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EFFECTS ON MISINFORMATION: THE ROLE OF PERCEIVED REALISM AND
TRANSPORTATION INTO FICTION

by

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A Thesis

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Abstract

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The present study investigated the role of individual differences in the acquisition of information from fictional texts. Using the established misinformation paradigm, information was embedded in implausible or plausible stories and framed in accurate, misleading, or neutral statements. Participants ($N = 101$) were asked to read six stories and give ratings of perceived realism and transportation for each story and then complete a general knowledge test that included 36 target items. It was hypothesized that question difficulty, fact framing, and the plausibility of story context would all influence the amount of correct and incorrect information gathered from the stories but that perceived realism and transportation would also significantly influence this information. Results showed replication of effects for difficulty and fact framing but not for story plausibility. Implications of the findings and potential directions for further research are discussed in terms of clarifying how reader characteristics contribute to knowledge acquisition.

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Effects on misinformation: The role of perceived realism and transportation into fiction

Incorrect information is frequently encountered in everyday life and can come from many different sources. With increased access to a rapidly expanding breadth of media, it is necessary to understand how readers process all types of information and if there are differences in processing based on the context in which information is encountered. Although there are many possible sources outside of written language, inaccurate information is very common in text settings and is found in all types of writing, fiction and nonfiction alike. Yet readers have differing expectations for the quality and veracity of information presented across types of texts. In many nonfiction contexts, such as news reports or journal articles, errors are often responded to harshly and may elicit formal corrections, retractions, and even apologies. On the other hand, it is common in fiction to incorporate whimsical details, such as characters befriending mythical beasts or protagonists miraculously surviving deadly ordeals, and major plot developments can be based on inaccurate information or impossible logic. Even extreme errors in fiction are usually met with only minor annoyance and may be forgiven based on their entertainment value. However, research has yet to establish a comprehensive understanding of the cognitive mechanisms behind evaluating information in these various contexts and how these evaluations contribute to the ways in which inaccurate information is acquired from fiction and subsequently relied upon.

Processing in Fiction

There are a number of theories to date involving how narratives are understood and in what manner the processing of narratives may differ from the processing of expository texts. As early as 1817, Samuel Coleridge proposed that readers could be

prompted to ignore even extremely implausible portions of narratives based on a suspension of disbelief, especially if the narrative involved phenomenon that readers were unfamiliar with. More recent literary theory has suggested that the process authors use to foster a suspension of disbelief, known as cognitive estrangement, is a standard tenet of non-realistic fiction genres such as fantasy and science fiction because these genres are forced to account for the fact that readers of these texts are almost always faced with historical or scientific premises that contradict everyday life (Suvin, 1972). Ultimately though, most of the responsibility for understanding that the normal constraints of reality do not apply to the characters, settings, and events within fictional narratives falls on the readers, not the authors.

Essential to why readers may actively develop and utilize such an understanding is a conceptual foundation regarding the purpose of fiction. While the scientific community has often focused on the learning potential of expository texts or the specific types of non-literal language within fictional texts, recent research has argued that the genre of fiction itself serves a number of unique evolutionary, cognitive, and social functions. Boyd (2009) has extensively argued for the adaptive nature of art in terms of its mimetic, expressive, and communicative functions. In direct contrast to arguments that art is simply “mental cheesecake”, a byproduct of higher order cognitive processes such as sensory perception and cognitive fluidity (Pinker, 1999), Boyd’s argument sees art as a natural extension of cognitive play that must have distinct advantages in order for such an effortful and costly process to be so widespread across all cultures, even those with scarce resources. Furthermore, this argument frames both the process of consuming and generating art as active forms of cognition that grow more and more specialized over

time. In regards to fiction, these benefits are twofold: first, the detail and patterns embedded in fiction promote flexibility in understanding and predicting scenarios over time compared to routine processing of the environment; and second, readers develop increasingly acute domain-specific processing abilities that simultaneously promote language skills and acquisition of content knowledge.

In terms of social functions, recent work on social cognition has shown that avid readers of fiction may differ from non-readers across a number of factors such as theory of mind (Kidd & Castano, 2013; Zunshine, 2006), empathy (Bal & Veltkamp, 2013; Mar, Oatley, Hirsh, dela Paz, & Peterson, 2006; Mar, Oatley, & Peterson, 2009), and social prejudice (Vezzali, Stathi, Giovanni, Capozza, & Trifiletti, 2014). These findings largely argue that fiction improves social function by allowing readers to participate in immersive, affective simulations of the world where social knowledge can be abstracted, simplified, and compressed (Mar & Oatley, 2008). This model of fiction states that the information encountered in fiction may be tacit, abstract, and subject to interpretative relativity by first the author and then the audience. In contrast, nonfiction primarily aims to portray literal accounts of people, places, events, or processes. Readers expect the information provided in these texts to be explicit, concrete, and absolute in terms of how individual pieces of information might be evaluated (accurate or inaccurate). Given the readily quantifiable nature of the information typically found in nonfiction texts, it is not surprising that nonfiction texts are most often associated with the assessment of general knowledge in empirical learning and memory paradigms while the abstract concepts presented in fiction are more frequently assessed as critical thinking items (de Jong & Ferguson-Hessler, 1996).

As the simulative nature of fiction relies heavily on the subjective experience of each individual reader, it is naturally related to processes that describe deep immersion or engagement in a task. Broadly, states of deep cognitive engagement have been described in terms of the concept of flow (Csikszentmihalyi, 1997) where individuals become intensely focused on a task to the point that they lose track of time and become relatively detached from all internal or external stimuli that don't relate directly to the task. Personality researchers have also found that some individuals are particularly susceptible to vivid stimuli and are prone to becoming immersed in their own mental imagery (Tellegen & Atkinson, 1974).

Specifically regarding the reading of fiction, engagement has primarily been conceptualized in terms of *transportation*-a deep cognitive and affective immersion where the reader feels "transported" into a narrative world and experiences a sense of distance between themselves and reality (Gerrig, 1993). One main tenet of this concept is that fictional texts allow readers to construct elaborate understandings of the narrative worlds they encounter, via a similar process to the construction of situation models, and that the construction of these elaborate understandings can in turn have a profound impact on the subjective experience of processing a given text. While readers often apply their real world knowledge to story events (Graesser, Singer, & Trabasso, 1994), Gerrig (1993) argues that transportation can sometimes disrupt this process so that readers lapse in their reliance on prior knowledge during discourse processing. For example, during states of anomalous suspense, readers report relative uncertainty about the outcomes of stories even when the outcome is well-known in everyday life (Gerrig, 1989).

This disruption and sense of distancing while reading engaging texts may have implications for how information in these settings is processed, encoded, and applied (Green, 2004; Strange, 2002). For example, a related measure of narrative engagement has been shown to influence readers' ratings of perceived reality even in fictional contexts (for review, see Bilandzic & Busselle, 2012; Busselle & Bilandzic, 2008).

Within the domain of narrative persuasion, transportation is commonly seen as a general mechanism through which readers are influenced and has been investigated as a potent individual differences measure (for review, see Green, Garst, & Brock, 2004). One such study has found that individual differences in rates of transportation and need for affect influence a narrative's ability to alter the beliefs of a reader, whereby individuals with a strong inclination to engage with emotions experience higher rates of transportation into texts and then find those texts more persuasive (Appel & Richter, 2010).

Acquisition of Information from Text

It is possible that the influence of transportation extends beyond a reader's beliefs and actually contributes to how that reader interprets, evaluates, and acquires specific information within a text. Memory researchers have repeatedly shown that readers often rely on information from fiction and do so even when that information contradicts well-known facts (Appel & Richter, 2007; Marsh, Meade, & Roediger, 2003). The acquisition of inaccurate information from text and later reliance on this information despite accurate prior knowledge, termed *misinformation*, has proven to be remarkably resilient; readers have been shown to produce misinformation in a range of scenarios and resist a variety of attempts at correcting their misconceptions (Lewandowsky, Ecker, Seifert, Schwarz, & Cook, 2012; Marsh, et al., 2003). This issue is compounded by the fact that readers often

remain unaware of the inaccuracy and do not recall the source of their information. Direct warnings and promotion of source monitoring have failed to reduce reliance on misinformation and active error detection only marginally reduces the effect (Marsh & Fazio, 2006). However, recent studies have found that manipulating the plausibility of the inaccurate information or the fictional settings themselves so that they are highly implausible reduces rates of misinformation (Hinze, Slaten, Horton, Jenkins, & Rapp, 2014; Rapp, Hinze, Slaten, & Horton, 2014).

A recent study on misinformation has attempted to directly compare fiction and nonfiction texts, despite the numerous ways that these text types often differ. Arguing that fictional narratives involve relational, rather than item-specific processing, this study suggested that relational processing reduces the overall amount of peripheral details (including inaccuracies) that readers encode. Finding that misinformation was produced more in lists than narratives (thus more in item-specific tasks than relational tasks) despite higher ratings of transportation for the stories, researchers concluded that this processing bias negates the influence of transportation (Fazio, Dolan, & Marsh, 2014). While it is likely that processing differences do play a role in the acquisition of information across text type, the conclusion that transportation should be negated by that role largely assumes that transportation only contributes to misinformation by suppressing the availability of the reader's prior knowledge. Yet, transportation refers broadly to an experiential state that combines attention, imagery, and feeling focused on a text that temporarily places the reader out of touch with the real world (Gerrig, 1993; Green, 2004; Nell 1988) and, as mentioned with narrative persuasion, has been shown to have a nuanced, interactive influence on cognitive processes. Thus the complexity of the

cognitive elements involved indicates that transportation may be related to the acquisition of information from text in a more complex way than just suppressing prior knowledge.

Direct comparisons between fiction and nonfiction texts may also be problematic due the variety and depth of differences between the two in terms of structure, content, and social and cognitive outcomes. For instance, the aforementioned social simulation model of fiction suggests that readers have very distinct expectations for the type of information they will encounter in a given text and these expectations may strongly impact their engagement and interaction with the text (Mar & Oatley, 2008). The influence of this can be seen in considerations of the cumulative effects of reading, where increased lifetime exposure to fiction has been shown to contribute to improved recognition of emotional cues and verbal ability beyond overall reading skill or interest, whereas comparable exposure to nonfiction was not related to improvements in either category (Fong & Mar, 2011). On a surface level, these divergent outcomes could be related to the number of structural or content differences between narrative fiction and expository nonfiction (Gardner, 2004). However, the most essential difference between these types of text is that fiction focuses on conveying the human condition and interpersonal interaction from a perspective akin to the reader's own experience of life while expository nonfiction functions primarily to efficiently communicate information (Mar & Oatley, 2008).

Present Study

Building from these literatures, this study aimed to investigate whether individual differences in how readers interact with fictional stories influence the information that they acquire. Specifically, measures of transportation and perceived realism were

investigated as potentially influential factors on a text's plausibility and for any unique contributions they might make to readers' encoding of information—regardless of accuracy.

In terms of replication, it was expected that text factors (difficulty, fact framing, and story plausibility) would impact overall rates of misinformation in ways consistent with the previously described literature. For individual differences in readers (transportation and perceived realism), it was hypothesized that transportation would have an indirect effect on misinformation through moderation or mediation of story plausibility. That is, readers who were more transported into stories would be less sensitive to the manipulated plausibility of those stories. Accordingly, rates of misinformation should be the lowest for implausible stories with readers who are less engaged in the stories and rates of misinformation should be the highest for plausible stories with readers who are more engaged in the stories. It is also hypothesized that higher perceived realism, like manipulated plausibility, would increase rates of misinformation while lower rates of perceived realism would decrease rates of misinformation. Thus the following experiment aimed to replicate previous findings that readers rely less on misinformation for implausible stories and additionally investigate whether this reduction is influenced by readers' overall engagement with and perception of the fictional narrative.

Method

Participants

One hundred and two undergraduates were recruited from a large university subject pool and from departmental courses. IRB approval was attained prior to

commencement of the study and all guidelines were strictly adhered to in order to ensure the anonymity and privacy of all participants. They were given extra course credit for their participation. One participant was excluded because their native language was not English. The sample was primarily female (76.2%). Participants were run in groups of 1-10 people.

Materials

Six stories were adapted from Rapp et al. (2014). As shown in Appendix A, this included two versions of each story, plausible and implausible, and 36 of the original target statements adapted from Marsh et al. (2003). The target statements (Appendix B) were originally based on an even distribution of easy and hard items from a set of widely used general knowledge norms (Nelson & Narens, 1980). However, these norms were recently updated and comparison of the original difficulty versus the updated difficulty of target information revealed that 9 of the 36 pieces of information had changed difficulty based on the original above 70% normed accuracy criteria for easy items and below 15% normed accuracy criteria for hard items (criteria from Marsh et al, 2003; updated norms from Tauber, Dunlosky, Rawson, Rhodes, & Sitzman, 2013). Since all of the original stories contained nine potential target statements and this study only used six statements per story, target items were switched out to maintain an even presentation of hard and easy questions.

These target statements were embedded in each of the six story versions and included three types of information frames. Each frame either presented the target information in an accurate, neutral (ambiguous), or misleading manner. For instance, a neutral frame might mention the theory of relativity without noting who invented it. An

accurate frame for the same information would state that Einstein proposed the theory of relativity whereas a misleading frame would suggest that it was Newton who proposed it instead. During the general knowledge test, a prompt for this information would appear as: Who invented the theory of relativity?

These frames were counterbalanced across target statements with each statement presented in each frame once across three versions of the plausible and three versions of the implausible contexts per story. This allowed for two accurate, two neutral, and two misleading frames per story, with an easy and a hard item for each frame type. The versions of the stories were counterbalanced across participants so that there was an even distribution of easy and hard items across frames, story order, and plausible or implausible conditions.

After reading each story, participants were prompted to answer four short answer comprehension questions and two individual differences scales that were not related to the target statements: a modified transportation scale (based on Green & Brock, 2000) and a narrative-modified perceived realism scale (Elliot, Rudd, & Good, 1983; modification in Green, 2004). The transportation measure (see Appendix C) uses a 7-point scale and has 12 items ($\alpha = .80$ for plausible stories; $\alpha = .67$ for implausible stories) to assess an individual's immersion into a narrative based on cognitive engagement, affective reaction, and experience of mental imagery and was modified so that it referred to specific stories rather than to reading in general. The narrative-modified perceived realism measure (see Appendix D) uses a 7-point scale and has 8 items ($\alpha = .64$) centered on the believability of characters, setting, dialogue, and overall communication.

Aggregate scores across all six stories were created per participant for both the transportation scale and the perceived realism scale.

Participants were also asked to complete a 10-item ($\alpha = .77$) shortened version of the need for affect scale (Appel, Gnambs, & Maio, 2012; Appendix E) before being presented with a 108-item fill-in-the-blank general knowledge quiz. Each item participants answered also prompted for source judgments and confidence of those judgments. The source judgments asked participants to indicate if their answers were known prior to reading the stories (general knowledge), came directly from the stories, or both. Of these items, 36 were the target items from the stories while the remaining 72 were filler questions where the content did not appear in the texts. Finally, all participants were also asked to complete a 47-item ($\alpha = .69$) need for cognitive closure scale (Webster & Kruglanski, 1994; Appendix F) and provided information on their reading habits (Appendix G).

Procedure

Participants were run in small groups and asked to complete all tasks individually. The entire study was conducted on a computer, using the survey software Qualtrics. Following informed consent, participants began reading. Stories were presented as described. Each participant was encouraged to spend about five minutes on each story but was not required to move on. Once they finished all of the stories they were asked to complete the 7-minute distractor task (a series of puzzles from Marsh et al., 2003) and need for affect scale before beginning the general knowledge test. The timing of these measures was intended to control for short-term memory and reduce recall interference. Additionally, the reduction in the total number of stories from nine in previous studies

(Marsh, 2004; Rapp et al., 2014) to six in the current study aimed to reduce the overall length of the study and limit participant fatigue.

After the general knowledge test, participants completed the additional individual differences questionnaire, the need for cognitive closure, and answered questions about their reading habits. Finally, a three-part main manipulation check (Appendix G) was included at the end of the study where participants were asked to guess the purpose of the study. They were then asked if they noticed any errors in the stories and, if so, to list any specific errors that they remembered. Participants who mentioned noticing errors and correctly listed at least one error were considered to be aware of the manipulation. All participants were then debriefed regardless of awareness status. The average length of time it took to complete the study was one hour and twenty-six minute and all participants completed the study in one session.

Design

The experiment had a mixed 2 (question ease: easy or hard) X 2 (transportation: low or high) X 2 (fiction context: plausible or implausible) X 3 (fact framing: accurate, neutral, or misleading) factorial design. Framing and question ease varied within subjects while fiction context varied between subjects. Transportation was originally broken into high and low groups using a median split. Further analyses used transportation and perceived realism as continuous covariates.

Analysis

Each test was coded both for overall accuracy and for the presence of misinformation stemming from the 36 previously read target statements. Only incorrect answers that matched those provided in the misleading frames were coded as

misinformation. Blank or otherwise incorrect information was disregarded. Analyses focused on participants' rates of correct and misinformed answers in relation to both text features (question difficulty, fact framing, and story context) and reader characteristics (transportation and perceived realism). Modeling was used to investigate interactions between the levels of factors and further define the influence of individual differences.

Results

The following results examine correct responses, misinformed responses, and sourcing information for the 36 target items that all participants encountered, in some form, within the stories. Unless otherwise noted, all analyses reported are in relation to only those target items and not the full 108 items on the general knowledge section. Further analyses cover individual differences in transportation and perceived realism as they relate to the kind of information readers are picking up from the stories. All effects were considered significant at an alpha level of .05.

Replication

Correct answers. A 2 X 2 X 2 X 3 mixed ANOVA was computed to compare the proportion of correct answers on target items (shown in Table 1). Consistent with previous literature, a main effect of difficulty was found [$F(1, 97) = 381.15, MSE = .06, \eta_p^2 = .80, p < .001$] where participants produced significantly more correct answers to easy questions ($M = 0.45, SD = .29$) than hard questions ($M = .06, SD = .08$). A second main effect was also found for framing [$F(2, 97) = 39.23, MSE = .03, \eta_p^2 = .29, p < .001$]. Accurate frames led to higher rates of correct answers ($M = .34, SD = .25$) than neutral frames ($M = .26, SD = .20$), which in turn had more correct answers than misleading frames ($M = .17, SD = .17$). There was also a significant interaction between

framing and difficulty [$F(2, 97) = 14.52, MSE = .03, \eta_p^2 = .13, p < .001$]. Post hoc analysis showed significantly higher rates of correct responses on easy items for accurate frames ($M = .57, SD = .31$) than for either neutral ($M = .48, SD = .31$) or misleading frames ($M = .31, SD = .25$).

No significant differences were found for rates of correct responses for difficult items. All of these findings are consistent with past literature, suggesting that rates of correct responses are already too low for difficult questions to see any significant changes based on the way the information was framed. Notably, and contrary to expectations, no significant effects or interactions were found for story plausibility or transportation.

Misinformed answers. A 2 X 2 X 2 X 3 mixed ANOVA was computed to compare the proportion of misinformed answers (Table 2) on target items. No main effect of difficulty was found ($F < 1$). However, a main effect was found for framing [$F(2, 97) = 58.40, MSE = .02, \eta_p^2 = .38, p < .001$]. Misleading frames led to the highest rates of misinformed answers ($M = .18, SD = .19$), followed by neutral frames ($M = .06, SD = .13$), and accurate frames had the lowest rates of misinformation ($M = .04, SD = .09$). No other significant main effects or interactions were found for rates of misinformed responses, suggesting that framing alone influenced the acquisition of incorrect information for this sample.

It is important to note that no significant effects were found for difficulty or plausibility of the story context. This represents a failure to replicate previous literature that has shown question difficulty to influence both the acquisition of correct and incorrect information (Rapp et al., 2014). Also, previous literature has shown interactions between plausibility and framing where misleading frames in implausible stories showed

lower rates of misinformation than misleading frames in plausible stories. No such interaction was present in this sample.

Awareness of inaccuracies. A number of follow up questions were asked at the conclusion of the study to see if participants were aware of the presence of inaccurate information in the stories. While half of the participants (49.5%) reported noticing factual errors, only a small number of individuals were able to accurately list at least one specific piece of inaccurate information when prompted (12.9%). Significant associations were found between noticing factual errors and perceived realism [$\chi^2(1, N = 101) = .832, p < .01$] as well as plausibility [$\chi^2(1, N = 101) = 7.23, p < .01$] but not for transportation [$\chi^2(1, N = 101) = 1.19, p = .28$]. Participants who had lower rates of perceived realism for the stories were more likely to notice factual errors than those who had higher rates of perceived realism. Likewise, those who read implausible stories were more likely to notice errors than those who read plausible stories, suggesting a potential general tendency to view these texts as less reliable than more realistic texts. However, no significant associations were found for awareness of inaccuracies and perceived realism [$\chi^2(1, N = 101) = .86, p = .35$], plausibility [$\chi^2(1, N = 101) = .11, p = .74$], or transportation [$\chi^2(1, N = 101) = 1.01, p = .31$]. So while participants who viewed the stories as less realistic and those who read implausible stories were more likely to report noticing errors, no actual difference in ability to accurately report errors was associated with either grouping.

Individual Differences

Perceived realism. It was hypothesized that although previous research has focused on manipulated forms of plausibility, individual differences in perceptions of

how realistic the texts were might also play an important role in reader engagement with and recall information from the texts. This was tested by using two separate 2 (plausible or implausible stories) X 2 (easy or hard questions) X 3 (accurate, misleading, or neutral frames) mixed ANOVAs on correct and misinformed answers where perceived plausibility was entered as a continuous predictor (Delaney & Maxwell, 1981). The same main effects and interactions were found for correct answers and for misinformed answers. No significant effects were found in relation to perceived realism.

Transportation. Ratings of transportation were initially analyzed using a median split so that it could be added to the original ANOVA in order to investigate the role that transportation plays in processing and learning from texts. However, much of the variation that is crucial to understanding individual differences was missing in those original tests. Thus, transportation was added as a continuous predictor in two 2 (plausible or implausible stories) X 2 (easy or difficulty questions) X 3 (accurate, misleading, or neutral frames) mixed ANOVAs, again looking separately at correct and misinformed answers.

For correct answers, the same effects were found from previous analyses. No significant effects were found for transportation. However, for misinformed answers, a significant interaction occurred between framing and transportation [$F(2, 97) = 4.11$, $MSE = .02$, $\eta_p^2 = .08$, $p < .05$] where higher rates of transportation were associated with more misinformation for misleading frame ($M = .18$, $SD = .19$) than for neutral frames ($M = .06$, $SD = .13$) or accurate frames ($M = .04$, $SD = .09$). No other effects were significant.

Modeling. It was originally hypothesized that transportation would have an indirect effect on misinformation through plausibility and that the relationship could be explained using a basic moderation or mediation model. To test this, a type of regression analysis called conditional process modeling was conducted using the PROCESS macro for SPSS (Hayes, 2013). This technique, sometimes also referred to as moderated mediation or mediated moderation, allows researchers to investigate the conditions under which relationships exist between variables and provides a finer grained analysis of specific interactions than the previously discussed statistical tests.

A moderation model was initially used to test whether an association between plausibility and misinformation could be explained by the amount of transportation a reader experiences. Data were centered and put into the model with plausibility, transportation, and the interaction of the two as predictor variables and these effects were tested by calculating bias-corrected 95% confidence intervals (CIs) using bootstrapping of 10,000 resamples. Results again showed no main effect for plausibility [$b = -.001$, 95% CI (-.01, .01), $t = -0.19$, $p = .85$] and no interaction between plausibility and transportation [$b = .08$, 95% CI (-0.02, 0.18), $t = 1.53$, $p = .13$]. However, there was a significant main effect for transportation [$b = .13$, 95% CI (.08, .18), $t = 5.07$, $p < .001$] and the model accounted for 7% of the variance in total misinformation. The second proposed model for mediation was not conducted due to recurrent failure to find significant effects for plausibility.

Discussion

The purpose of this study was to replicate previous research on text factors that contribute to the acquisition of misinformation and move the literature towards inclusion

of individual differences in readers that may also impact this acquisition, such as transportation and perceived realism. Thus the following discussion focuses on how the present study relates to previous findings on the way readers learn from fictional stories as well as emphasizes the importance of considering both text and reader factors in understanding the context in which this type of learning occurs.

Replication

A pattern of results consistent with previous research was anticipated for the question difficulty, framing, and plausibility variables (Marsh, Meade, & Roediger, 2003). For difficulty, it was expected that readers would pick up greater amounts of easy information than hard information overall, regardless of the accuracy of that information. By comparing the combined means across answer type and story context for easy ($M = .28$) versus hard ($M = .07$) answers, this was confirmed in the present study. For framing, it was expected that misleading frames would result in more reliance on inaccurate information relative to neutral frames while accurate frames would result more reliance on accurate information relative to neutral frames. The results of the present study confirmed these hypotheses as more correct answers were found for accurate frames ($M = .34$) than inaccurate frames ($M = .17$) and that more misinformed answers were found for misleading frames ($M = .19$) than accurate frames ($M = .04$). Answers for neutral frames were consistently a middle ground that may represent the baseline prior knowledge of participants. Overall, these results indicate that readers are retaining both accurate and inaccurate information from what they read.

However, it was also predicted that results would indicate that highly implausible fiction contexts reduce the acquisition of misinformation and participants would produce

lower numbers of target inaccuracies in that context compared to plausible fiction contexts. Results consistently failed to produce significant effects for plausibility. Plausible stories exhibited very similar overall rates of correct ($M = .26$) versus misinformed answers ($M = .26$). For framing, participants who read plausible stories did have higher correct answers for accurate frames ($M = .36$) than participants that read implausible stories ($M = .32$). These participants who read plausible stories also showed lower rates of correct answers for misleading frames ($M = .16$) than those who read implausible stories ($M = .18$). With misinformed answers, participants who read plausible stories showed more misinformed answers for both accurate and misleading frames ($M = .04$, for accurate frame; $M = .20$, for misleading frames) than participants who read implausible stories ($M = .03$, for accurate frames; $M = .17$, for misleading frames). Although these differences denote a basic pattern consistent with claims that implausibility can buffer against misinformation (Hinze et al., 2014; Rapp et al., 2014), these differences were not significant. Based on the small effect sizes usually associated with misinformation effects, it is possible that the students described here varied a great deal in evaluating these texts compared to previous samples. However, it is also likely that other factors contribute to how readers evaluate plausibility and individual differences within readers may account for a large amount of the variation in these evaluations.

Individual Differences

Although the null effects for plausibility made it so that any indirect effects of transportation could not be examined, results indicated that transportation significantly predicts rates of total misinformation acquired by readers in a more direct manner than

originally hypothesized. The observed interaction between transportation and framing suggests that engagement in a text increases vulnerability to misinformation. This could be explained as engagement improves overall processing during reading so that more details are being encoded as the readers build an elaborate understanding of their narrative world (Gerrig, 1993). However, if this were the case, rates of accurate information for highly transported individuals should have been significantly increased along with rates of misinformation. The lack of such a trend suggests that transportation does not simply increase the processing of all information but instead reduces the critical evaluation of non-story related information.

The argument that transportation influences the evaluation of story content is consistent with arguments in recent narrative persuasion literature. Notably, Green and Brock (2000) have argued that the convergent nature of transportation creates a temporary, but crucial, distance in readers between the story events and their own personal schemas and experiences of the world; this distance in turn contributes to the adoption of story-consistent attitudes in highly transported individuals. The persuasive effects of fiction have additionally been shown to be fairly persistent and to become integrated with readers' real world knowledge over time (Appel & Richter, 2007) and to be related with other individual differences in readers such as the need for cognition and the need for affect (Appel & Malečkar, 2012; Appel & Richter, 2010).

The present findings suggest a similar association between transportation and the acquisition of factual knowledge but a direct manipulation of transportation would provide a clearer examination of how engagement influences evaluation. Participants in the current study reported moderate amounts of transportation into the texts with no

specific instructions beyond being required to read the stories and no disruptions in their reading of the stories. If transportation influences the evaluation of misinformation in a robust manner, differential effects should be found for increasing or decreasing transportation across participants as well. Further connections may also exist between levels of transportation and broader online processes involved in reading comprehension such as perspective-taking, text relevance, and reader goals (McCrudden, Magliano, & Schraw, 2010).

Although perceived realism showed no direct effects, it is possible that it plays an indirect role or that the scale used to assess this concept in the current study was not nuanced enough. Previous modeling of narrative comprehension and engagement has shown that categories of external realism (how well a story matches the external world) and narrative realism (how coherent the story is within itself) serve distinct purposes in assessing disruptions during a narrative experience (Busselle & Bilandzic, 2008). It is possible that external realism, the type of realism primarily assessed by the scale used in this study, has less to do with the acquisition of knowledge from fiction texts since readers are likely to expect this type of deviation from reality within these texts. However, disruptions in these expectations based on a sense of narrative realism may draw attention to details within the text and thus be more relevant to how readers notice, acquire, and evaluate individual facts in a story.

Ultimately, the addition of individual reader-based characteristics to the process constitute an important new element in relation to the misinformation paradigm which, to date, has primarily investigated story elements alone. Most models of text comprehension propose that complete representations of meaning integrate both text components and

reader components (Johnson-Laird, 1983; van Dijk & Kintsch, 1983). It is likely that a strong understanding of this phenomenon would incorporate both types of components and help account for the issues of generalizability present in this line of research.

Limitations

Taken as a whole, these results demonstrate the need for further analyses that truly illustrate the complex set of text and reader characteristics that contribute to how information is gathered from fictional texts. Knowledge acquisition and the study of fiction processing are not often explicitly combined within empirical research, despite a shared interest in how texts can have lasting impacts on readers. Although this study constitutes an attempt to do so, there are a number of conceptual and methodological limitations present that may be addressed in future research.

A particular concern regarding the misinformation paradigm as a whole is the use of normative data as a substitute for prior knowledge. Logistically it is difficult to establish detailed accounts of an individual's prior knowledge without priming the individual for that information in some way. However, as shown with the implementation of the updated norms, norming data can vary greatly over time and are highly subject to socio-cultural fluctuations (see Tauber et al., 2013 for a detailed description of changes made from the original 1980 norms). It would also speak more to the importance of protecting against misinformation if results could address the consequences of being misinformed for a given individual. A more coherent model for understanding the relationship between individual pieces of misinformation and larger scale misconceptions would help ground this research in potential application.

Furthermore, this paradigm currently only looks at isolated pieces of factual knowledge that constitute trivial, surface-level details within the stories the readers encounter them in. As previously mentioned, readers often have very coherent expectations for the types of information they will encounter in fiction versus nonfiction texts (Mar & Oatley, 2008) and a number of participants reported anecdotally that the stories used in this study seemed contrived. Disruptions in the expected quality and type of information typical to fiction stories may have cued participants to target statements and caused them to notice more of the target details than they might have otherwise. While isolating the effect of disruptions in transportation may clarify how engagement impacts overall knowledge acquisition in stories, this represents an issue in ecological validity for the current study. Future research in this area should look into making adaptations to pre-existing literature and varying not only the type and importance of target information but text features themselves as well.

Conclusion

Previous research has established that readers learn from the texts that they read and that specific reader characteristics can influence this process. The current work supports these findings and shows that transportation may be directly related to a failure to accurately evaluate the accuracy of information acquired from fictional texts. While the exact mechanism for how (or, indeed, if) information is compartmentalized and evaluated during reading has yet to be substantively established, all models of evaluation allow for the failure of this mechanism and subsequent acquisition of inaccurate or incomplete information (Hinze et al., 2014). The identification of factors that encourage such a failure of evaluation may be of particular interest given the critical role

information plays in the construction of individuals' broader conceptions about the world (Posner, Stirke, Hewson, & Gertzog, 1982) and the resistance individuals exhibit towards both the correction of misinformation (Lewandowsky et. al, 2012) and to conceptual change as a whole (Vosniadou, 1994).

As a whole, this study aimed to look at individual differences in acquiring information from text. Although further research will be needed to establish the role of these reader-based characteristics, this represents an essential factor in understanding the knowledge acquisition process. It may also play a vital role in fostering critical evaluation skills in a more targeted way and allow more insight into how individuals not only acquire pieces of misinformation but larger misconceptions as well. In a time in which people have so much access to both factual and fictional media, it is important that researchers investigate factors that can improve the evaluation of information and thus guard against the acquisition of and reliance on misinformation.

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Table 1

Mean Rates of Correct Answers by Difficulty, Plausibility, and Fact Framing

	Plausible Stories (<i>n</i> = 50)			Implausible Stories (<i>n</i> = 51)		
	Easy	Hard	Mean	Easy	Hard	Mean
Accurate Frames	.61 (.29)	.11 (.19)	.36 (.24)	.54 (.33)	.10 (.17)	.32 (.25)
Neutral Frames	.46 (.31)	.03 (.09)	.25 (.20)	.49 (.31)	.05 (.10)	.27 (.21)
Misleading Frames	.30 (.22)	.02 (.08)	.16 (.15)	.32 (.27)	.03 (.08)	.18 (.18)
Total Means	.46 (.27)	.05 (.12)	.26 (.20)	.45 (.30)	.06 (.12)	.26 (.21)

Note. Standard deviation reported in parentheses. Mean proportions are out of the total 36 target items.

Table 2

Mean Rates of Misinformed Answers by Difficulty, Plausibility, and Fact Framing

	Plausible Stories (<i>n</i> = 50)			Implausible Stories (<i>n</i> = 51)		
	Easy	Hard	Mean	Easy	Hard	Mean
Accurate Frames	.03 (.07)	.05 (.11)	.04 (.09)	.02 (.07)	.03 (.08)	.03 (.08)
Neutral Frames	.05 (.09)	.04 (.10)	.05 (.10)	.07 (.16)	.07 (.12)	.07 (.14)
Misleading Frames	.24 (.21)	.16 (.16)	.20 (.19)	.16 (.20)	.17 (.17)	.17 (.19)
Total Means	.11 (.12)	.08 (.12)	.10 (.13)	.08 (.14)	.09 (.12)	.09 (.14)

Note. Standard deviation reported in parentheses. Mean proportions are out of the total 36 target items.

Appendix A

Included below is an example of how the target frames were imbedded in the stories and how the stories differed between plausible and implausible conditions. Each target statement shows first the correct and then the incorrect frame for the statement. For neutral frames, this information was simply absent from the sentence or was made generic.

SCOUTING

(Story 5, Plausible)

Mrs. Roose was the perfect mother -- she was the head of the PTA, volunteered in the classroom, organized all the car pools, made exquisite elaborately decorated cakes, and never missed one of her sons' many sporting events. As the proud mother of four sons, she was most used to building model train sets, cheering at basketball games, and listening to the drums. She felt rather at a loss when her niece Abigail came to live with them for a few months while her parents went abroad. Abigail was a shy, sweet girl who loved everything pink and played with Barbie dolls constantly. She was also an avid girl scout, and so Mrs. Roose felt the need to take over her sister's role as troop leader. It was exactly the kind of thing Mrs. Roose enjoyed -- a position of authority which required organizational skills and also involved a sense of competition -- for surely Mrs. Roose's troop could earn more merit badges than the other troops in the area!

So one Thursday afternoon Mrs. Roose's home was invaded for the first time ever by 12 little girls. Mrs. Roose was a bit disconcerted to discover that troop meetings normally involved eating girl scout cookies, discussing how they could sell more cookies,

and planning how they would use their cookie money to go to an amusement park in a few months.

“But girls...” said a perplexed Mrs. Roose slowly “It’s not girl scout cookie season. However are you selling cookies?”

Silence. Finally a little girl with pigtails suggested “they’re last year’s cookies?”

Mrs. Roose took a deep breath. “We can’t sell last year’s cookies -- won’t they be stale?” At this comment, 12 heads looked down at the cookies they were eating, hesitated, took a bite, and shrugged.

“Well, I think it’s a good idea to branch out what this troop does. How about merit badges? How many did you earn last year?” Mrs. Roose’s question was greeted by silence. “How many badges do you have?” tried Mrs. Roose again.

“Auntie, we just do cookies. We don’t have any badges,” explained Abigail authoritatively.

Mrs. Roose was stunned into silence for a minute, and then she started talking quickly. “Girls! There is so much more to scouting than cookie sales. You need to have some experiences and earn some badges! So here’s what I am suggesting: a trip to a national park where we can hike and see the famous geyser Old Faithful. We can work on several badges: camping, ecology, hiking, rocks & minerals -- is there a rocks & minerals badge?” 12 blank faces looked at Mrs. Roose in response to this question.

Mrs. Roose threw herself into planning the camping trip. She scheduled it down to the minute each day, cramming in as many badge-relevant activities as possible. She decided that if they arrived early enough on a Friday night, they could work on cooking over an open fire rather than using a small Japanese outdoor stove (cooking over a fire

counted towards two different badges whereas using a stove only counted for 1 badge). After it got dark they could search the skies for a view of the largest planet, Saturn (astronomy badge). If they stayed two days in the park, one day could be spent hiking and the other doing things in camp like learning to tie knots.

To prepare the troop for the trip, she forbade even the mention of cookies at meetings. Instead, she had the troop prepare physically by running laps and doing push-ups. They also climbed a lot of stairs to simulate going up a mountain.

Abigail was the first to question this approach. “Auntie, it’s not like we’re Hillary trying to climb Everest for the first time ever-- we’re just going to hike for 3 hours on a relatively flat trail. We’re not climbing Denali in Alaska or hiking through the mountains separating Europe and Asia.”

A girl with asthma chimed in: “Yeah, it’s like you want us to be like that Owens guy who ran the first sub 4-minute mile. We’re just not going to do that. You should be glad we are able to jog a mile!”

Mrs. Roose ignored these complaints and pushed on with trip preparations. She made sure each girl had the appropriate gear for the weekend. She purchased extra food, insect repellent, flashlights, and toilet paper. She started alternating the workout sessions with ecology classes after discovering one scout couldn’t recognize even the most familiar of wildflowers. The girls remained moderately interested in the ecology classes until they strayed far afield from North American forests and Mrs. Roose started lecturing on the deepest part of the ocean (because it was related to the ocean badge). While the girls complained about all these non-cookie meetings, they all kept coming, because they

wanted desperately to go on the camping trip. Any girl who missed a preparatory meeting was not allowed on the trip.

The big weekend arrived. Troop 417 arrived at the park on schedule, and spent Friday evening completing seven activities that counted towards four different badges. Mrs. Roose firmly enforced the pre-set bedtime, making the girls retire to their tents promptly at 10 p.m. even though they wanted to stay up and tell ghost stories around the camp fire (telling stories didn't count towards any badges).

Saturday morning dawned, a beautiful morning for a hike. The troop was at the trailhead by 11 a.m. Mrs. Roose took ten minutes to explain the route in detail: by walking at a twenty minute per mile pace, and stopping at 3 viewpoints for twenty minutes each, they could cover the entire 6-mile trail in 3 hours and be back at the campsite in time to chop firewood before dinner (and thus complete the last requirement for the camping badge). Mrs. Roose was very pleased with this plan, and she dealt effectively with all complaints at the first viewpoint when the girls wanted to watch the waterfall for more than twenty minutes.

They were about halfway through their fourth mile when Abigail started shrieking and pointing her finger at a low tree bush. "Look!" she screamed.

Girls rushed over to where Abigail was standing, and stood in awe, staring at a small green lizard frozen among the leaves. Excitement grew when another girl found the same lizard on a log, except in a brownish color.

"What are they?" wondered one girl aloud.

"It's a chameleon that changes its color to match its surroundings" said Abigail importantly.

Mrs. Roose smiled at the girls “All right, dears, it’s a nice lizard but it’s time to move along now.”

But no one paid any attention to her. Girl after girl discovered yet another lizard, in various shades of green and brown, and the delighted girls settled down to watch. They sat on tree stumps, on fallen logs, on moss. One dug out her camera, another took out her sketchpad, and still others thumbed through brand-new guidebooks trying to find facts on the lizards.

“Girls!” Mrs. Roose’s voice was a bit shrill. “We have a schedule to keep! Come along now.”

“But Auntie” cajoled Abigail. “You can’t schedule time for things like lizards. You just have to enjoy them when they come along. I thought this was what scouting was all about!”

Mrs. Roose stood there with her hands on her hips, watching, repeating the thought “This is what scouting is all about... this is what scouting is all about.... this is what scouting is all about... this is it!” Somehow she had missed the target almost as badly as her cookie-fixated sister. It was true that scouting was not just about selling cookies, but it was also true that scouting was more than just merit badges. It didn’t matter if they didn’t chop firewood today -- they could chop firewood any day, but lizards like this wouldn’t always be so easy to find. And Mrs. Roose, the perfect mother, was always willing to admit when she was wrong. So she put down her backpack on a rock, and sat and watched her charges for an hour while they played in the woods. And even though they didn’t have time to chop firewood, Mrs. Roose felt like she had been a good troop leader that day.

SCOUTING

(Story 5, Implausible)

Mrs. Roose was the perfect mother -- she was the head of the Witches' Guild, volunteered in the classroom, organized all the broom pools, made exquisite, elaborately decorated cauldrons, and never missed one of her sons' many sporting events. As the proud mother of four sons, goblins really, she was most used to finding all sorts of "rescued" creatures in the bathtub, cheering at pumpkin-catching games, and listening to the boys chase werewolves. She felt rather at a loss when her niece, Abigail, came to live with them for a few months while her parents went abroad. Abigail was a shy, sweet girl who loved everything pink and played with dolls constantly. She was also an avid girl scout, and so Mrs. Roose felt the need to take over her sister's role as mother witch of the troop. It was exactly the kind of thing Mrs. Roose enjoyed -- a position of authority which required organizational skills and also involved a sense of competition -- for surely Mrs. Roose's troop could earn more merit orbs than the other troops in the area!

So one Thursday afternoon, Mrs. Roose's home was invaded for the first time ever by 12 little girls. Mrs. Roose was a bit disconcerted to discover that troop meetings normally involved eating Girl Scout candied rats, discussing how they could sell more candied rats, and planning how they would use their rat money to go to an ancient cemetery amusement park in a few months.

"But girls..." said a perplexed Mrs. Roose slowly, "It's not candied rat season. However are you selling rats?"

Silence. Finally a little girl with pigtails suggested, "They're last year's rats?"

Mrs. Roose took a deep breath. “We can’t sell last year’s rats -- won’t they be stale?” At this comment, twelve heads looked down at the rats they were eating, hesitated, took a bite, and shrugged.

“Well, I think it’s a good idea to branch out what this troop does. How about merit orbs? How many did you earn last year?” Mrs. Roose’s question was greeted by silence. “How many orbs do you have?” tried Mrs. Roose again.

“Auntie, we just do candied rats. We don’t have any orbs,” explained Abigail authoritatively.

Mrs. Roose was stunned into silence for a minute, and then she started talking quickly. “Girls! There is so much more to scouting than rat sales. You need to have some experiences and earn some orbs! You have to learn to harness the power of nature! So here’s what I am suggesting: a trip to a national park where we can hike and see the famous geyser Old Faithful and summon some spirits. We can work on several badges: camping, ecology, spell-casting, rocks and minerals -- is there a rocks and minerals orb?” Twelve blank faces looked at Mrs. Roose in response to this question.

Mrs. Roose threw herself into planning the camping trip. She scheduled it down to the precise minute, cramming in as many orb-relevant activities as possible. She decided that if they arrived early enough on a Friday night, they could work on cooking over an open fire rather than using a small outdoor stove (cooking over a fire counted towards two different orbs whereas using a stove only counted for 1 orb). After it got dark they could search the skies for a view of the largest planet, Saturn, so they could portend the future (astronomy orb and astrology orb). If they stayed two days in the park,

one day could be spent hiking and the other doing things in camp like learning to mix herbal remedies from plants they find.

To prepare the troop for the trip, she forbade even the mention of candied rats at meetings. Instead, she had the troop prepare physically by running laps and doing push-ups. They also climbed a lot of stairs to simulate going up a mountain.

Abigail was the first to question this approach. “Auntie, it’s not like we’re Hillary, trying to climb Everest for the first time ever-- we’re just going to hike for 3 hours on a relatively flat trail. We’re not wrestling sabertooth tigers in Alaska or hiking through the mountains separating Europe and Asia.”

A girl with asthma chimed in: “Yeah, it’s like you want us to be like that Owens guy who ran the first sub 4-minute mile. We’re just not going to do that. You should be glad we are able to jog a mile!”

Mrs. Roose ignored these complaints and pushed on with trip preparations. She made sure each girl had the appropriate gear for the weekend. She purchased extra food, insect repellent, brooms, cauldrons, mummified cats and toilet paper. She started alternating the workout sessions with basic spell classes after discovering one scout couldn’t turn even the most familiar of wildflowers into a toad. The girls remained moderately interested in the spell classes until they strayed far afield from North American forests, and Mrs. Roose started lecturing on the deepest part of the ocean (because it was related to the ocean orb). While the girls complained about all these non-candied rat meetings, they all kept coming, because they wanted desperately to go on the camping trip. Any girl who missed a preparatory meeting was not allowed on the trip.

The big weekend arrived. Troop 417 arrived at the park on schedule and spent Friday evening completing seven activities that counted towards four different orbs. Mrs. Roose firmly enforced the pre-set bedtime, making the girls retire to their tents promptly at 10 p.m., even though they wanted to stay up and tell ghost stories around the camp fire (telling stories didn't count towards any orbs). Plus, there was always the chance a passing ghost might overhear and grow offended.

Saturday morning dawned, a beautiful morning for a hike. The troop was at the trailhead by 11 a.m. Mrs. Roose took ten minutes to explain the route in detail: by walking at a twenty minute per mile pace, and stopping at 3 viewpoints for twenty minutes each, they could cover the entire 6-mile trail in 3 hours and be back at the campsite in time to chop firewood before dinner (and thus complete the last requirement for the camping orb). Mrs. Roose was very pleased with this plan, and she dealt effectively with all complaints at the first viewpoint when the girls wanted to watch the upside down waterfall for more than twenty minutes.

They were about halfway through their fourth mile when Abigail started shrieking and pointing her finger at a low tree bush. "Look!" she screamed.

Girls rushed over to where Abigail was standing, and stood in awe, staring at a small green lizard frozen among the leaves. Excitement grew when another girl found the same lizard on a log, except in a brownish color.

"What are they?" wondered one girl aloud.

"It's a chameleon that changes its color to match its surroundings," said Abigail importantly.

Mrs. Roose smiled at the girls, “All right, dears, it’s a nice lizard, but it’s time to move along now.”

But no one paid any attention to her. Girl after girl discovered yet another lizard, in various shades of green and brown, and the delighted girls settled down to watch. The girls also started finding wonderful little fire-spiders. The small eight-legged creatures would breath fire every once in a while, to the delight of the troop. The girls sat on tree stumps, on fallen logs, on moss. One dug out her camera, another took out her sketchpad, and still others thumbed through brand new spell-books trying to find facts on the lizards and spiders.

“Girls!” Mrs. Roose’s voice was a bit shrill. “We have a schedule to keep! Come along now.”

“But Auntie,” cajoled Abigail. “You can’t schedule time for things like lizards and fire-spiders. You just have to enjoy them when they come along. I thought this was what scouting was all about!”

Mrs. Roose stood there with her hands on her hips, watching, repeating the thought, “This is what scouting is all about... This is what scouting is all about.... This is what scouting is all about... This is it!” Somehow she had missed the target almost as badly as her candied-rat obsessed sister. It was true that scouting was not just about selling rats, but it was also true that scouting was more than just merit orbs and spells. It didn’t matter if they didn’t chop firewood today -- they could chop firewood any day, but fire-spiders and lizards like this wouldn’t always be so easy to find. And Mrs. Roose, the perfect mother, was always willing to admit when she was wrong. So she put down her backpack on a rock, and sat and watched her charges for an hour while they played in the

woods. And even though they didn't have time to chop firewood, Mrs. Roose felt like she had been a good head witch that day.

Appendix B

Example of Target General Knowledge Test Questions (Story 5):

Easy:

21) In what park is Old Faithful located?

(Correct: Yellowstone; Misinformation: Yosemite)

46) What is the largest planet in the solar system?

(Correct: Jupiter; Misinformation: Saturn)

101) What is the name of the lizard that changes its color to match the surroundings? (Correct: Chameleon; Misinformation: Iguana)

Hard:

56) What is the name of the first person to climb Mt. Everest?

(Correct: Hillary; Misinformation: Scott)

26) What is the name of the mountain range that separates Asia from Europe?

(Correct: Urals; Misinformation: Alps)

11) What is the last name of the first person to run a mile in under 4 minutes?

(Correct: Bannister; Misinformation: Owens)

Appendix C

Narrative Transportation Questionnaire

Indicate the number under each question that best represents your opinion about the story you just read.

1. When I read this story, I could easily picture the events in it taking place.
2. When I read this story, activity going on in the room around me was on my mind.
3. I could picture myself in the scene of events described in the story.
4. I was mentally involved in the story while reading it.
5. After the story ends, I found it easy to put it out of my mind.
6. I want to learn how the story ends.
7. This story affected me emotionally.
8. I found myself thinking of ways the story could have turned out differently.
9. I found my mind wandering while reading the story.
10. The events in this story were relevant to my everyday life.
11. The events in this story changed how I thought about a topic.
12. I had a vivid mental image of the main character/s in this story.

Notes: Items 2, 5, and 9 are reverse-scored.

Item 12 can be repeated for the number of main characters in the story, substituting a different character name for each item. All use a 7-point scale from “not at all” to “very much”.

Modified from original citation: Green, M.C., & Brock, T.C. (2000). The role of transportation in the persuasiveness of public narratives. *Journal of Personality and Social Psychology*, 79(5), 701-721.

Appendix D

Narrative-Modified Perceived Realism Items

- 1) The dialogue in the narrative is realistic and believable.
- 2) The setting for the narrative just doesn't seem real.
- 3) People in this narrative are like people you or I might actually know.
- 4) The way people really live their everyday lives is not portrayed very accurately in this narrative.
- 5) Events that actually have happened or could happen are discussed in this narrative.
- 6) This narrative shows that people have both good and bad sides.
- 7) I have a hard time believing the people in this narrative are real because the basic situation is so far-fetched.
- 8) This narrative deals with the kind of very difficult choices people in real life have to make.

Notes: Items 2, 4, and 7 are reverse-scored. All use a 7-point scale from “not at all” to “very much”.

Adapted from Elliott et al., 1983; Modified Citation in:

Green, M. C. (2004). Transportation into narrative worlds: The role of prior knowledge and perceived realism. *Discourse Processes*, 38(2), 247-266.

Appendix E

Short form of the Need for Affect Questionnaire (NAQ-S)

1. If I reflect on my past, I see that I tend to be afraid of feeling emotions. (AV)
2. I feel that I need to experience strong emotions regularly. (AP)
3. Emotions help people to get along in life. (AP)
4. I find strong emotions overwhelming and therefore try to avoid them. (AV)
5. I think that it is important to explore my feelings. (AP)
6. I would prefer not to experience either the lows or highs of emotion. (AV)
7. I do not know how to handle my emotions, so I avoid them. (AV)
8. It is important for me to be in touch with my feelings. (AP)
9. It is important for me to know how others are feeling. (AP)
10. Emotions are dangerous – they tend to get me into situations that I would rather avoid. (AV)

Note. Items are presented with a seven-point scale (-3 = strongly disagree to 3 = strongly agree). AP = Approach Subscale, AV = Avoidance Subscale. To build a measure for the Need for Affect, avoidance items must be reverse scored.

Please cite as:

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Appendix F

Need for Cognitive Closure Scale

INSTRUCTIONS: Read each of the following statements and decide how much you agree with each according to your beliefs and experiences.

1. I think that having clear rules and order at work is essential for success.
2. Even after I've made up my mind about something, I am always eager to consider a different opinion.
3. I don't like situations that are uncertain.
4. I dislike questions which could be answered in many different ways.
5. I like to have friends who are unpredictable.
6. I find that a well ordered life with regular hours suits my temperament.
7. I enjoy the uncertainty of going into a new situation without knowing what might happen.
8. When dining out, I like to go to places where I have been before so that I know what to expect.
9. I feel uncomfortable when I don't understand the reason why an event occurred in my life.

10. I feel irritated when one person disagrees with what everyone else in a group believes.
11. I hate to change my plans at the last minute.
12. I would describe myself as indecisive.
13. When I go shopping, I have difficulty deciding exactly what it is I want.
14. When faced with a problem I usually see the one best solution very quickly
15. When I am confused about an important issue, I feel very upset.
16. I tend to put off making important decisions until the last possible moment.
17. I usually make important decisions quickly and confidently.
18. I have never been late for an appointment or work.
19. I think it is fun to change my plans at the last moment.
20. My personal space is usually messy and disorganized.
21. In most social conflicts, I can easily see which side is right and which is wrong.
22. I have never known someone I did not like.
23. I tend to struggle with most decisions.

24. I believe orderliness and organization are among the most important characteristics of a good student.
25. When considering most conflict situations, I can usually see how both sides could be right.
26. I don't like to be with people who are capable of unexpected actions.
27. I prefer to socialize with familiar friends because I know what to expect from them.
28. I think that I would learn best in a class that lacks clearly stated objectives and requirements.
29. When thinking about a problem, I consider as many different opinions on the issue as possible.
30. I don't like to go into a situation without knowing what I can expect from it.
31. I like to know what people are thinking all the time.
32. I dislike it when a person's statement could mean many different things.
33. It's annoying to listen to someone who cannot seem to make up his or her mind.
34. I find that establishing a consistent routine enables me to enjoy life more.
35. I enjoy having a clear and structured mode of life.
36. I prefer interacting with people whose opinions are very different from my own.

37. I like to have a plan for everything and a place for everything.
38. I feel uncomfortable when someone's meaning or intention is unclear to me.
39. I believe that one should never engage in leisure activities.
40. When trying to solve a problem I often see so many possible options that it's confusing.
41. I always see many possible solutions to problems I face.
42. I'd rather know bad news than stay in a state of uncertainty.
43. I feel that there is no such thing as an honest mistake.
44. I do not usually consult many different options before forming my own view.
45. I dislike unpredictable situations.
46. I have never hurt another person's feelings.
47. I dislike the routine aspects of my work (studies).

Scoring the Need for Closure Scale

Items are presented on a six-point scale (1 = strongly disagree to 6 = strongly agree).

1. Reverse-score items 2, 5, 7, 12, 13, 16, 19, 20, 23, 25, 28, 29, 36, 40, 41, and 47.
2. Sum items 18, 22, 39, 43, and 46 to form a lie score.

3. Remove the subject if the lie score is greater than 15.
4. Sum all items except for the above listed lie items to calculate the need for closure score.
5. Use the top and bottom quartiles to determine high and low need for closure subjects.
6. If factors are required, use the following scoring system:

Order: 1, 6, 11, 20, 24, 28, 34, 35, 37, 47

Predictability: 5, 7, 8, 19, 26, 27, 30, 45

Decisiveness: 12, 13, 14, 16, 17, 23, 40

Ambiguity: 3, 9, 15, 21, 31, 32, 33, 38, 42

Closed Mindedness: 2, 4, 10, 25, 29, 36, 41, 44

Reference: Webster, D. M., & Kruglanski, A. W. (1994). Individual differences in need for cognitive closure. *Journal of personality and social psychology*, 67(6), 1049.

Appendix G

Manipulation Check Questions

What do you think the purpose of this study was?

While you were reading, did anything strike you as different from texts you typically read?

Did you notice any inaccurate information in these texts?

-If possible, list any errors you specifically remember. (Only appeared if participant marked that they had noticed inaccurate information.)

Reading Habit Questions

Do you like to read for fun?

About how many hours a week do you read for fun?

How many books do you think you've read in the last year?

If you had to guess, how many books would you say you own?

Please list 5 of your favorite authors and, if possible, the authors of each.

Have you ever re-read a book? Please list the title and author of anything you have read more than once.

How often in the last 6 months have you felt lost in a book? (7-point scale, "never" to "daily".)