., 2018). In summary, it has been proposed by some that fiction exposure improves theory of mind abilities immediately, while others were unable to replicate the results that support this notion, and instead posit a gradual effect.

Notably, the relationship between fiction and empathy has typically been examined across short periods of time. Participants' empathic growth has generally been gauged directly after fiction exposure. Other research has suggested that greater amounts of time must pass in order to observe larger effects of fiction (Bal & Veltkamp 2013; Panero et al., 2016). In order to test this, participants' empathy was assessed directly after reading a fictional story and one week later, in a study done by Bal and Veltkamp (2013).



Those who were assessed one week later tended to show enhanced levels of empathy compared to tests that took place immediately after. These authors conclude that the effects of fiction exposure “do not present themselves immediately, but that the effects are guided by an absolute sleeper effect (p. 9, 2013).” In other words, the process of connecting with fiction and changing as a result should not happen immediately, but rather gradually.

Djikic and Oatley suggest three aspects of literature that promote empathy: simulation of other selves and other minds, changes in personality, and indirect communication. These authors explain the experience of reading fiction as being interchangeable with “simulation of selves with others in the social world (2014).” This occurs when readers identify with characters in a novel and become more connected with themselves through reading. Djikic and Oatley (2014) argue that fiction indirectly produces “fluctuations,” or changes in personality, like empathic ability. This can happen when readers are emotionally involved with a novel, and take on the experiences of a story, which can lead to changes in the self. Third, when readers engage with a novel, these authors suggest that an indirect communication between the reader and the main character takes place. One might feel sympathy or disappointment about a plight of the main character, and experience emotions and opinions in their own mind. Djikic and Oatley describe this third aspect as being a “nondirective social influence (p. 503, 2014).” In summary, Djikic and Oatley assert that fiction (and other works of art) possess a nondirective quality that allows others to experience their own thoughts and emotions, and this can lead to a better understanding of the self and others.

### *Assessing Empathy*

It is common to measure empathy through self-report questionnaires, such as the Interpersonal Reactivity Index (IRI) (Davis, 1980; 1983). This 28-item measure includes several important aspects of empathy, but is not exhaustive of all possible reactions to others. It is composed of four seven-item subscales independent of one another, that tap into specific features of a broader definition of empathy. Scoring higher on one or more subscale indicates greater empathy, while lower scores across all subscales suggests a lower empathic tendency overall. Davis (1980) describes empathy in terms of four elements:

*Perspective-taking:* The perspective-taking (PT) subscale targets cognitive empathy, as it is designed to assess the ability to adopt the psychological viewpoints of others. Higher scores on the PT subscale are associated with greater social functioning and self-esteem among men and women. High perspective takers are suggested to exhibit more selfless concern for the feelings of others. Perspective-taking appeared to be unrelated to levels of intelligence, as measured by SAT scores. Overall, an individual high in PT can be seen as a “psychologically healthy, happy person possessing a constellation of traits associated with high achievement and success.”

*Fantasy scale:* The fantasy subscale (FS) also targets cognitive empathy and assesses the ability to imagine the feelings and actions of fictional characters in books, movies, and plays. The tendency to adopt the perspective of fictitious characters was found to be associated with greater emotional reactivity, verbal intelligence, and introspection. High fantasizers, especially men, are suggested to exhibit more shyness and social anxiety.

Because the FS implies involvement with fictitious characters, it is plausible that high fantasizers might engage in non-social activities like reading books or watching movies and television more frequently.

*Empathic concern:* The empathic-concern (EC) subscale targets emotional empathy, as it assesses feelings of sympathy and concern for those in distress, or “other-oriented” sentiments. This subscale is suggested to be strongly associated with selflessness and concern for the well-being of others. Similar to the FS, higher EC scores can be indicative of greater emotional reactivity and helping behaviors. Empathic-concern is generally related to reported feelings of warmth and compassion for others. The EC subscale is similar to PT in that they are characterized by more selflessness. However, high EC respondents typically report greater amounts of anxiety and discomfort, unlike high perspective-takers.

*Personal Distress:* The personal distress (PD) subscale targets emotional empathy and measures personal anxiety and unease in tense social situations, or “self-oriented” feelings. Higher scores are associated with multiple indications of poor social functioning, (e.g. lower self-esteem, lower social competence, and less extraversion.) Additionally, reported feelings of more social anxiety and shyness are associated with higher scores in PD. High PD respondents exhibit substantially greater emotional reactivity than any other subscale, and susceptibility to chronic fearfulness. Thus, the context of emotionality in this domain is characterized by greater amounts of fearfulness

and vulnerability. Generally, the PD subscale describes a tendency towards greater self-concern, vulnerability to emotional reactivity, and poor interpersonal functioning.

In summary, the IRI distinguishes four components that specify independent facets of empathy. Lower scores across each of these domains suggests that a respondent has a lower tendency to be empathic, at least in these modes of empathy. Of course, there are other possible factors that can determine whether a person is more or less empathic, but this measure focuses on important cognitive and emotional aspects that can be used to determine empathy to some degree.

### *Linguistic Inquiry and Word Count (LIWC)*

Some evidence suggests that identifying empathic people can be accomplished by examining the language they use in written communications (Otterbacher et al, 2017). The work in this vein builds off of a work pioneered by Pennebaker and colleagues (2003).

Linguistic Inquiry and Word Count (LIWC) is a word counting computer software tool developed by James W. Pennebaker and colleagues (2003). Pennebaker has conducted extensive research examining the effect of expressive writing on improved health outcomes. In one of those studies, participants who were asked to write about deeply personal, emotional disturbances in their lives appeared to have less health center visits in the six months following the experiment (Pennebaker & Beall, 1986). More studies confirming similar findings led Pennebaker and colleagues to investigate possible factors of the writing samples that may have accounted for improved health outcomes. Initially, large groups of researchers conducted content analyses on the essays. The

degree to which the essays were organized, coherent, emotional, optimistic, etc., were rated by trained research assistants (Tausczik & Pennebaker, 2010). This method proved to be too complex, as judges could not agree with each other and this procedure was time consuming and expensive. Hence, Pennebaker and colleagues developed a computerized linguistic analysis tool that eventually evolved into LIWC (Chung & Pennebaker, 2012).

LIWC is regularly used across the social sciences as a tool for quantitative text analysis. It references a dictionary of roughly 4,500 words and word stems that are organized in terms of grammatical, psychological, and content word categories. LIWC can be thought of as having two parts: the processing component and the dictionaries. The processing component imports files of text, such as essays or novels, and then compares each word of the text to those in the dictionaries selected by the user (Tauszik & Pennebaker, 2010). This process can be used to group text along psychological dimensions and to predict behavior. Identifying word features from these categories in text is one way to provide insight into the psychological and behavioral underpinnings of authors and speakers.

### ***Linguistic style and empathy***

A study of linguistic style and trait empathy found that Facebook users' vocabulary, categorized through LIWC, corresponded to their scores on Davis's Interpersonal Reactivity Index (IRI) (Otterbacher et al., 2017.) All participants completed the IRI survey and gave permission to the authors to access their Facebook profiles (e.g. Facebook posts, comments, etc.) for purposes of the study. These researchers used the IRI scores to derive different empathy types using cluster analysis. Four types of empathy were identified: other-oriented, low empathy, cognitive empathic, and self-oriented

empathic. Other-oriented individuals' were characterized as feeling and understanding the thoughts and emotions of others. The "low empathy" cluster consisted of those scoring low on all subscales of empathy on the IRI, suggesting less sensitivity to the thoughts and feelings of others and themselves. Cognitive empathic individuals described those who understand the perspective of others but may not necessarily feel what others feel. The "self-oriented" cluster represented those who have the ability to relate to others but are most concerned with their own personal distress.

After measuring participants' trait empathy and processing their Facebook posts using LIWC, Otterbacher and colleagues related each empathy type to the frequency of word categories in each Facebook post. Significant differences between the categories of language used in Facebook posts and participants' empathy scores was reported. In other words, people were grouped based on their responses to a self-report empathy survey (IRI, Davis 1980) to have a tendency towards a particular mode of empathy (e.g. other-oriented, low empathy, cognitive empathic, and self-oriented empathic.) Members of each group were found to have used particular styles of language (e.g. pronouns, punctuation, present-tense words) more or less often. For instance, those scoring low on empathy were more likely to use pronouns such as "he/she," as compared to those in other empathy groups. In contrast, participants who achieved higher IRI scores were more likely to use punctuation and to write in the present tense. These findings present exciting evidence of one possible way to use linguistic markers to assess empathy.

### ***Connecting empathy, fiction, and language***

As mentioned earlier, empathy has been theorized to be elicited by exposure to fiction over time (Mar et al., 2006; Mar, Oatley, & Peterson, 2009; Djikic, Oatley, &

Moldoveanu, 2013; Kidd & Castano, 2013). We also know that empathy has been associated with the use of certain linguistic markers (Otterbacher et al., 2017). Thus, it is plausible to consider that avid readers are one population expected to have increased empathic abilities over time. More specifically, members of such a population may also exhibit changes in their linguistic styles. One possibility in support of these ideas is that people may be less likely to use language associated with lower empathy groups as they read more. For example, those who read more often may decline in their usage of the “he/she” pronoun, as past research has characterized this language category to be associated with lower empathy (Otterbacher et al., 2017). Another possibility is an increase in language associated with greater empathy as a function of reading more fiction. Following this logic, those reading more should use more punctuation and write in the present tense more often.

In order to investigate the relationship between fiction exposure and changes in empathy through linguistic analysis, two obvious components are needed: a group of individuals who read fiction, and text from those individuals to analyze. Book reviewers are one possible group fitting these criteria, as they read fiction and provide typed communications about what they read.

### ***Reviewing fiction***

The Goodreads website is a social media platform with nearly 35 million members, where readers can report information about books they have read in reviews. These reviews contain information such as ratings and opinions of books. Some users have been active members for years, while newer members may only have been active for days, weeks, or months. Readers may share their information with the public or may

control who is allowed to view their posts by having a private account. This study analyzed publicly displayed reviews from 100,000 randomly drawn accounts.

Reviews posted by readers were time-stamped, providing a timeline starting with a person's first review and ending with their most recent review. It was most appropriate to use this timeline structure to measure a person's change in empathy. Intuitively, readers posting more book reviews have been exposed to more fiction over time. Further, we assumed that a person who has posted ten or twenty reviews may reap the proposed psychological benefits of fiction exposure more so than a person who has posted one or two reviews.

Review content can be thought of in this study as a *response*, as readers provided their own personal reactions to what they have read. Some responses provided in-depth summaries and analyses of books like those found in newspapers or blogs. These types of responses required a person to reflect on their reading experience (e.g. plot, characters, theme) and explain their understanding of a book.

### ***Specific Aims***

Three predictions, based on previous research, were made.

- 1) In comparison to the first reviews an individual writes, later reviews will contain fewer he/she pronouns.
- 2) In comparison to the first reviews an individual writes, later reviews will have more punctuation.
- 3) In comparison to the first reviews an individual writes, later reviews will contain more present tense verbs.



Each hypothesis was tested using growth curve analysis conducted within a multi-level model framework. Conceptually, a linear model was created to best represent the sample, and each participant's growth can be understood in terms of deviations from the sample model. We expected to find associations between the number of reviews a person has written and the percentage of each review that reflects words associated with empathy.

## **Methods and Procedures**

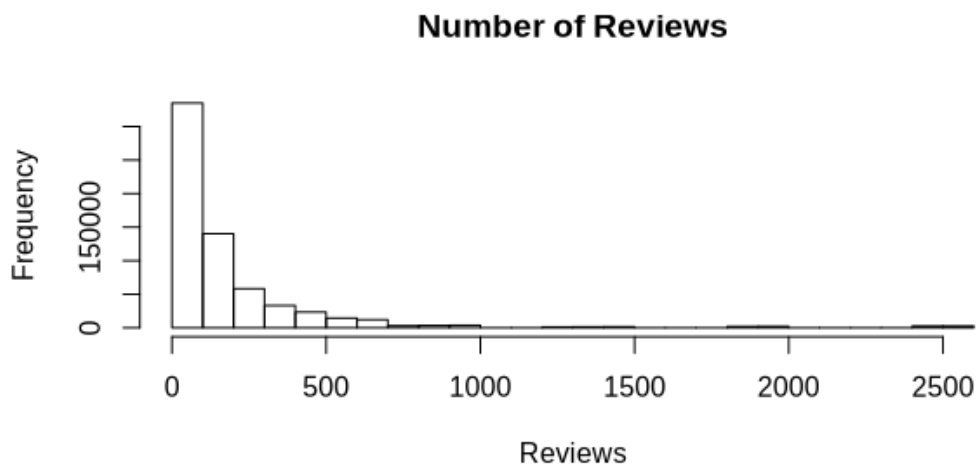
### ***Participants***

The participants in this study were 100,000 reviewers drawn from Goodreads.com. Some accounts have been active for years while others have existed for weeks or months. Readers may share their information with the public or may control who is allowed to view their posts by having a private account. This study only analyzed publicly displayed reviews from the sample. Other information displayed on a member's profile is the number of books they have rated and reviewed. Since we were interested in the linguistic styles used in reviews, the frequency of reviews containing language, rather than star ratings, is presented in Figure 1. As indicated in Figure 1, the prevalence of reviewers decreases as the number of books reviewed increases. It is common for participants to have reviewed between 0-100 books, suggesting that people in our sample were more likely to have reviewed fewer books. It was extremely rare for participants to have reviewed more than 500 books, suggesting that our sample had few members that reviewed many books. It could be possible that participants actually read more books than displayed in Figure 1, but did not submit a book review (e.g. only left a star rating). In this case, information about the amount of fiction participants have been exposed to

may be underrepresented in our sample. We examined the language used in written reviews using the sample described in Figure 1.

### **Figure 1**

*Total Number of Reviews Written*



### ***Human Subjects***

Participants voluntarily provided reviews of books they have read. When creating an account, members of the site are required to electronically sign a “Terms and Agreement” document, which includes the fact that the information they choose to share on this website is public. We used these de-identified reviews. Because the reviews were in the public domain, the IRB considered this project to be exempt from review.

This research posed no risk to participants. The personal information of members was kept confidential, in that members’ identifiable information was not studied (e.g. demographics, names, review content) or discussed in our research. In fact, the samples in this study, we anticipate, will more than likely never be affected by the research we conducted using these reviews.

### **Statistical Analysis**

### ***Data Analysis***

Each review for each participant was decomposed into words and then matched with LIWC dictionaries. For each review we calculated the proportion of words in a review that was drawn from each category (“he/she” pronouns, punctuation, present tense). We modeled change over time using an unconditional linear growth model, which allowed us to demonstrate a linear relationship between fiction exposure and usage of each linguistic marker. The following equation was calculated for each linguistic feature:

$$Y_{ti} = [\underbrace{\gamma_{00} + \gamma_{10} T_{ti}}_{fixed}] + [\underbrace{u_{0i} + u_{1i} T_{ti} + \varepsilon_{ti}}_{random}]$$

Fiction exposure was represented by the number of book reviews written (e.g. time predicting variable or “T”). As we are interested in measuring change in empathy as more books are read, time is most appropriately represented using review order (e.g. Review 1, 2, 3, and so on). The log transformation of review order was used, as this provided the most normal distribution for time and the best model fit. In the equation above, each linguistic style was tested in a separate analysis, with Y corresponding to each linguistic style (punctuation, “he/she” pronoun, present tense verbs). These models yielded a slope and intercept for each linguistic style, providing a trajectory for each linguistic marker as a function of the number of reviews written. This allowed us to test each hypothesis by using multi-level modeling to relate the development of growth curves within the population with the number of books read.

### ***Results***

Table 1 presents descriptive statistics of each linguistic marker and review order:

Table 1

*Descriptive statistics for review order and linguistic categories*

Variable	sd	mean
Review Order	1.4583	4.2917
Punctuation	11.50	18.01
“he/she”	2.00	1.02
Present tense	5.00	5.37

Hypothesis 1 predicted a significant decrease in the “he/she” pronoun category as review order increased. The results do not suggest that hypothesis 1 is confirmed, and in fact, the use of the “he/she” pronoun does not change significantly (see Table 1).

Hypotheses 2 predicted a significant increase in the punctuation category as review order increased. This was tested using the multilevel modeling method described previously.

The results presented in Table 1 suggest that hypothesis 2 was confirmed. Indeed, punctuation usage increases as the number of reviews increases. Finally, hypothesis 3 predicted a significant increase in present tense verb usage as review order increased. The results do not appear to confirm this prediction, as there is not a statistically significant increase in the present tense word category as time goes on.

Table 1

*Effects of review order on linguistic categories*

Linguistic Marker		Estimate	SE	df	t value	Pr(>t)
Punctuation	(Intercept)	17.1229	0.1823	3782.02	93.8939	< 0.0000 ***
	Review Order	0.2385	0.0495	2204.97	4.8157	0.0000 ***

“he/she”	(Intercept)	0.7698	0.0266	4318.69	28.867	< 0.0000 ***
	Review Order	0.0122	0.0072	3482.50	1.694	0.0904
Present tense	(Intercept)	5.3764	0.0764	3134.51	70.3238	< 0.0000 ***
	Review Order	-0.0259	0.0192	1669.59	-1.3458	0.1790

\*\*\*p<0.001.

## Discussion

The findings indicate a significant increase in punctuation use as more books were read, as predicted. Past researchers attributed this rise to the possibility that users may be expressing emotion more often or engaging with others through asking questions (Otterbacher et al., 2017). More specifically, users may be articulating excitement through exclamation marks, or inviting others to contribute to a book discussion through question marks. We must also consider that facial expressions such as smiling, crying, and so on are sometimes depicted on social media by using combinations of punctuation marks such as colons and parentheses. It could be that users are articulating different emotions more often through these facial expressions. One way to investigate this possibility would be to calculate the frequency of each punctuation mark. For instance, question marks may be used more frequently than colons and parentheses. This could be interpreted as users posing more questions rather than forming more emoticons in reviews.

On the other hand, increased punctuation may also suggest greater use of a formal style of writing among users in general, which could be attributed to one’s writing skills improving as more books are read. For instance, readers may learn to use proper

punctuation (e.g. oxford comma) through more exposure to formally written texts. In summary, greater punctuation use was found to be associated with reading more, but future research is needed to determine the driving forces behind this behavior.

We predicted a decline in “he/she” pronoun usage as more books were read, but instead found no significant decrease in this word category. This prediction was based off of past findings that indicated lower empathy individuals used less “he/she” pronouns in Facebook posts (Otterbacher et al., 2017). Less use of this category was expected to be associated with reviewing more because individuals could have become more empathic and more likely to use first or second person pronouns rather than third person pronouns. For example, participants may be attempting to identify with others or understand other perspectives by using words like “you” and “your,” rather than “he” or “she.” Suppose two individuals were discussing a novel: a more empathic individual might ask, “What do *you* think about...” in order to gain some sense of the other person’s thoughts or feelings. Thus, a decrease in these less direct pronouns (“he/she”) was anticipated.

It could be that avid readers are inherently empathic, or have reaped the proposed benefits of reading fiction before the study was conducted. In these cases, a decrease in “he/she” pronoun usage would not be observed. Further, those with stronger empathy skills would not be likely to show a decline in “he/she” pronouns, as it is possible they already use them less often. It is also possible that less empathic individuals may not be as likely to have an account on Goodreads.com. They may spend their time engaging in activities other than reading and reviewing, and thus would not be appropriately represented in our sample. Overall, there was not a significant decline in “he/she”

pronoun usage; but, our sample may not have accurately represented individuals with empathy levels low enough to demonstrate change.

Surprisingly, the findings do not suggest an increase in the use of present tense. We based our prediction of an increase in this category off of past findings indicating more use of past tense language and less use of present tense language in low empathy individuals (Otterbacher et al., 2017). It was thought that a rise in empathic ability might encourage participants to reach out directly to others, as opposed to communicating about past or future oriented ideas. For example, one with greater interpersonal skills might connect with others by discussing topics related to what others are currently expressing to them during interactions, rather than bringing up past experiences that do not fit best with the current interaction. If two people were discussing the emotional distress they felt while reading a particular passage, and one person brought up a time when they read a hilarious passage, this could demonstrate less empathic ability. One possible explanation for the nonsignificant finding for present tense could be that it is common for users to provide a brief summary of the book they have read, which is usually written in past tense. For example, someone might write “This book is about a detective who investigated a case and discovered more about herself along the way,” before discussing their own opinion of the book. Sometimes reviewers only summarize books, while others provide additional feedback that may be more likely to be written in present tense. Another possibility is that language used in Facebook postings may differ from book reviews in general. It may be the case that Facebook posts are more likely to contain present tense verbs than book review responses. In summary, there was not a significant

increase in present tense language as predicted; but, the type of language used in Facebook posts and book reviews may differ.

To summarize, previous research is equivocal about the connection between reading fiction and empathic development. Past studies have connected fiction exposure to improved empathy skills (Djikic et. al 2013; Kidd & Castano 2013; Mar et. al 2006; 2009). More recently, studies investigating this same relationship propose that the effects of fiction on empathy may occur gradually, rather than immediately (Bal & Veltkamp 2013; Panero et al., 2018; Samur et al., 2016). It was also suggested that Facebook users' linguistic styles in their posts, such as using more punctuation and present tense verbiage, was associated with greater trait empathy; while using the "he/she" pronouns more often was suggested to be associated with less trait empathy (Otterbacher et al., 2017). Thus, analyzing linguistic style to investigate the relationship between fiction and empathic development was an appropriate way to test our hypotheses.

More specifically, Bal and Veltkamp measured empathic development through a three question self-report questionnaire and examined its effects across one week's time. Our study measured empathy more objectively through linguistic analysis, and across months to years of time. Mar and Oatley ruled out alternative explanations for the relationship between empathy and narrative exposure, such as individual differences in personality (2009). This same study also found a positive association between empathy and narrative fiction print-exposure. A series of experiments conducted by Kidd and Castano reported that reading short fictional texts, particularly literary fiction, improved theory of mind skills (2013). Alternatively, two recently attempted replications of these experiments were unable to confirm that any type of fiction significantly improved theory



of mind skills, but did suggest that the proposed effects of fiction may be observed over time rather than immediately (Panero et al., 2018; Samur et al., 2016).

Taking these findings into account, this study explored possible improvements in empathy through reading greater amounts of fiction over longer periods of time than past research has investigated. This study used language categories associated with higher or lower empathy levels to detect improvements in this domain. We anticipated changes in linguistic style of reviewers as a function of reading more books over time. Our findings, in part, provide further meaning to the preexisting evidence connecting fiction exposure and empathy.

### *Limitations*

One limitation of this study is that using particular linguistic styles may be associated with education level, rather than empathic ability. In other words, reviewers may be using different language as a function of education. For example, less educated individuals might use punctuation less frequently and therefore the effect of reviewing on punctuation usage might be misrepresented. It could also be that less educated people have used pronouns incorrectly, and therefore their words are misinterpreted. For instance, we might think a person using the “he/she” pronoun shows less empathy, while this individual may be attempting to identify with others, even though the first or second person pronoun would have been grammatically true. Perhaps someone writes, “What *she* think,” rather than “What do *you* think?” In this case, a person may be trying to understand another perspective, but they are simply using incorrect grammar. This study did not allow for this type of distinction to be made.

Alternatively, the education level of participants may have improved as a function of reading more books. A person whose education level has improved upon reading more frequently, for instance, may show an increase in punctuation usage. This study could have misinterpreted the previously described observation for an increase in empathy. In summary, a person may have exhibited changes in linguistic style due to improvements in their knowledge of grammar and writing, rather than as a result of empathic growth.

In addition to education level confounding book reviewing, it is also important to consider that less empathic individuals may not be proportionately represented in the study sample. Perhaps, the connection between reading fiction and empathy is mostly observed in more empathic people to begin with. In this case, it may not be as common for reviewers on *Goodreads* to have lower empathy levels, and therefore changes in empathy would be less likely to be observed. The study sample was randomly drawn from *Goodreads.com*, but this does not exempt our data from potentially misreporting on different empathy levels. It is also possible that reviewers may not have completely read the book they are writing about online. Unfortunately, it is difficult to determine whether an individual has read the book they are reviewing at all. This study did not account for this possibility during data analysis.

### ***Potential Implications***

In addition to advancing knowledge about empathy and fiction, this study has important real-world applications. Recently, the United States has adopted a new set of education standards that calls for less emphasis on fiction literature in secondary education (Mosle 2012). Those in support of this change argue that non-fiction literature promotes skills most appropriate for successful careers in the workplace. Indeed these

skills are important, but opponents of this notion remind us that fiction literature is of equal importance in developing a well-rounded citizen. Former U.S. Assistant Secretary of Education, Diane Ravitch, commented on this reform, called the Common Core State Standards, “I can’t imagine a well-developed mind that has not read novels, poems, and short stories (2012).” This study provides empirical evidence in support of the influence of fiction literature requirements in classrooms.

Hester and Schleifer predicted that reading narratives could be implemented as a form of empathy training in healthcare students (2016). The logic behind this training assumed that theory of mind and empathy could be produced and enhanced through teaching and reading narratives. However, more evidence including a larger sample size is needed to support their findings. There are a collection of studies examining the positive effects of narrative fiction interventions to foster empathy in healthcare professionals (Adamson et al. 2018); (Rappaport et al., 2017); (Richardson et al., 2015). Our study contributes to the understanding of empathic growth in medicine and potentially establish grounds for further exploration of utilizing fiction most appropriate in this field.

### ***Future Directions***

Future research should explore the long-term effects of fiction exposure on empathy using an experimental research design. An experimental design would allow investigators to assess participants’ empathic ability, perhaps by administering the IRI, or another empathy measure. This measure could act as a validation to assess how accurately changes in linguistic features demonstrates increased empathic ability. If participants were to score high in empathy and use the punctuation category more

frequently, for instance, increased punctuation could be endorsed as an accurate measure of empathy in fiction readers. Additionally, conducting an experiment would expand our participant knowledge, as demographic and personality information could be collected from the entire sample. Understanding differences in the impact of fiction exposure on empathy amongst gender, age, and personality would be valuable. This information could be advantageous, for instance, when deciding the role of fiction literature in classrooms or empathy training for professionals. In general, obtaining evidence about the causal relationship between fiction, linguistic analysis, and empathy is definitely needed.

## References

- Adamson, K., Sengsavang, S., Charise, A., Wall, S., Kinross, L., & Balkaran, M. (2018). Narrative Training as a Method to Promote Nursing Empathy Within a Pediatric Rehabilitation Setting. *Journal of Pediatric Nursing*, 42, e2–e9. <https://doi.org/10.1016/j.pedn.2018.06.011>
- Bal PM, Veltkamp M (2013) How Does Fiction Reading Influence Empathy? An Experimental Investigation on the Role of Emotional Transportation. *PLoS ONE* 8(1): e55341. <https://doi.org/10.1371/journal.pone.0055341>
- Chung, C. & Pennebaker, J. (2012). Linguistic Inquiry and Word Count (LIWC): pronounced “Luke”,... and other useful facts.. 10.4018/978-1-60960-741-8.ch012.
- Davis, Mark. (1980). A Multidimensional Approach to Individual Differences in Empathy. *JSAS Catalog Sel. Doc. Psychol.* 10.
- Davis, Mark. (1983). Measuring individual differences in empathy: Evidence for a multidimensional approach. *Journal of Personality and Social Psychology*.
- Decety, J., & Moriguchi, Y. (2007). The empathic brain and its dysfunction in psychiatric populations: implications for intervention across different clinical conditions. *BioPsychoSocial Medicine*, 1, 22.
- Djikic, Maja & Oatley, Keith & Moldoveanu, Mihnea. (2013). Reading Other Minds: Effects of Literature on Empathy. *Scientific Study of Literature*. 3. 28-47. 10.1075/ssol.3.1.06dji.
- Djikic, M., & Oatley, K. (2014). The art in fiction: From indirect communication to changes of the self. *Psychology of Aesthetics, Creativity, and the Arts*, 8(4), 498-505.
- Gerdes, K., Segal, E., & Lietz, C. (2010). Conceptualising and Measuring Empathy. *British Journal of Social Work*, 40(7), 2326–2343. <https://doi.org/10.1093/bjsw/bcq048>
- Gerrig, R. J. (1993). *Experiencing narrative worlds: On the psychological activities of reading*. New Haven, CT, US: Yale University Press.
- Hester, Casey; Schleifer, Ronald. Enhancing Physician Empathy: Optimizing Learner Potential for Narrative Transportation. *Enthymema*, [S.l.], n. 16, p. 105-118, dec. 2016. ISSN 2037-2426.
- Kidd, David & Castano, Emanuele. (2013). Reading Literary Fiction Improves Theory of Mind. *Science* (New York, N.Y.). 342. 10.1126/science.1239918.

- Mar, R. A., Oatley, K., Hirsh, J., dela Paz, J., & Peterson, J. B. (2006). Bookworms versus nerds: Exposure to fiction versus non-fiction, divergent associations with social ability, and the simulation of fictional social worlds. *Journal of Research in Personality*, 40, 694-712.
- Mar A, Raymond & Oatley, Keith & Peterson, Jordan. (2009). Exploring the link between reading fiction and empathy: Ruling out individual differences and examining outcomes. *Communications*. 34. 407-428.
- Melchers, M. C., Li, M., Haas, B. W., Reuter, M., Bischoff, L., & Montag, C. (2016). Similar Personality Patterns Are Associated with Empathy in Four Different Countries. *Frontiers in psychology*, 7, 290. doi:10.3389/fpsyg.2016.00290
- Mooradian, Todd & Davis, Mark & Matzler, Kurt. (2011). Dispositional Empathy and the Hierarchical Structure of Personality. *The American journal of psychology*. 124. 99- 109. 10.5406/amerjpsyc.124.1.0099.
- Mosle, S. (2012, November 22). What Should Children Read? *New York Times*. Retrieved from <https://opinionator.blogs.nytimes.com/2012/11/22/what-should-children-read/>
- Obama, Barack. (2009, April 7). Remarks of President Barack Obama At Student Roundtable. *The White House: Office of the Press Secretary*. Retrieved from The White House President Barack Obama website <https://obamawhitehouse.archives.gov/realitycheck/the-press-office/remarks-president-barack-obama-student-roundtable-istanbul>
- Otterbacher, J., Ang, C., Litvak, M., & Atkins, D. (2017). Show Me You Care: Trait Empathy, Linguistic Style, and Mimicry on Facebook. *ACM Transactions on Internet Technology (TOIT)*, 17(1), 1–22. <https://doi.org/10.1145/2996188>
- Panero, M., Weisberg, D., Black, J., Goldstein, T., Barnes, J., Brownell, H., & Winner, E. (2016). Does Reading a Single Passage of Literary Fiction Really Improve Theory of Mind? An Attempt at Replication. *Journal of Personality and Social Psychology*, 111(5), e46–e54. <https://doi.org/10.1037/pspa0000064>
- Pennebaker, J., Beall, S., & Fowles, D. (1986). Confronting a Traumatic Event: Toward an Understanding of Inhibition and Disease. *Journal of Abnormal Psychology*, 95(3), 274–281. <https://doi.org/10.1037/0021-843X.95.3.274>
- Pennebaker, J. W., Francis, M. E., & Booth, R. J. (2003). Linguistic inquiry and word count: LIWC2001 manual. Mahwah, NJ: Erlbaum.
- Premack, D., & Woodruff, G. (1978). Does the chimpanzee have a theory of mind? *Behavioral and Brain Sciences*, 1(4), 515-526. doi:10.1017/S0140525X00076512

- Rappaport, N., Martin, A., & Kiley, G. (2017). Regeneration: A Performance and Narrative Monologue Workshop. *Journal of the American Academy of Child & Adolescent Psychiatry*, 56(10), S357–S357.  
<https://doi.org/10.1016/j.jaac.2017.07.771>
- Ravitch, D. (2012, May 19). Why Does David Coleman Dislike Fiction? Retrieved from <https://dianeravitch.net/2012/05/19/why-does-david-coleman-dislike-fiction/>
- Richardson, C., Percy, M., & Hughes, J. (2015). Nursing therapeutics: Teaching student nurses care, compassion and empathy. *Nurse Education Today*, 35(5), e1–e5.  
<https://doi.org/10.1016/j.nedt.2015.01.016>
- Rogers, C. (1957). The necessary and sufficient conditions of therapeutic personality change. *Journal of Consulting Psychology*, 21(2), 95–103.  
<https://doi.org/10.1037/h0045357>
- Samur, D., Tops, M., & Koole, S. (2018). Does a single session of reading literary fiction prime enhanced mentalising performance? Four replication experiments of Kidd and Castano (2013). *Cognition and Emotion*, 32(1), 130–144.  
<https://doi.org/10.1080/02699931.2017.1279591>
- Stueber, Karsten, "Empathy", *The Stanford Encyclopedia of Philosophy* (Spring 2018 Edition), Edward N. Zalta (ed.).  
<https://plato.stanford.edu/archives/spr2018/entries/empathy/>.
- Tausczik, Y., & Pennebaker, J. (2010). The Psychological Meaning of Words: LIWC and Computerized Text Analysis Methods. *Journal of Language and Social Psychology*, 29(1), 24–54. <https://doi.org/10.1177/0261927X09351676>
- de Vignemont, F., & Singer, T. (2006). The empathic brain: how, when and why? *Trends in Cognitive Sciences*, 10(10), 435–441. <https://doi.org/10.1016/j.tics.2006.08.008>