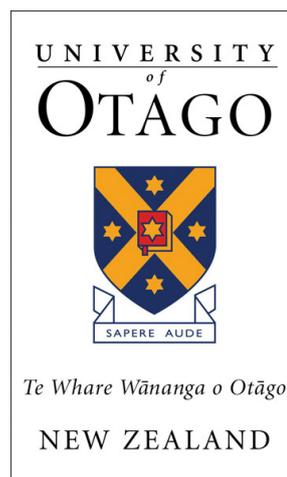


Fiction Reading and Sexism:
Exploring the Effects of Fiction Reading
and Transportation on Sexist Attitudes

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Abstract

It has long been suspected that stories are a powerful method of persuasion. Now, research is emerging that supports these suspicions, that reading fiction can change people's attitudes. Specifically, being immersed in a narrative, also known as being transported, has been proposed as a conditional mechanism for narrative persuasion. Both transportation and narrative are beginning to be examined as tools for attitude change, particularly with the intention of reducing discriminatory beliefs. However, negative attitudes about women have not been examined in this context. The goals of this thesis were two-fold: First, to demonstrate that reading fiction may lead to reduced sexism, and second, to show that this association would be moderated by narrative transportation.

A correlational study (Study 1) was conducted to assess whether long-term readers report lower sexism. Using indirect measures of reading habits, it was demonstrated that people who read more overall showed less benevolent, hostile, and implicit sexism. Individual tendencies to be transported did not predict this relationship. However, as the effects of fiction and non-fiction reading were unable to be disentangled, experimental studies followed to examine whether reading fiction specifically is associated with reduced sexism.

Study 2 examined whether sexism could be altered by reading fiction compared to non-fiction, and whether transportation would moderate this effect. Readers who were more or less transported into the narrative showed a decrease or increase in sexism, respectively, after reading fiction but not after reading non-fiction. However, there were no differences between fiction conditions with different sexism content. This was examined further in Studies 3 and 4. While Study 3 showed no interaction of transportation between different fiction conditions for sexism, Study 4 included a more rigorous test of content effects, and showed that for more transported readers, sexism decreased over a two week period after reading a fictional passage about sexism, but not after reading about racism.

Studies 5 and 6 attempted to manipulate transportation, by increasing the opportunity for mental imagery (Study 5) or by providing pictures with the readings (Study 6). However, neither study was successful in manipulating transportation. In Study 5, mental imagery interacted with measured transportation to increase benevolent sexism scores. Study 6 also showed no effect of imagery on transportation, however, imagery did manipulate the sexist effects of reading about a female character. These results suggested that predicted processes in transportation such as imagery, may actually work independently from transportation.

In a final exploratory study (Study 7), participants had heart rate variability (HRV) measured while reading a fiction passage containing explicit examples of sexism. As transported readers were predicted to experience the narrative as if it were real, then this should be associated with physiological correlates. Although transportation was not directly associated with HRV, transportation interacted with HRV for implicit sexism measures, meaning that less transported readers showed a positive association between HRV and sexism, with no association found for more transported readers. These results suggest that transportation may involve several processes, but also that physiology could be an exciting tool to help examine transportation processes in the future.

In conclusion, this thesis contains original contributions to narrative persuasion literature, by showing that reading fiction is generally associated with lower sexism, and that these effects are often moderated by transportation. This thesis also highlights several implications for Transportation Theory: that the boundary conditions of transportation effects and the components involved must be further explored, and that consistent manipulation of transportation is essential for continued study of narrative persuasion.

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Chapter 1: Introduction

“When I think about how I understand my role as a citizen . . . the most important stuff I’ve learned I think I’ve learned from novels.” – President Barack Obama (2015)

Stories are powerful. Throughout history, people believed novels could change minds, behaviour, even societies. Whether it is challenging certain books as “dangerous” (Ferguson, 2014), or prescribing novels to aid health and education (Kaptein & Lyons, 2009), people seem to understand implicitly that books can change lives.

And these sentiments are not unfounded. One famous example is the novel *Uncle Tom’s Cabin* by Harriet Stowe (1852), credited with starting movements to abolish slavery in the United States (Strange, 2002). Many other novels have also had pervasive cultural impacts, by promoting society-wide discussion on ideas about censorship (*1984* by George Orwell; 1949), war (*Catch 22* by Joseph Heller; 1961), or race (*Beloved* by Toni Morrison; 1987), to name just a few. The ability of fiction to change beliefs and attitudes is referred to as narrative persuasion. Yet only recently has the persuasiveness of fiction reading for attitude change begun to be empirically tested, and challenging discrimination through fiction reading poses an opportunity for this emerging field of research.

There are two aims to the present thesis. The first is to examine the effect of fiction reading on sexist attitudes. Although some previous research has examined narrative persuasion in relation to racism and homophobia, sexism still requires empirical examination. As a pervasive and systemic problem (Becker & Swim, 2011), sexism may or may not respond to cognitive interventions the same way as other forms of prejudice, and little research has examined sexism in the context of fiction reading and attitude change. The second aim of this thesis is to examine one potential boundary condition on the association between reading and attitude change, called *transportation*.

Narrative and Fiction Reading

To begin the discussion of narrative persuasion, we must first define narrative. Unfortunately, no one definition is used by researchers (Mar & Oatley, 2008). For example, narrative may be defined simply as “a sequence of events” (Ryan, 2007, p. 11), yet this misses an important distinction between fictional stories and other types of texts. However, there is some consensus: Narrative must have a beginning, middle and an end (Green & Brock, 2002; Hinyard & Kreuter, 2007); it must be coherent (Hinyard & Kreuter, 2007; Braddock & Dillard, 2016), with causally-related events (Braddock & Dillard, 2016), involving people (or anthropomorphic characters), and conflict (Hinyard & Kreuter, 2007; Braddock & Dillard, 2016). The distinction between “narrative” and “fiction” is unclear (Keen, 2006), and it has been argued that fiction and narrative are distinct concepts (Oatley, 1999).

Some of the confusion around the definition of narrative stems from the fact that non-fiction may also contain narrative elements (Green & Donahue, 2009). For example, Le Marre and Landreville (2009) compared a documentary and a fiction film, both examining issues of Rwandan genocide, and found that emotional reactions to the films were similar. It is likely that the narrative story-telling elements in the documentary were similar to those in the fictional film. That narrative is the driver of effects, rather than fictionalisation per se, has been made clear in studies comparing paratext (meta-information that accompanies a story). Simply labelling texts as fiction or nonfiction does not alter the consequences of narrative (Appel & Malečkar, 2012; Green, Garst, Brock, & Chung, 2006).

Yet, more often than not, descriptions of narrative refer to fiction, rather than non-fiction, passages. While narrative is the cause of narrative persuasion effects, these are much more likely to be found in fiction literature. When comparing fiction and non-fiction, research has demonstrated qualitative differences between the text types, which are likely to reflect the inherent narrative differences. For example, Graesser et al. (1980) found that

participants better recalled fiction stories compared to non-fiction texts, and these effects have been found for both young and older adults (Tun, 1989). Fiction readers also tend to be more socially adept compared to non-fiction readers (Mar, Oatley, Hirsh, dela Paz, & Peterson, 2006), and fiction, but not non-fiction, is associated with increased empathy (Bal & Veltkamp, 2013). Therefore, due to the difficulty in defining narrative, and because fiction (but not non-fiction) is predicted to consistently show narrative persuasion effects, it is fiction that is predicted to lead to attitude change. Subsequently, the terms *narrative* and *fiction* will be used interchangeably throughout this thesis.

Furthermore, in the discussion of fiction effects on beliefs and attitudes, one must also consider other mediums of fiction. Narrative is present in reading, but also in television, videogames, and fine art. Therefore, watching television or films also provides a conduit for narrative persuasion effects (Green et al., 2008; Tukachinsky, 2014). However, whether television or reading is a more suitable vehicle for narrative persuasion remains a contentious issue. Some authors argue that reading is superior to films and other mediums (Green & Brock, 2002), yet more empirical investigation is required, and is outside the scope of this thesis. As a consequence, this thesis is restricted to the examination of *reading*.

Narrative Persuasion

At first glance it would seem that fiction, with its imaginary events and environments, should be less effective at persuasion than non-fiction. Yet, as Oatley (1999) argued, fiction is still “true”, in the sense that fiction contains themes of personal relevance and philosophical coherence. These truths may then contribute to the persuasiveness of fiction.

Green and Brock (2000), as well as other researchers of narrative (i.e., Hinyard & Kreuter, 2007; Escalas, 2007), have argued that narrative persuasion is a distinct method of persuasion, in contrast to persuasion attempts from mediums such as advertising and speeches (called rhetorical persuasion). Dual-processing models of rhetorical persuasion

state that arguments are processed based on their strength (the so-called “central route”) or by other superficial characteristics such as positive affect, attractiveness of the message presentation, or extremity of message (the “peripheral route”; Petty & Cacioppo, 1984). According to dual-processing models, people are more likely to accept counter-attitudinal ideas when cognitive resources are limited (Petty & Cacioppo, 1984; Chaiken & Stangor, 1987). This is supported by research (Gilbert, Tafarodi, & Malone, 1993) that shows participants under time pressure or cognitive load are more likely to believe false information, and to use it when making decisions.

These models are relevant to narrative persuasion, as being immersed in a story decreases attention and cognitive resources (see below), and should therefore also increase the acceptance of counter-attitudinal ideas. However, there are important differences between narrative and dual-processing models of persuasion. Argument strength does not play a role in narrative persuasion. Gnambs et al. (2014) found that argument strength did not influence whether participants were immersed into a narrative. Escalas (2007) too found that argument strength did not influence participants’ evaluations of products when using narrative self-referencing (by imagining themselves using the product), compared to analytical self-referencing (where argument strength did matter). These studies show that when considering the effects of narrative, central routes of rhetorical persuasion do not adequately explain the persuasive effects found.

There is still the possibility that narrative persuasion effects are really peripheral routes of rhetorical persuasion. Yet peripheral routes predicted by dual-processing models are also distinct from narrative persuasion. Based on dual-model theories, these peripherally processed attitudes are temporary and uninformative for behaviour change (Petty, Cacioppo, & Schumann, 1983). Yet, narrative persuasion predicts that attitude change after reading only increases over time (Appel & Richter, 2007; Bal & Veltkamp, 2013), a phenomenon known as *sleeper effects*. For example, Appel and Richter (2007) gave participants a short

story containing true or false information (i.e., “exercise weakens your heart and lungs”). Participants rated their agreement with statements presented in the stories either immediately after reading the story, or in another experimental session approximately two weeks later (as a delayed assessment condition). The authors found that agreement with false information after reading was even greater for participants tested after a two week period, compared to participants tested immediately after reading.

While sleeper effects occur in other models of persuasion, these generally occur after careful evaluation of the information, coupled with a discounting cue (Kumkale & Albaracin, 2004). “Fiction” may be considered to be a type of discounting cue; however, the messages presented in fiction are not predicted to be evaluated as strictly as other message sources (Appel & Richter, 2007), and so the sleeper effects found for narrative do not fit with dual-processing models of persuasion. Thus, the aforementioned studies suggest that narrative persuasion is its own form of powerful persuasion, and not just another example of rhetorical persuasion.

Narrative persuasion for attitude change

When encountering beliefs and attitudes, early philosophers such as Descartes thought that individuals evaluated information, and then effortfully decided upon its validity. In contrast, Gilbert (1991) argued that beliefs are accepted by default, and that effort must be taken to disbelieve them. When considering narrative persuasion, evidence suggests that readers believe what they read by default too (Prentice, Gerrig, & Ballis, 1997; Hoeken & Fikkers, 2014). Early research on narrative persuasion involved examining readers’ beliefs about facts presented in stories. Prentice et al. (1997) showed that university students were more likely to agree with statements regardless of their truth when they were presented in stories. This effect, however, was only found when evaluating stories set at another university. Wheeler et al. (1999) replicated this result over three studies with the exception of setting effects (story-consistent beliefs were high regardless of location).

It is not guaranteed that readers will believe everything that they read, especially if readers know a lot about an issue (Richter, Schroeder, & Wöhrmann, 2009); however, the persuasiveness of fiction appears to be strong, as even warning readers about story falsity does not inhibit learning misinformation (Marsh & Fazio, 2006). What is especially interesting is that readers may not only learn misinformation from stories, but also increase their support for a range of story-consistent topics. A meta-analysis of 74 studies on narrative persuasion (Braddock & Dillard, 2016) showed that across different mediums (text, video, and theatre), and study designs, small but significant effects on a variety of story-consistent beliefs, attitudes, intentions and behaviours were found after reading narratives.

These effects were demonstrated by Hoeken and Fiekkers (2014), who gave university students a story that argued for or against raising college tuition fees. Reading about a protagonist who supports raising the fee led to more positive feelings towards raising the fee. In another study, Bonomi et al. (2014) found that women who read more romantic fiction reported more negative, and fewer positive attitudes towards condom use. Yet after reading erotic stories altered to include condom use, participants reported more positive attitudes towards condoms, and were also (marginally) more likely to report intentions to use condoms in the future, compared to participants who read the passage without the reference to condoms.

Such attitude change has obvious health implications for the readers of such fiction, yet narrative effects extend beyond informing health beliefs. Reading may also change attitudes towards marginalised out-groups. For example, Johnson, Jasper, et al. (2013) showed that reading from a novel about a Muslim woman, reduced participants' anxiety and prejudice towards Arab-Muslim groups, compared to reading the same information in a non-narrative form. The authors suggested that reading provides a safe-haven to explore ideas, a sentiment that has been echoed by other researchers (e.g., Goldstein, 2009). Vezzali and colleagues (2014) used the *Harry Potter* novels by author J. K. Rowling to

examine how reading informs attitudes towards certain out-groups. In their first study, children (approximately aged between 10 and 11 years) were read passages from a Harry Potter novel that related to prejudice (such as one character calling another “mudblood”, a derogatory term), or were unrelated to prejudice (choosing a wand for wizarding school). After reading passages on prejudice, children reported more positive attitudes towards immigrants, compared to the control passage. This result was moderated by identification with the character Harry Potter. In a second study, high school students who had read more of the Harry Potter novels reported more positive attitudes towards homosexuals, and this was also moderated by identification with Harry Potter. In a third study, university students who had read more Harry Potter novels showed lower prejudice towards refugees, however, this was moderated by not identifying with Lord Voldemort, the primary antagonist and oppressive figure in the series. This is possibly due to the fact that Harry Potter is a children’s book and so university students may not find Harry Potter to be an accessible character, yet the villainy of Voldemort is quite apparent.

In an exploratory study, Djikic et al. (2009) hypothesised that reading literary short stories (defined as texts that engage readers actively due to multiple ideas and perspectives; Kidd & Castano, 2013) will result in self-reported changes in personality. University students rated their personality traits before and after reading Chekhov’s *The Lady with the Toy Dog* (1899), or a non-narrative control story. It was not hypothesised prior to the study what traits might be affected by reading, but reading the short story was associated with overall change in the participant’s personality trait profile, and this association was mediated by their emotional reactions to the story.

The above studies provide evidence for the malleability of reader’s beliefs, and so reading presents a possible tool for examining and changing problematic beliefs and attitudes. Yet, one important caveat applies to these findings. Reading on its own does not lead to narrative persuasion. Instead, it appears that readers must “experience” the text, meaning

that readers must become immersed into the narrative, showing cognitive and affective responses to the reading. These experiences (collectively called narrative engagement) have been a part of several theories of narrative-based attitude change, such as Transportation-Imagery Theory (Green & Brock, 2000), Simulation Theory (Oatley, 1999), Identification (Cohen, 2001), and Parasocial Interaction Hypothesis (Schiappa, Gregg, & Hewes, 2005). Transportation is one of the most widely used and investigated factors in narrative persuasion, and has been demonstrated to be a better predictor for the effects on attitude change, compared to other models of narrative engagement (Murphy, Frank, Moran, & Patnoe-Woodley, 2011).

Transportation

“Transportation into a narrative world is conceptualized as a distinct mental process, which may mediate the impact of narratives on beliefs ... [it is] a convergent process, where all of the person’s mental systems and capacities become focussed on the events occurring in the narrative” (Green & Brock, 2002, p. 324).

The term transportation was proposed by Gerrig (1993) to describe immersion into a narrative world, to the extent that reality is temporarily inaccessible. Transportation may be perceptual, as when one is so absorbed in a book that surrounding activity is ignored, or cognitive, as when one accepts parts of narrative that would be viewed sceptically in the real-world, such as the existence of magic. Green and Brock (2002) argued that persuasion occurs in narratives through transportation, and proposed Transportation-Imagery Theory (Green & Brock, 2000), arguing that readers who are transported into narrative worlds are more likely to be influenced by the story content, through processes of imagery, affect, and cognition (Green & Brock, 2002).

To examine transportation, Green and Brock (2000) developed the Transportation Scale,

which has been demonstrated to be valid and reliable (Green, Brock, & Kaufman, 2004). As Transportation-Imagery theory argues for imagery, emotion, and cognition in transportation, so does the Transportation Scale contain items to assess imagery (“while reading the narrative, I could easily picture the events in it taking place”), emotion (“the narrative affected me emotionally”), and cognition (“I found my mind wandering while reading the narrative”). Although these components are included in subscales, the individual subscales do not independently predict outcomes and the scale as a whole is a better predictor of attitudes (Green & Brock, 2000). Other studies of transportation have used adaptations of Green and Brock’s scale (Escalas, 2004; Tal-Or & Cohen, 2010); however, the Transportation Scale remains the most widely used measure of narrative engagement.

Imagery. A reader may imagine plot events, characters, and settings during or after reading a narrative, and transportation is proposed to make this mental imagery more likely to occur (Green et al., 2008). Such imaginings may occur from the use of descriptive language in fiction prose, but also from abstract language and the use of metaphor (Mar & Oatley, 2008).

Mental imagery is proposed to run as a simulated version of the story (Oatley, Green, Strange, & Brock, 2002), a phenomenon which does not occur with non-narratives (Green et al., 2004). These simulations may be related to autobiographical memory (Oatley et al., 2002) and reality (Gerrig, 1993). As mental imagery is considered a weak version of “real” perception, it is predicted to evoke emotions (Holmes, Mathews, Mackintosh, & Dalgleish, 2008) and physiological responses (Pearson, Naselaris, Holmes, & Kosslyn, 2015) as if the situation was real.

Mental imagery and transportation were examined by Escalas (2004) for attitudes and product evaluations after participants viewed print advertising. Participants were given a one-page advertisement with a picture of a running man, accompanied by a text description. The text was manipulated to encourage mental imagery (participants imagined themselves

running through the park in the image) or not. It was found that under mental imagery conditions, argument strength in the advertisements had no effect on attitudes (as might be expected from narrative persuasion theories). What is more, in the mental imagery condition, transportation increased, and this was associated with more positive product evaluations.

Emotional reaction. Emotional responding is an integral part of reading in general; involved before, during, and after reading (Mar, Oatley, Djikic, & Mullin, 2011). Transportation while reading is associated with an increased, and varied, emotional response (Mazzocco, Green, Sasota, & Jones, 2010; Mar et al., 2011), not limited to positively valenced emotions, but also negatively valenced emotions, empathetic emotional responses, and suspense. Emotional responses from narrative engagement may be as broad and varied as those found in the real world.

Consumers of narratives often enjoy negative events and antagonistic characters. Krakowiak and Oliver (2012) found that readers were just as transported into stories with morally ambiguous characters (who perform both good and bad behaviours), as with positive characters. Also, in the research by Green and Brock (2000), a negative story based on true events in which a young girl is murdered, was found to be more transporting than a story with a happy ending. It is not necessarily that readers are ghoulish, but that affective arousal (or altered states), made more accessible by transportation while reading, may be desirable in itself (Green, 2004).

In turn, a transported state may make conflict and character suffering seem more suspenseful (Green, 2004). Suspense is a state of excitement or anxiety over uncertainty (Prieto-Pablos, 1998) that may be evoked by postponing the story outcome (Hoeken & van Vliet, 2000). Yet, as Gerrig (1989) points out, suspense can occur even without uncertainty of the story's outcome. In fact, some readers prefer spoiled stories (Leavitt & Christenfeld, 2011; Rosenbaum, Johnson, & Rosenbaum, 2015). Hoeken and van Vliet (2000) found

that when suspense was manipulated by giving away the ending, or not, participants found the story equally suspenseful. While these results may not be clear in terms of the role of suspense in transportation, it is clear that transportation involves emotional responding in readers. Lehne (2015) showed that suspenseful fiction readings are associated with activation in brain regions associated with perspective taking and social cognition.

Many authors include empathy as an emotional response that reading has on readers. Green et al. (2004) argued that transportation helps develop readers' empathy, yet Transportation Theory does not explicitly predict how empathy processes are related to narrative engagement and persuasion (Tal-Or & Cohen, 2010). This contrasts to competing theories of narrative persuasion (e.g., Identification and Simulation Theories), which include empathy as an essential component of narrative persuasion (Cohen, 2001; Oatley, 1999). These theories may argue that readers identify and empathise with characters, so that they take on their thoughts and ambitions, leading to attitude change.

Johnson et al. (2012) found that transported readers not only reported greater empathy, but also showed more helping behaviour. Participants read a story specially designed to induce empathetic feelings for the characters. Transportation predicted helping behaviour (operationalised as how many pens the participant helped pick up after the experimenter "accidentally" dropped them), partially mediated by empathy. While empathy and transportation are often associated in narrative research, there is evidence that these processes work independently (Argo, Zhu, & Dahl, 2008).

Cognitive reaction. Transportation also involves cognitive elements, namely attention and cognitive load (Green & Brock, 2000). Reading is a cognitively effortful task (Britton, Glynn, Meyer, & Penland, 1982), meaning that reading restricts the amount of other cognitive processing that may occur at the same time (Chang, 2009). As a consequence, limiting cognitive resources may reduce readers' ability to resist persuasion (Gilbert et al., 1993), and attention to other events will decrease when transportation is

high (Bezdek & Gerrig, 2016). Conversely, if attention is directed away from the story, the ability for transportation to facilitate reading effects may be impaired.

Bezdek and Gerrig (2016) examined transportation and attention by comparing highly suspenseful moments to less suspenseful moments in film clips. Suspense was predicted to increase transportation, and attention was measured by reaction times to audio probes that were placed throughout the films. Across several studies, participants were slower to respond, and missed more probes, when they were presented in highly suspenseful moments. Slower reaction times were associated with increased transportation. The authors concluded that these studies supported the assumption that transportation into narratives is immersive to the extent that some attention to reality is lost, possibly to compensate for increased attention to the narrative.

In turn, attention and cognitive load are important as they affect processes such as counterarguing (Nabi & Green, 2014) and resistance to persuasion (Dal Cin, Zanna, & Fong, 2004). Marsh and Fazio (2006) argued that the cognitive effort of reading means less effort is devoted to fact checking. Participants were given short stories that contained correct or misleading information. After reading, participants were given a general knowledge test, containing items that were derived from information in the stories. Readers who received misinformation performed worse on the general knowledge test, even when given warnings about the veracity of the stories, or when instructed to look for errors in the texts. Making the stories more or less difficult to read had no effects on suggestibility. These effects were supported by the second study in Green and Brock (2000), where a task was added after reading, in which participants circled parts of the story that seemed untrue. More transported readers circled fewer parts of the story compared to less transported readers, indicating less counterarguing.

Not all studies have found that transportation decreases counterarguing, however. Moyer-Gusa and Nabi (2010) found that contrary to predictions, counterarguing (as measured by

looking for flaws in the content of television programmes) actually increased with transportation, and had no effect on safe sex intentions after watching a dramatic storyline about teen pregnancy. The authors argued that these results may depend on whether participants had correctly identified the message to be counter-argued in the first place.

In sum, transportation is proposed to use imagery, affect, and cognitive processes, to decrease counterarguing, increase empathy and affect, and produce the experience of being immersed in a narrative, as well as providing a safe place to explore ideas. While there is some ambiguity as to the constructs involved in Transportation Theory, perhaps the more important practical aspects of being transported while reading are the consequences, such as loss of reality, attitude change, and decreased critical thought. Under these conditions, it is proposed that narratives can influence attitudes and beliefs, as well as educate their readers. For example, Murphy et al. (2011) showed that after watching a narrative about cancer on a television show, transportation was the best predictor of attitudes and knowledge about the disease. Previous research, however, has not always consistently supported these predictions.

Transportation and Belief Change

In one of the first studies to investigate the effects of narrative engagement on beliefs, Strange and Leung (1999) examined how readers assign causal judgements to high school dropouts after reading a story. Readers were given a story in which an adolescent boy drops out of high school either due to resource-related problems, such as lack of funding for schools and teachers (the situational condition), or due to emotional problems such as struggling with the work or believing he cannot perform (the dispositional condition). After reading, participants gave reasons for high school dropouts in general. Narrative engagement was found to moderate the effect of condition on causal judgements. For the situational condition, as narrative engagement increased, so did the number of resource-related problems given by readers. For the dispositional condition, as engagement increased, the

number of resource-related problems given by readers for high school dropouts decreased. Thus, being engaged with the narrative increased story-consistent beliefs.

Across two studies Shedlosky-Shoemaker et al. (2014) demonstrated that transportation into a fictional short story can increase the cognitive overlap between the reader and the characters in the story (measured using Venn diagrams). In the first study, participants read a story about a person competing in a race, from a first-person perspective. Transportation predicted cognitive overlap and the motivation to improve oneself (self-expansion), independent of increased liking of or identification with the character. In their second study, the researchers manipulated transportation using pre-reading instructions (more about manipulating transportation in Chapter 5), and also changed the narration to be from a third-person perspective. Transportation again predicted cognitive overlap and self-expansion. However, transportation was not a consistent moderator of self-expansion and cognitive overlap across studies. The authors argued that fiction reading allows for some practice with relationships outside of actual social interactions. In turn, increased cognitive overlap may lead readers to be more accepting of beliefs expressed by characters.

When Green and Brock (2000) developed the Transportation Scale, they also examined the effects of transportation as a mediator between reading and beliefs. Across three studies, it was demonstrated that story-consistent beliefs about the dangerousness of psychiatric patients increased after participants reported being more transported into the story. Beliefs that were less associated with the story (i.e., belief in a just world, or that crime doesn't pay) were not consistently associated with transportation. In a fourth study, participants were given instructions designed to reduce transportation by asking participants to concentrate on writing style and difficulty. Readers in the decreased transportation condition reported fewer story-consistent beliefs, and this was mediated by self-reported transportation.

Transportation was also shown to facilitate belief change via emotion-related mechanism (Appel & Richter, 2010). In their first study, Appel and Richter (2010) compared

two stories to see whether higher transportation would be associated with increased story-consistent beliefs about psychiatric patients (as in Green & Brock, 2000). Story-consistent beliefs were higher for readers who reported being transported into the story about a dangerous psychiatric patient, but not for the control story. The effects of reading on beliefs were also not present for participants who reported lower transportation. In a second study, the emotional content of the stories was manipulated. Participants read one of two stories on organ donation, but in one story the emotional content was higher (the character dies) compared to the other (the character only contemplates death). Transportation was found to moderate the effect of emotion on beliefs; high transportation was associated with more story-consistent beliefs in the high emotion story, compared to the control story. For readers with low transportation, the story with high emotion was associated with fewer story-consistent beliefs compared to the control story. In other words, greater emotional content was associated with increased story-consistent beliefs only if readers were transported into the narrative; furthermore, the effect was stronger if participants had higher need for affect (a tendency to approach emotional situations). This indicates that reading high emotional content per se will not be more persuasive. In fact, more emotional content may actually decrease persuasion if transportation is low.

Green (2004) also demonstrated conditional effects of transportation on beliefs. Participants were given a story about a homosexual man attending a fraternity reunion where no one knows he is gay. Beliefs about the difficulties associated with being a homosexual man, and being a homosexual man in a fraternity, were measured along with beliefs about AIDS protection, male friendship, and fraternity hazing. An instructional manipulation asking participants to relax or to think critically about the story, did not affect transportation, although personal experience with homosexual friends and family, as well as knowledge of fraternities and perceived realism, was positively associated with transportation. Yet even after controlling for subject knowledge and familiarity, people who were more transported reported more story-consistent beliefs.

However, not all studies find consistent facilitative effects of transportation on belief change. Slater et al. (2006) found evidence of narrative persuasion, but only for one of their story conditions. Participants watched one of two television shows that contained themes about either gay marriage or the death penalty. Ideology, identification with the protagonist, transportation, and perceived realism of story were measured, as well as support for the issues profiled in the shows. After watching the shows, there was an overall increase in support for the death penalty, but not for gay marriage. However, attitude change for the death penalty condition was unrelated to transportation. In contrast, transportation partially mediated the association between ideology and story-consistent beliefs only for the story on gay marriage. However, the authors argued that this was a result of individual differences in participants' original attitude towards gay marriage. Some other studies using films (Chung & Slater, 2013) and texts (de Graaf & Hustinx, 2011), have also failed to demonstrate conditional effects of transportation for narrative persuasion, although they provide some evidence for conditions similar to transportation. Chung and Slater (2013) found that perspective taking (but not overall transportation) was associated with increased social acceptance for the main character (a recovering drug addict). De Graaf and Hustinx (2011) manipulated suspense by altering the story structure, and found that transportation was significantly different between stories with different suspense structures. However, the emotion component of transportation did not mediate the association between story structure and beliefs, and the effects of other transportation components (or the entire scale) were not reported.

As is evident in this review, one issue in the transportation literature is whether transportation mediates or moderates the effects of reading on attitude change. While often the terms mediation and moderation are used interchangeably in research, they represent very different causal models, and the distinction has obvious theoretical implications for Transportation Theory. Mediation models use a third variable to explain the association between the independent and dependent variables, to provide evidence for how or why the

relationship occurs. In this model, reading leads to transportation, and transportation leads to attitude change. If transportation is a mediator, then removing transportation will also remove the association between reading and attitude change.

On the other hand, moderation models affect the direction or strength of the predicted relationship. If transportation is a moderator of effects, this means that reading is associated with attitude change; however, certain conditions (such as transportation) are needed for this to occur. Transportation influences the strength of this association, allowing us to see when effects between reading and belief change might emerge.

The mediating role of transportation in narrative attitude change is supported by studies that have manipulated distraction (Zwarun & Hall, 2012), paratext (Appel & Malečkar, 2012), and instruction sets (Green & Brock, 2000); yet in Green and Brock (2000), mediation only appeared for one of their four studies, and in Zwarun and Hall's (2012) research, mediation was not consistent between film types. When mediation was present, the direct effect between distraction and beliefs was in the opposite direction to the indirect effect (via transportation). The authors concluded that this might mean multiple paths between distraction and story beliefs are present.

As another example, Argo et al. (2008) found in separate studies that transportation was both a moderator and a mediator of story enjoyment, in stories with high emotional content. Transportation mediated the relationship between empathy and story enjoyment (study 1), but also moderated the association between distraction and story enjoyment (study 3). The authors interpreted these results as context dependent effects; that in some situations transportation was a mediator, and in others it was a moderator. However, the design of their first study casts doubt on the mediation explanation. In this study empathy was not manipulated or measured but, strangely, operationalised as participant gender (women do tend to report greater empathy than men, but gender is not a direct cause of empathy; Karniol, Gabay, Ochion, & Harari, 1998). This criticism, along with the results of other studies

suggests the possibility that other variables may also explain mediation effects found in research.

In a study more relevant to the present thesis, Richter et al.'s (2013) examined the moderating role of transportation on congruency between character and readers' femininity (defined as having traditional female traits such as being caring and affectionate). Readers were given a story with gender stereotypes (about motherhood and traditional gender roles) or a control story with no reference to gender. Readers who were highly transported reported greater femininity in both stories, but to a greater extent for the gender story. No differences in reported femininity were found for those readers who were not transported.

In summary, although transportation is sometimes treated as a mediator of reading effects, the results have been inconsistent, and are often attributable to other confounding variables. In contrast, the moderation model has been supported by a range of studies examining attitudes and beliefs about femininity (Richter et al., 2013), psychiatric patients (Appel & Richter, 2010), as well as cognitive overlap with narrative characters (Shedlosky-Shoemaker et al., 2014). In these studies, fiction presents an opportunity for attitude change, and transportation allows readers to take better advantage of it. This moderation model is not only perhaps more intuitive, but has also received more evidence from previous literature (as described above). Transportation is then predicted throughout this thesis to be a moderator of narrative persuasion effects, for negative attitudes about women.

Summary and Overview of Thesis

In conclusion, engaging with fiction has been shown to change beliefs, attitudes, and behaviours in several domains. The goal of the current thesis is to extend this work to sexist beliefs (particularly for ambivalent sexism, described in Chapter 2), and to explore the conditions of narrative effects. To examine the association between reading and sexism, chronic reading habits are an intuitive place to start. Thus, the first study in this thesis (Chapter 3) presents correlational data on participants' reading, ambivalent sex-

ism, and tendency to be transported (transportability). Chapter 4 presents experimental research in which participants are presented with fiction passages, and their hostile and benevolent sexism measured. This research involved comparing reading fiction to reading non-fiction (Study 2), reading gendered versus control content (Study 3), and comparing sexist and racist content to examine the content-specific effects on relevant measures (Study 4). In each study, the degree to which readers report transportation is tested as a moderator of reading effects. In Chapter 5, experimental manipulations of transportation are presented, including mental imagery training (Study 5), and pairing text with associated images (Study 6). Chapter 6 further examines transportation with physiological data of heart rate variability while reading a chapter from a novel (Study 7), to assess whether cardiovascular change while reading are associated with transportation and belief change.

Chapter 2: Narrative Persuasion and Sexism

Previous studies have demonstrated a variety of effects of fiction reading, including personality judgement (Djikic et al., 2009), attitudes (Vezzali et al., 2014), and the acceptance of false information (Appel & Richter, 2007). Some researchers have attempted to apply narrative persuasion to more socially desirable ends, focussing on discriminatory belief change, and particularly on racism (Johnson, Jasper, Griffin, & Huffman, 2013) and homophobia (Green, 2004). The purpose of this thesis is to explore the effect of narrative persuasion on sexist attitudes.

With the possible exception of Richter et al. (2013; described in Chapter 1), no research has addressed the effects of narrative persuasion in sexism in adults. Furthermore, research on other forms of discrimination cannot necessarily be extrapolated to sexism, which some consider a “qualitatively different” (Paluck, 2009, p. 342) form of prejudice, for several reasons. First, it is unclear whether the motivations that underlie sexism, and sexism reduction, are the same as those for racism and other forms of discrimination (Swim, Aikin, Hall, & Hunter, 1995; Nicol & Rounding, 2013). Second, interpersonal relationships and interactions are much more common between gender groups (Glick & Fiske, 1996), compared to other forms of intergroup contact, in which out-group exposure might help reduce discrimination (Pettigrew & Tropp, 2008). This has important implications as such high interpersonal interaction leads to prejudice being expressed in less hostile and overt ways (Glick & Fiske, 2011). These “positive” prejudices can be harmful too as they are not perceived as negative. For sexism this is referred to as *benevolent sexism*, which may be widely endorsed by both men and women (Eagly & Mladinic, 1994).

Sexism

People hold strong beliefs about the roles that men and women have in society. Traditionally, women have not pursued careers (Rudman & Kilianski, 2000), while men have

been the breadwinners, with careers and power (Fiske, Cuddy, Glick, & Xu, 2002). These traditional roles are usually supported in society, where individuals conforming to these group expectancies are positively evaluated (Eagly & Karau, 2002). Men and women who deviate from these social roles may suffer backlash and penalization, including negative evaluation and targeted degradation (Heilman, 2001). For women, non-traditional groups include feminists, lesbians, career women, and “temptresses” (Glick & Fiske, 1996).

Traditional gender roles often coincide with beliefs and stereotypes about women (Swim et al., 1995). Gender stereotypes represent how men and women are, or ought to be (Eagly & Karau, 2002). For men these include traits such as agency (the ability to do things and exert power; Conway & Vartanian, 2000) and high status. For women, desired traits include communality (having good interpersonal skills such as being warm, nurturing, and friendly; Rudman & Glick, 2001) and low status. In contrast, *proscriptive* stereotypes state how men and women *should not* be. For example, women should not be dominating, while men should not be submissive (Rudman, Moss-Racusin, Phelan, & Nauts, 2012). Sexism may be defined as endorsement of traditional gender roles or stereotypes, and/or biased perceptions of gender differences. Most of the examples of sexism are hostile and overt. However, more covert sexism (or sexism that appears positive) is also harmful to women (Glick & Fiske, 2011).

Ambivalent Sexism

Ambivalent Sexism Theory proposes that there are two types of sexism; benevolent and hostile (Glick & Fiske, 1997). Hostile sexism is the more salient and overt form. Hostile sexism stems from perceptions that women are threatening to men’s power, either directly (e.g., by “falsely” claiming unfair treatment due to gender) or indirectly (e.g., via sex and manipulation). Benevolent sexism, in contrast, is a type of “positive” prejudice, where women are perceived as wonderful but delicate people who need to be protected and cared for (Glick & Fiske, 1997). Benevolent sexism includes beliefs that men should protect and

care for women, that women have special qualities that men don't have, and that women fulfil men's romantic needs (Becker & Wright, 2011). Over time hostile sexism, which contains the more overt negative attitudes towards women, has become less appropriate and sexism has become more covert and ambivalent (Glick & Fiske, 2011).

Ambivalent Sexism Theory (Glick & Fiske, 1997) further proposes that both hostile and benevolent sexism work to maintain the status quo and to justify the greater status of men (Sibley, Wilson, & Duckitt, 2007), although the two constructs may predict different behaviours. Men may be threatened by loss of power, whereas lower status groups (i.e., women) may believe that the stereotypes are justified by the perceived benefits that accompany the disadvantages (Fiske et al., 2002). For example, sexism may be justified as a trade-off between women's perceived weakness and the requirement that they be protected by men.

Hostile sexism, such as overt hostility towards women, encompasses the more familiar description of sexism. Non-traditional women tend to attract hostile forms of sexism (Becker, 2010), and in particular may suffer severe consequences for rejecting gender norms. Hostile sexism may then predict certain behaviours, such as harassment, or reactions to harassment. For example, Saunders et al. (2016) found that men reporting higher hostile sexism were more likely to agree that women should cope with harassment by letting it go, or considering it flattering, and thought that women should blame themselves for the harassment behaviour. In another study, men who suffered threat to their male identity may be more likely to sexually harass a non-traditional woman (i.e., a feminist; Maass, Cadinu, Guarnieri, & Grasselli, 2003).

In another study, Glick et al. (2015) recruited men to complete questionnaires about attitudes towards traditional and non-traditional gender types, such as feminist men and women, or stay-at-home mothers and fathers. Masculine identification was positively correlated with both hostile and benevolent sexism, and men evaluated non-traditional sub-

types of men and women more negatively when they scored higher on hostile sexism. Benevolent sexism, however, was only associated with more positive evaluations of traditional women, suggesting that benevolent sexism targets women exclusively.

These perceptions of traditional and non-traditional groups were supported by Becker (2010), who assessed women on ambivalent sexism measures. After completing the Ambivalent Sexism Inventory (ASI), Becker asked participants who they thought of when answering the questions. Aside from thinking about “women in general”, female participants thought more about non-traditional, compare to traditional, women while completing the hostile measure. This was also associated with greater endorsement of hostile sexism beliefs. For benevolent sexism, most women considered “women in general” (to a greater extent than for the hostile sexism scale); however, the second most common subtype was a housewife, and the more women thought of this subtype, the more they endorsed benevolent sexism.

Traditional women are more likely to attract benevolent sexism (Becker, 2010), but while benevolent sexism may appear positive (Barreto & Ellemers, 2005), it has negative implications. Men and women who are comfortable with benevolent sexism are more likely to defend and legitimise hostile sexism (Becker, 2010; Sibley et al., 2007). In addition, benevolent sexism also helps to maintain gender inequality. For example, Hammond and Sibley (2011) found that for both men and women, benevolent sexism was linked to higher life satisfaction, a problem as this indicates that both men and women feel comfortable with benevolent sexism. For men, supporting benevolent sexism meant feeling less guilt for higher status, as well as less threat to status from women. For women, benevolent sexism justified the status discrepancy between the genders, and so indirectly increased life satisfaction.

Benevolent sexism also has negative effects beyond reinforcing the status quo. Exposing people to benevolent sexism increased perceptions of gender stereotypes and gender

differences (Zell, Strickhouser, Lane, & Teeter, 2016). This may result in negative evaluations of women's competence. Indeed, benevolent sexism has been linked to reduced perceptions, by both genders, of competence in women (Becker & Wright, 2011). This includes perceptions of women's own competence (Barreto, Ellemers, Piebinga, & Moya, 2009; Dardenne, Dumont, & Bollier, 2007). Barreto et al. (2009) exposed women to hostile and benevolent sexist beliefs. Participants rated their agreement with the beliefs, as well as their self-descriptions of task-relevant and socially-relevant abilities. Participants agreed more with the benevolent comments, compared to hostile comments, but after being exposed to benevolent sexism participants were less likely to describe themselves in task-related terms, compared to when they were exposed to hostile sexism. Dardenne et al. (2007) extended these findings by showing that women exposed to benevolent sexism actually performed worse on problem solving tasks, and this was mediated by perceptions of sexism (such that participants evaluated benevolent sexism as less sexist). These results were replicated by Dumont et al. (2008), who found that in a pseudo job interview, women exposed to benevolent sexism performed slower and less accurately on tasks of reading span. These women also recalled more memories of being incompetent in general, compared to participants in the neutral or hostile sexism conditions.

Even so, it may be difficult for women to reject benevolent sexism. Moya et al. (2007) showed that women with greater benevolent sexism were more likely to accept restrictions placed upon them (e.g., for driving a car, or engaging in physically risky job opportunities), and to react positively to such restrictions, even if the justifications provided for restrictions are explicitly sexist. Becker and Wright (2011) showed that when exposed to benevolent sexism, women were less likely to intend to take, and to actually take, collective action against sexism, whereas hostile sexism increased both intention and action. The authors argued that the effects were mediated by gender-specific system justification, and the perceived advantages of being a woman.

Interestingly, there is an illusion that hostile and benevolent sexism are opposite concepts, as documented by Rudman and Fetterolf (2014). Participants rated hostile and benevolent sexism both from their own perspective, and from the perspective of the opposite gender. Women overestimated men's hostile sexism and underestimated benevolent sexism, with the opposite effects were found for male participants. Benevolent sexism was also perceived as a positive measure for evaluating women. This is supported by research that shows benevolent sexism may increase as a defensive reaction against overt forms of sexism (Fischer, 2006). Fischer (2006) instructed female participants that previous research had found men's attitudes towards women were either negative, positive, or neutral. Afterwards, participants rated their own ambivalent sexism levels. No differences were seen between conditions for hostile sexism; however, benevolent sexism was significantly higher for women who were told that men's attitudes towards women were negative. This appears to show a mismatch in the understanding of sexism, and actual benevolent sexism.

Sexism as a Unique Prejudice

Sexism and racism have often been compared in the literature on prejudice, yet sexism deserves examination separately. Not all prejudices are created equal, and the distinction between the two forms of prejudice has been documented. For example, some research suggests sexism differs in perceived severity to other types of prejudice. Czopp and Monteith (2003) instructed participants to imagine a hypothetical scenario in which they made subtly biased comments and were confronted about them. Participants reported responding to this confrontation with more discomfort and guilt if the bias was racial, but were more amused if the bias was gender-based (Czopp & Monteith, 2003). Discounting sexist remarks as humorous also leads to such comments being perceived as less sexist (Mallett, Ford, & Woodzicka, 2016). This has important implications for prejudice reduction as it suggests that sexism is less likely to be successfully reduced by confrontation, perhaps making narrative persuasion a more appropriate tool for attitude change in this domain.

Other research has suggested different underlying motivations for different types of prejudice. Nicol and Rounding (2013) assessed participants' social dominance orientation, empathy, sexism and racism, and found that empathy mediated social dominance orientation effects on sexism, but not on racism. Swim et al. (1995) conducted research to assess whether sexism and racism are motivated by the same underlying beliefs, by comparing "old-fashioned" and "modern" measures for both racism and sexism. It was predicted that differences between the two types of prejudice would be observed, as racism would be considered less appropriate by participants on both old-fashioned and modern measures, compared to sexism. Indeed, little distinction was found between old-fashioned and modern racism. However, a significant distinction was observed between measures of old-fashioned and modern sexism, such that men and women report similar scores for modern sexism, whereas men reported higher old-fashioned sexism compared to women.

Perhaps the best comparison to sexism is homophobia. Sexism and homophobia appear to stem from the same motivational processes, as both come from patriarchal beliefs (Capezza, 2007). Because of this, homosexuals and non-traditional women may both be threatening to (heterosexual) male status. Studies have shown significant associations between the two measures (Black, Oles, & Moore, 1998; Stevenson & Medler, 1995). Yet Capezza (2007) argued that although homophobia and sexism are related, they differ on the grounds of benevolent stereotypes that are present for women, but not homosexual men.

The differences between sexism and homophobia also are apparent when considering gender differences in reactions to the two constructs. While both men and women endorse benevolent sexism, women and men may respond differently to homosexuality. Adams et al. (2016) found that while models of sexism, homosexuality, and related constructs (i.e., religious fundamentalism and right-wing authoritarianism), were generally the same between men and women, only women's data showed a correlation between benevolent sexism and homophobia, and only men's showed a correlations between physical aggres-

sion and homophobia. In a similar study, Nagoshi et al. (2008) found that homophobia and transphobia were related to perceptions of traditional gender roles for men and women; however, only for women did benevolent sexism predict homophobia and transphobia.

It is not just gender differences that differentially predict homophobia and sexism. Hill et al. (2010) found differences in models for the effects of religious fundamentalism on sexism and homophobia; Need for Cognition predicted effects of fundamentalism on homophobia and benevolent sexism, but not for effects of fundamentalism on hostile sexism. The point is that while homophobia has been shown to be sensitive to narrative persuasion (Green, 2004), and homophobia and sexism are based on similar belief systems, there are still empirical differences that prevent generalization to sexism without further research.

Sexism is also unique due to the high level of interdependence between men and women (Glick & Fiske, 1996; Nicol & Rounding, 2013), compared to other forms of prejudice where in-group/out-group interaction is low. Glick and Fiske (2011) argued that such interdependence between groups would result in less hostile forms of prejudice; these more covert or benevolent prejudices, however, still reinforce the status quo. In the case of benevolent sexism, both men and women believe that women are wonderful and morally superior, but also weaker than, men (Eagly & Mladinic, 1994).

In sum, sexism is a unique form of prejudice, due to high levels of interaction and interdependence between men and women, the “positive” aspects of sexism, perceived lesser severity of sexism, as well as the potential motivational differences between sexism and other prejudices. Because of this, the effects of narratives on discriminatory attitudes may not automatically extend to sexism, and sexism still requires examination in the narrative persuasion context.

Challenging Sexism with Reading

Most of the research examining gender attitudes and sexism in the context of reading has sampled children. It has long been argued that what children read affects them (Tibbetts, 1978), and recent research suggests that what children read also impacts their attitudes towards gender-roles. For example, presenting non-traditional occupational roles of men and women in a story has been shown to reduce children's stereotypical attitudes towards sex-roles (Scott, 1986). In other research, providing more egalitarian role models also reduced sex-stereotyping in children (Flerx, Fidler, & Rogers, 1976), whereas giving children sex-role stereotypes increased stereotype behaviour in young girls (Knell & Winer, 1979).

Yet much less research has examined reading and sexism in adult populations, and it is important to examine adults' attitudes too. Ironically, there has been increased interest in the effect of reading on adult sexism following publication of the *Fifty Shades of Grey* trilogy by E. L. James, which describes consensually-ambiguous, sexually dominant behaviour towards women. In fact, analysis of the series indicates patterns consistent with intimate partner violence between the two main characters (Bonomi, Altenburger, & Walton, 2013). Altenburger et al. (2016) surveyed female university students, and women who read at least the first *Fifty Shades* novel reported higher levels of benevolent and hostile sexism, especially if they rated the novels as romantic. Other erotic stories have been examined for the use of sexual dominance behaviour. Harris et al. (2016) recruited heterosexual participants to read stories that contained erotic consensual dominance, or no dominance. While hostile sexism showed no effect of condition, women reported significantly higher benevolent sexism after reading a story with a sexually dominating man, and rated male dominance as more valuable. However, when presented with a dominating woman, both men and women rated preference for dominance equally. This indicated that after reading about counter-stereotypical gender behaviour, women were less concerned about the value

of stereotypical male dominance.

Little research outside of romance fiction exists for narrative persuasion and attitudes towards women. Some research on film has shown the men may hold greater rape myth acceptance after watching films that portray violence against women (Malamuth & Check, 1981). However, to the author's knowledge, there is no experimental research that examines whether written narratives can influence adults' sexism beliefs.

In conclusion, little research exists on narrative persuasion for sexist beliefs, and therefore, it is unknown whether the findings from previous studies on narrative persuasion will generalise to sexism. Examination of sexism is particularly warranted, as sexism is considered to be a unique form of prejudice, due to potentially different motivations for sexism (compared to other forms of prejudice), high interdependence and interaction between groups, as well as contemporary, "positive" sexist beliefs. The goals of this thesis are to test for narrative persuasion effects on sexism, and to assess transportation as a necessary condition for these effects.

Chapter 3: Long-Term Reading in Adults

To begin exploring the effects of reading on sexism, one may first examine individual differences. Some consequences of long-term reading seem intuitive. It makes sense that reading might help a person's vocabulary, reading skills, or general knowledge, simply by practice with and exposure to the language. Indeed, Mol and Bus (2011) showed through meta-analyses of studies with different age groups, that greater print exposure over a person's lifetime had beneficial effects for technical reading, vocabulary, and comprehension skills. Exposure to both fiction and non-fiction (but not to television) also predicts individual differences in general knowledge, even more strongly than cognitive and reading comprehension tests (Stanovich & Cunningham, 1992).

Reading is more than exposure to words and facts, however. As argued in Chapter 1, readers also experience narrative settings, events and perspectives, which are predicted to enhance their social abilities, and change their attitudes. Although these links have only recently been studied, initial results suggest that individuals who read more fiction long-term demonstrate superior social skills, including empathy and theory of mind (Mar et al., 2006; Mar, Oatley, & Peterson, 2009; Fong, Mullin, & Mar, 2013). Mar and colleagues (2006) demonstrated that, in contrast to the "awkward bookworm" stereotype, fiction readers are actually better at reading social cues. Introductory psychology students were given the Author Recognition Task (ART) as an indirect measure of reading habits. In the ART, which was developed using the logic of signal detection theory (West, Stanovich, & Mitchell, 1993), participants are asked to select authors that they recognise from lists of real and fake names, a method that discourages guessing and distinguishes accuracy from bias. Mar and colleagues found that better performance on the fiction component of the ART was positively associated with the ability to recognise people's mental states, and with empathy towards fictional characters. In comparison, non-fiction reading negatively predicted these social abilities. The association between fiction reading, theory of mind, and

empathy for fictional characters was then replicated by Mar et al. (2009), controlling for personality traits such as openness to experience, another trait associated with exposure to fiction reading (McManus & Furnham, 2006).

More recently, Fong et al. (2015) extended the results of long-term reading effects from social skills to prosocial attitudes. The authors showed that reading was positively correlated with gender-based egalitarian attitudes, including measures of sexual conservatism and sex roles. Participants were undergraduate students, who were given the ART to measure reading habits. A significant association was found between fiction reading and measures of sex attitudes and sex roles, but there were several caveats. Most notably, when the ART was separated by genres of fiction, only domestic fiction predicted any of the measures (gender role stereotyping). Additionally, the measures used to assess sexism (the Traditional Egalitarian Sex Role Scale, and subscales from the Sexual Attitudes Survey) include explicit and dated items (e.g., “I would not allow my son to play with dolls”) that are likely vulnerable to socially-desirably responding. The measures also exclude “modern” forms of bias, such as benevolent sexism (Glick & Fiske, 1996) and implicit sexism (Ramos et al., 2015). Furthermore, Fong et al. (2015) could only speculate as to why reading and sexism were related; only suggesting that perspective-taking could be involved.

As argued in Chapter 1, transportation has been proposed to be a necessary condition for narrative persuasion, and trait transportation may also be associated with long-term reading effects. As readers cannot be expected to accurately remember how often they are transported over multiple readings, the tendency to be transported (transportability) may provide a helpful proxy for examining long-term reading effects.

Transportability has primarily been considered an antecedent to transportation (van Laer, de Ruyter, Visconti, & Wetzels, 2014). Bilandzic and Busselle (2008) investigated transportability as a predictor of film viewers’ transportation. Transportability was measured a week prior to watching films from three different genres (romantic comedy, crime

thriller, and science fiction). After film viewing, participants rated their transportation and agreement with a series of measures designed to assess genre-consistent attitudes (e.g., “anyone can find true love” for the romantic comedy genre). Transportability was assumed to be an indicator of repeated transportation experiences, and transportability before film watching predicted transportation scores after watching the film. The authors also found that high transportability predicted genre-consistent attitudes. These results were supported by Dal Cin et al. (2004), who argued that transportability moderates transportation’s effects on narrative persuasion. Participants read short stories or watched scenes from a film, and reported attitudes on story-consistent measures (i.e., mental health or workers’ union rights), both before and after narrative consumption. Transportability predicted the level of transportation the readers and viewers experienced, with higher transportability associated with higher transportation. In turn, higher transportation scores lead to higher ratings of story-consistent attitudes after reading, even when controlling for initial beliefs.

As transportability is related to transportation, transportability itself may be a useful measure to help predict reductions in discriminatory attitudes. Mazzocco et al. (2010) gave participants a story about a person who reveals they are gay, and after reading, participants rated attitudes towards homosexuals. Higher transportability was associated with more pro-gay attitudes, yet this was mediated by acute transportation.

The above studies suggest that chronic transportation might be used to examine long-term reading effects on attitudes — including sexism. However, one should also consider the way in which attitudes are measured. Explicit measures, typically self-reports, tell us about attitudes after “validation processes” (Gawronski, LeBel, & Peters, 2007); that is, they are deliberate judgements based on what the person making the judgement perceives to be true (Gawronski & Bodenhausen, 2006). Research into narrative persuasion has tended to focus almost exclusively on explicit attitudes, yet implicit attitudes may also be informative for fiction’s effects. While explicit measures are important for evaluating

attitudes and attitude change, participants may be consciously unaware of their own attitudes, or social desirability may bias participants to respond in a certain way (Greenwald, Poehlman, Uhlmann, & Banaji, 2009). Implicit attitudes are less susceptible to such biases, and can tell us about conceptual networks that may be present before they are evaluated for explicit judgement (Hofmann, Gawronski, Gschwendner, Le, & Schmitt, 2005). Researchers have previously argued that attitude change after reading should also occur at an implicit level as emotions felt while reading (especially if the reader is highly transported) should become associated with the story concepts (Dal Cin et al., 2004). Therefore, implicit techniques may provide a useful complement to examining the effects of narrative on traditional attitude measures. If reading indeed helps integrate concepts into associative networks (suggesting long-term attitude change) then long-term readers should show lower implicit attitudes as well.

Implicit attitudes may be assessed by a range of tasks, but by far the most well-known and frequently used is the implicit association test (IAT; Greenwald, Mcghee, & Schwartz, 1998). In the standard IAT, participants are given single words or pictures representing attributes, and must categorise them with a pair of target categories. Response times are measured, and used to infer cognitive associations between the concepts. For example, in Foroni and Mayr's (2005) study, names of flowers and insects (the targets) were paired with positive and negative words (the attributes). In "congruent" blocks of trials, participants categorised flowers and positive words using the same response key, and insects and negative words on a difference response key. In incongruent trials, targets were paired with the opposite category (i.e., flowers and insects with negative and positive words, respectively). Comparing times between congruent and incongruent trials provides a measure of the relative strength of association between concepts. For the "flower/insect" IAT, faster responses on congruent trials (compared to the incongruent trials) are interpreted as an implicit preference for flowers compared to insects.

According to some theories, while explicit attitudes can change, implicit attitudes remain stable (Cunningham, Preacher, & Banaji, 2001; Greenwald et al., 2002). Yet, recent research suggests that implicit attitudes may be more malleable, and stereotype representations more contextual, than previous thought. Counter-stereotypical examples are less likely to be activated when assessing implicit associations; however, they can be activated (Blair, Ma, & Lenton, 2001). In fact, Foroni and Mayr's (2005) "flower/insect" IAT was followed by an attempt to manipulate implicit attitudes by giving counter-stereotypical examples that switched the categories' evaluations. Participants were told to imagine that flowers have become radioactive and dangerous, and insects were now a valuable food source. After reading the counter-stereotypical scenario, participants were quicker to respond in "incongruent" blocks (flower/bad or insect/good), compared to when they had not received the manipulation. These results are important as they show that automatic associations as measured by implicit tests can be changed.

It is important to note that this effect was not likely due to strategic responding, as when Foroni and Mayr motivated participants to cheat, they could not easily manipulate their IAT results. Notably, in another condition, simply exposing participants to the counter-stereotypic examples was not sufficient to alter response times; participants required the examples to be presented as part of a conceptual network, such as in a coherent narrative. These results are supported by studies that have tested implicit associations after reading fiction, indicating that stories may provide a framework to present new concepts in a coherent manner (Busselle & Bilandzic, 2009).

As an example of fiction effects on implicit attitudes, Gabriel and Young (2011) used an IAT to examine readers' assimilation with characters after reading passages from a novel. Participants read chapters from novels introducing fantasy characters, such as vampires or wizards. Participants were then given an IAT to test the association between self-concepts (represented by words like 'me' and 'my') and the type of fantasy character they had read.

After reading the fiction passages, participants were more likely to associate themselves with wizards and vampires if they read the wizard and vampire passages respectively, especially for participants who reported that group membership in general was important for their identity.

Johnson, Jasper, et al. (2013) extended these results by measuring implicit attitudes towards Arab-Muslim targets after reading a fictional passage containing counter-stereotypic examples. An IAT was used to compare the associations of Arab and Caucasian names with positive and negative adjectives. After reading a narrative designed for the study, the implicit negative association for Arab-Muslim targets was significantly lower (and empathy significantly higher) compared to reading a condensed or non-narrative passage, even though the controls still contained the same counter-stereotypic examples. However, this effect occurred only for participants low in dispositional perspective taking (the chronic tendency to engage in perspective-taking; Davis, 1983). The authors argued that people low on this trait will experience more anxiety at the thought of meeting an outgroup member, because they are less likely to have practiced intergroup contact. Reading was proposed to allow for practice at such social interaction, and thereby to reduce anxiety and implicit prejudice.

The research described above supports the idea that reading fiction may provide a valuable tool for attitude change. Little research has examined the effect of long-term reading beyond social skills such as empathy. In addition, in the one more relevant study (Fong et al., 2015), boundary conditions for the relationship between long-term reading and attitude change was not investigated.

Study 1 was therefore conducted to study the correlational relationship between reading habits and sexism, and the potential moderating role of chronic transportability (as a proxy for the likelihood that a reader is transported while engaging with a text). It was predicted that exposure to and experience with fiction would be associated with lower sexism scores,

particularly for people who are easily transported.

Study 1

Method

Participants

Participants were 74 first and second year undergraduate University of Otago Psychology students, who were given course credit after completing a short post-experiment questionnaire. There were 54 female and 20 male students, aged between 18 and 28 years. To be consistent with previous studies in the narrative persuasion literature (e.g., Green & Brock, 2000), I aimed to recruit at least 50 participants per between-subjects cell in this and subsequently reported studies, in this thesis.

Materials

Reading habits were measured using the Author Recognition Test (ART; Stanovich & Cunningham, 1993; Mar et al., 2006). The ART includes 140 names of authors: 50 fiction authors, 50 non-fiction authors, and 40 fake names (i.e., Gary Beauchamp; see Appendix A). Participants indicate which names they recognise as real authors, and guessing is discouraged. The ART is a valid scale for assessing reading habits that predicts actual reading behaviours, such as the likelihood of reading while waiting in an airport (West et al., 1993). The version used in the present study was adapted by Mar and colleagues to ensure strict categorisation of fiction (narrative) and non-fiction (non-narrative) authors, who could be separated into five categories (each with ten author names): romance (e.g., Danielle Steele), foreign (Gabriel Garcia Marquez), science fiction (Arthur C. Clark), suspense (John Le Carré), and domestic fiction (Alice Munro). There was also a non-fiction component including science (Stephen Hawking), self-help (Philip C McGraw), social commentary (Noam Chomsky), psychology (Oliver Sacks), and business literature (Faith Popcorn). An overall ART score was calculated by counting the number

of recognised authors and subtracting by the number of foils also selected.

Transportability was measured using the Transportability Scale (Dal Cin et al., 2004), a personality trait measure that examines the tendency for a person to be immersed in the text they are reading. It contains 20 items such as “when reading for pleasure: I find myself feeling what the characters might feel”. Participants rate their agreement of a 9-point scale from 1 (strongly disagree) to 9 (strongly agree). The transportability scale is distinct from measures of transportation as it measures the general tendency to be transported when reading, rather than readers’ transportation after reading a specific text (Dal Cin et al., 2004). The transportability scale is calculated by reverse coding appropriate items, and then averaging across all items within the scale (see Appendix B).

Explicit sexist attitudes were measured on the Ambivalent Sexism Inventory (ASI; Glick & Fiske, 1996, see Chapter 2 and Appendix C), a 22-item scale that assesses both “hostile” and “benevolent” sexism, on a 6-point scale from 0 (strongly disagree) to 5 (strongly agree). The hostile subscale contains statements such as “Women are too easily offended” and measures hostility towards women who may threaten male power (Glick & Fiske, 1997). The benevolent sexism subscale contains statements such as “Women should be cherished and protected by men” and measures “positive” prejudice towards women (Glick & Fiske, 1997). The hostile and benevolent subscales contain components of paternalism (dominant and protective), gender differentiation (competitive and complementary), and heterosexuality (hostility and intimacy), although these components are not separately analysed. The ASI correlates well with measures of Neosexism (Masser & Abrams, 1999), the Attitudes Towards Women Scale, and the Modern Sexism Scale (Swim, Mallett, Russo-Devosa, & Stangor, 2005), albeit most of these scales correlate with the hostile sexism subscale of the ASI, suggesting that the benevolent subscale is a unique measure of “positive prejudice” for perceptions of women (Masser & Abrams, 1999). Hostile and benevolent sexism subscales were calculated by averaging across the subscale items after appropriate

reverse scoring.

Implicit sexist attitudes were measured via two Implicit Association Tests (IATs), programmed with SuperLab stimulus presentation software for Macintosh. As described above, the IAT pairs attribute and target categories and measures the time taken for participants to sort words into these categories. The two IATs were developed for this study to measure different aspects of female gender stereotypes. The first (moral-IAT) compared moral and immoral attributes, and was designed to tap into benevolent stereotypes, specifically the perception that women are more moral, refined, and pure than men (Glick & Fiske, 1997). The second (strong-IAT) compared gender stereotypes for male and female targets (i.e., strong for men and good for women). Only positively valenced attributes were used, to avoid potential valence confounds that may bias results due to positive/negative associations rather than category associations (Schnabel, Asendorpf, & Greenwald, 2008). While IATs typically use incompatible attribute categories (and the “good” and “strong” categories in the present IAT are not mutually exclusive), these attributes are predicted to be relatively polarised in terms of gender stereotyping. Ambivalent sexism is characterised by complementary perceptions; i.e., that women are “wonderful but weak” (Eagly & Mladinic, 1994), or that men are “bad but bold” (Glick et al., 2004). Therefore, comparisons between these attributes for male and female targets are predicted to activate relevant gender concepts.

Table 3.1 contains the lists of words used in each category of attributes and targets. Stimuli were developed using synonyms or related concepts from previous studies on ambivalent sexism, that reflected aspects of benevolent sexism (i.e., “moral”; Glick & Fiske, 1997).

Additional Measures. Demographics measures included the participants’ age and gender, plus participants’ reading habits: the number of books they read per year, the frequency that they read for pleasure, and their preferred book genre (see Appendix D).

Table 3.1

Target and Attribute Words for the Implicit Association Tasks

Target		IAT-Strong Attributes		IAT-Moral Attributes	
Male	Female	Strong	Good	Moral	Immoral
Man	Woman	Stoic	Pure	Pure	Fake
Boy/Him	Girl/Her	Tough	Kind	Moral	Sinful
Male	Female	Strong	Good	Chaste	Corrupt
Masculine	Feminine	Powerful	Cherished	Refined	Immoral
		Protective	Wholesome	Wholesome	Dishonest

Note: For the IAT-Moral, ‘Him’ and ‘Her’ replaced ‘Boy’ and ‘Girl’ respectively, for target words.

Need for Cognition was also included as a measure in Study 1 for exploratory purposes, as it has been used in previous studies of narrative, and may be associated with media preference and transportation (Green et al., 2008; Zwarun & Hall, 2012). Need for cognition was measured with the Need for Cognition scale (NCS; Cacioppo, Petty, & Kao, 1984), which includes 18-items assessing a person’s preference for effortful cognitive tasks (e.g., “I prefer complex to simple problems”). Participants respond on a scale from 1 (extremely uncharacteristic of you) to 5 (extremely characteristic of you). The NCS is calculated by reverse coding the appropriate items, and then averaging across all items in the scale (see Appendix E).

Empathy was measured using the 28-item Interpersonal Relativity Index (IRI; Davis, 1983), which has been used in previous studies of reading habits (i.e., Mar et al., 2006). The IRI includes four subscales; fantasy, perspective taking, personal distress, and empathetic concern. Responding on the IRI requires selecting a point on a 5-point scale from A (“does not describe me well”) to E (“describes me very well”). The IRI correlates well with facial expression recognition (Besel & Yuille, 2010), as well as other measures of empathy such as the Empathy Quotient (Lawrence, Shaw, Baker, Baron-Cohen, & David, 2004). The IRI was calculated as an average across all items after appropriate reverse coding (see Appendix F).

Procedure

Participants were run individually in experimental rooms. After providing informed consent, participants were introduced to two apparently separate studies (although the order of these studies was randomised for each participant). Participants received a package of reading-related questionnaires under the heading “fiction reading and emotion”, which included the ART, reading habits, Transportability Scale, and the IRI, always in that order. The ART was presented on paper, but all other questionnaires and tasks were presented on a computer. In addition, participants were given the other measures under the heading of “gender and personality” which included the ASI, and Need for cognition questionnaires, and the two IATs (with the IATs presented in random order).

For the IATs, participants were given practice at categorising attribute and target words separately. If participants made selected the wrong key for the target or attribute, a red cross appeared on screen to inform participants of the error and another key press was required for the trial to proceed. After practice, attributes and target words were presented in congruent or incongruent trials. Table 3.2 shows the presentation order of blocks. Block order (congruent or incongruent first) was counterbalanced, and the order of IATs (strong or moral first) was also randomised. The same procedure followed for the moral-female IAT.

Table 3.2

Procedure and Categories for the Strong and Moral Implicit Association Tasks

	Left Key	Right Key	Left Key	Right Key
Practice	Male	Female	Male	Female
Practice	Strong	Good	Immoral	Moral
Congruent Test	Male + Strong	Female + Good	Male + Immoral	Female + Moral
Practice	Good	Strong	Moral	Immoral
Incongruent Test	Male + Good	Female + Strong	Male + Moral	Female + Immoral

Results

Descriptive statistics for all measures appear in Table 3.3. Due to the overall low score on the ART (mode of 3, with a range of 0 to 23 out of a potential score of 100), scores were collapsed across genre, and the overall ART measure was used in analyses. The fiction and non-fiction components were highly correlated ($r = .69, p < .01$).

IAT scores were calculated using the conventional method of IAT scoring (Greenwald et al., 1998). All error trials were removed from the data, and responses slower than 10,000 ms were eliminated (there were none in this sample); participants who responded faster than 300 ms on more than 10% of all trials were excluded from the analysis; and scores were calculated by subtracting the standardised average response times in incongruent trials from the congruent trials, such that higher scores reflected a preference for “congruent” trials.

Table 3.3

Means, Standard Deviations, and Reliability of Scales and Subscales

	Mean	SD	Cronbach α
Transportability	6.53	0.95	.88
IAT Moral	0.17	0.38	
IAT Strong	0.24	0.35	
Hostile Sexism	2.95	0.91	.88
Benevolent Sexism	3.11	0.80	.80
IRI	3.49	0.40	.81
Need for Cognition	3.49	0.56	.89
Reading Frequency	3.59	1.72	
Reading Volume	2.32	0.81	
ART	6.68	6.00	
ART Fiction	4.05	4.15	
ART Non-Fiction	3.24	3.07	
ART Foils	0.62	1.34	

Note: IAT = Implicit Association Test; IRI = Interpersonal Reactivity Index; ART = Author Recognition Task.

Pearson's bivariate correlations were computed for all measures. As shown in Table 3.4, reading as measured by the ART and self-report measures was negatively correlated with both explicit and implicit measures of sexism — though only for implicit-strong attitudes. The measures of sexism were positively correlated with each other, with the exception of implicit-moral attitudes. Implicit-moral attitudes were not correlated with explicit sexism, and were negatively correlated with implicit-strong attitudes. The measures of reading (reading frequency and reading volume) were also highly correlated, and for subsequent studies these measures were combined into one “Reading” measure. Explicit sexism was also negatively correlated with need for cognition, but not with transportability. In addition, transportability was not significantly correlated with measures of implicit

Table 3.4

Pearson's Correlation Coefficients for Reading Measures, Demographics, and Individual Differences Measures

	1.	2.	3.	4.	5.	6.	7.	8.	9.
1. Hostile Sexism									
2. Benevolent Sexism	.48**								
3. Read Frequency	-.28**	-.32**							
4. Reading Volume	-.30**	-.29**	.65**						
5. ART	-.33**	-.32**	.32**	.40**					
6. IAT-Moral	-.17	-.03	-.05	.11	.17				
7. IAT-Strong	.32**	.28*	-.01*	-.13	-.31**	-.61**			
8. NCS	-.28*	-.35**	.32**	.16**	.30**	-.15	.13		
9. Transportability	.09	-.11	.21	.25*	.19	-.06	.18	.31**	
10. IRI	-.11	-.06	.07	.03	.07	.00	.09	.22	.52**

Note: ART = Author Recognition Task; IAT = Implicit Association Test; NCS = Need for Cognition Scale; IRI = Interpersonal Reactivity Index.

* $p < .05$, ** $p < .001$.

sexism or the ART.

To test whether transportability moderates the relationship between reading and sexism, ordinary least squares (OLS) regressions in Hayes' PROCESS macro (Model 1) for SPSS (Hayes, 2013) were used. ART scores were used as the independent variable, sexism as the dependent variable, and transportability as a moderator (see Figure 3.1 as a conceptual model of moderation). The ART and transportability measures were mean centered, and a bias-corrected bootstrap analysis based on 5,000 bootstrap samples was run. Reading¹ did not interact with transportability for either measure of sexism (see Table 3.5). Adding participant gender as a second moderating variable (model 2 of the PROCESS macro) had no effect on the moderation analyses.

¹Using self-reporting reading habits instead of ART scores, the same pattern of results were also found for hostile and benevolent sexism.

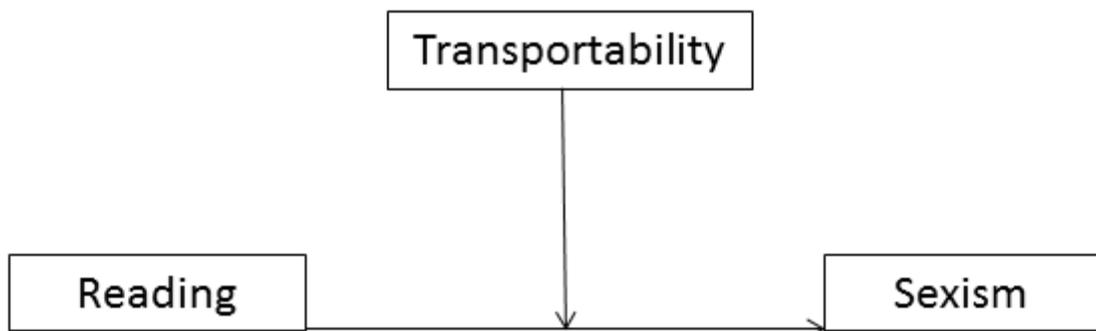


Figure 3.1. Conceptual model of the moderation analysis.

Table 3.5

Linear Model of Transportability and Reading as Predictors for Hostile and Benevolent Sexism

Measure		<i>b</i>	SE <i>b</i>	<i>t</i>	LLCI	ULCI
Hostile Sexism	Transportability	.11	.11	0.94	-.12	.33
	ART	-.05	.02	-2.65	-.08	-.01**
	Transportability x ART	-.03	.02	-1.36	-.07	-.01
Benevolent Sexism	Transportability	-.05	.10	-0.49	-.25	.15
	ART	-.04	.02	-2.49	-.07	-.01*
	Transportability x ART	-.002	.02	-0.08	-.04	.04
Moral IAT	Transportability	-.06	.05	-1.20	-.16	.04
	ART	.01	.01	1.84	-.00	.03
	Transportability x ART	-.01	.01	-1.21	-.03	.01
Strong IAT	Transportability	.11	.04	2.53	.02	.20**
	ART	-.02	.01	-3.41	-.04	-.01**
	Transportability x ART	.01	.01	1.39	-.01	.03

Note: ART = Author Recognition Task; IAT = Implicit Association Test.

* $p \leq .05$, ** $p < .01$.

Discussion

So called “bookworms” have been demonstrated to show benefits in language processing (Mol & Bus, 2011) and general knowledge (Stanovich & Cunningham, 1993). In addition, fiction readers have shown to have superior social skills (Mar et al., 2006), possibly extending to prosocial benefits such as prejudice reduction (Fong et al., 2015). Yet effects of long-term reading on sexism have received little examination; what is more, what research has been conducted failed to examine the boundary conditions for when these effects will emerge. In Study 1, it was predicted that people who read more fiction would also report lower levels of sexism, and that the relationship would be stronger for people

frequently or easily transported by reading. As predicted, a significant negative association was found between the overall ART and sexism; however, transportability did not moderate this association.

Due to the overall low scores on the ART, effects of fiction versus non-fiction reading could not be compared. However, the overall relation between reading and sexism is consistent with prior research. Although there is little work on reading and sexism per se, related research suggests that fiction readers show an advantage over non-readers (or primarily non-fiction readers) in several cognitive and affective domains, including theory of mind, empathy (Mar et al., 2006), and egalitarian sex roles (Fong et al., 2015). Continued investigation into reading and sexism is appropriate and future studies should use comparisons to non-fiction controls to properly establish this relationship.

Another novel aspect of this study was the inclusion of implicit measures of sexism. Implicit stereotypes (measured on the strong-good IAT) were positively correlated with both hostile and benevolent sexism, and negatively associated with ART scores. These results suggest that people who read more not only report explicit prosocial benefits (i.e., Mar et al., 2006; Fong et al., 2013) but also show decreased gender stereotype associations. This result is supported by research that shows that implicit attitudes may be changed when counter-stereotype examples, presented as part of a conceptual network (as may be present in fiction), are given (Froni & Mayr, 2005). Yet one limitation of this result is that the complex nature of this construct limits clear interpretation of the findings. For instance, a stronger association between men and strength or women and good may instead be interpreted as decreased implicit strength bias for women. Likewise, the negative association between implicit bias and reading may instead represent an implicit bias for the association between “men” and “good”. However, this test was still positively associated with both explicit sexism measures, and as such, the test may still be informative for the measurement of gender constructs, indicating a trend for decreasing implicit gender stereotyping with

increased long-term reading.

While the implicit strength/good bias was associated with explicit sexism measures, the second implicit gender test (moral-IAT) did not show an association with other variables, and was negatively associated with the implicit strength/good bias. Furthermore, implicit moral bias (unlike implicit good bias) for women did not correlate with the explicit benevolent sexism measure, nor was there any association with reading measures (as with the other sexism measures). These results may be due to having “immoral” as a negative attribute category (created in an attempt to have polarised comparison groups). Although women are predicted in Ambivalent Sexism Theory to be stereotyped as morally superior to men, it does not necessarily follow that men are stereotyped to be immoral. This may have caused difficulty for some participants trying to correctly categorise attributes, due to the high level of interference from the irrelevance of “immoral” attributes for both male and female targets.

The second hypothesis, that transportability would moderate the relation between reading and sexism, was not supported. However, note that most studies of transportability have focused on transportability as a predictor of transportation (Dal Cin et al., 2004; Bilandzic & Busselle, 2008), rather than a moderator of attitude change. Mazzocco et al. (2010) did find that transportability was relevant for attitudes towards homosexuality, but, as with previous studies this effect was mediated by acute transportation; a tendency to be transported only predicted attitudes to the extent that participants were actually transported in the study. Thus, a null result here does not preclude the possibility that reading effects are enhanced when the reader is in a transported state. Subsequent studies in the thesis therefore focus on acute transportation as a moderator of acute reading effects.

Finally, an obvious limitation of Study 1 is the correlational design, which limits the conclusions that can be drawn from these results. Although more reading may indeed lead to less sexism, it is also possible that less sexist individuals are more interested in reading.

To establish causality and direction, an experimental design is needed. This would involve, for example, providing participants with passages to read, and comparing reported sexism levels afterwards.

In summary, reading was associated with lower levels of reported sexism. However, the effects of fiction and non-fiction reading could not be separated. Experimentally assigning fiction and non-fiction passages would help to further extend these results, and would also address problems of interpretation with the current correlational design. In addition, transportability failed to show moderation effects on this relationship. However, as transportation and transportability are distinct concepts (Bilandzic & Busselle, 2008), the results of Study 1 do not necessarily imply that transportation will also fail to moderate the acute effects of reading on sexism. Thus, in Study 2, participants' sexism and transportation were assessed after reading fiction or non-fiction in the laboratory.

Chapter 4: Fiction and Content

Study 1 showed a negative association between sexism ratings and long-term reading. Due to the correlational design, it cannot be inferred that reading causes reductions in sexism, or whether less sexist individuals also prefer reading. Thus, experimental study of fiction and non-fiction is required to properly examine the relation between reading and sexism.

In addition, the effects of fiction and non-fiction could not be separated due to low levels of readership in both types of text (as shown by ART scores). Although non-fiction may be associated with transportation (i.e., Green & Brock, 2000), it is fiction reading that has been demonstrated as a superior method of persuasion over non-fiction. Correlational and experimental studies have shown that fiction is associated with social skills (Mar et al., 2006), empathy (Bal & Veltkamp, 2013) and reduced racial prejudice (Johnson, Jasper, et al., 2013), whereas reading non-fiction does not show these effects, and in some cases is negatively associated with prosocial attitudes.

Primarily, experimental studies comparing fiction and non-fiction have focussed on differences in social skills after reading. Kidd and Castano (2013) found that fiction, particularly literary fiction, improves cognitive and affective theory of mind compared to non-fiction or popular fiction. Literary fiction was selected using novels that had won literary awards, and it was argued that literary fiction helps readers to better imagine the characters' experiences compared to the more passive and predictable popular fiction (selected from bestsellers or from an anthology of popular fiction). However, because the novels selected as literary fiction were award winning, fiction type was potentially confounded with quality, a problem as quality is theoretically associated with transportation (Green & Brock, 2000). Bal and Veltkamp (2013) also compared fiction reading and non-fiction reading, and examined transportation (albeit not with the Transportation Scale) as a moderator for the effects of reading on empathy. Participants were given a fiction reading or a newspaper article, and reported transportation and empathy after reading. A week later, participants

were reassessed on empathy. After reading fiction, highly transported participants showed a greater increase in empathy over the week, compared to reading non-fiction, with the opposite trend found for less transported readers.

While most of the comparisons of fiction and non-fiction have demonstrated effects for social skills, little research has examined prosocial effects of fiction (compared to non-fiction) outside of empathy and theory of mind measures. Johnson, Jasper, et al. (2013), as described in Chapter 1, tested participants' racial prejudice after reading fiction and found that after reading about a Muslim woman who is confronted with race-related discrimination, participants' explicit and implicit biases against Arab-Muslims were reduced, compared to reading the same information in a non-narrative version. While these results indicate that the consequences of fiction can extend beyond social skills, few studies have examined this application of reading in comparison to non-fiction texts.

In addition to examining the effect of fiction versus non-fiction, the studies in this Chapter also examine whether the specific content of fiction matters for attitude change. Some studies on attitude change have specifically addressed beliefs or attitudes that are congruent with the content of experimental stories (Strange & Leung, 1999; Green & Brock, 2000; Appel & Richter, 2010). For example, de Graaf et al. (2009) tested general and specific beliefs about policy for asylum seekers, after reading a story about a female refugee unsuccessfully applying for asylum. Readers showed more story-consistent attitudes when evaluating specific policies included in the narrative, compared to participants who had not read the story. However, no effects were found for asylum policy in general. Green and Brock (2000) also tested whether specific or distal (more abstract) beliefs were influenced by the story used in their studies. They found that their story about a girl being murdered by a psychiatric patient influenced story-specific items (such as the belief that psychiatric patients' freedoms should be restricted), for more transported readers. However, more transportation readers did not report changes for distal beliefs ("crime doesn't pay"), or

general beliefs about a just world. These studies suggest that only beliefs specific to the content of the story will be altered, yet the results do not tell us if these specific beliefs would also be altered by reading other content (i.e., it could be that these specific beliefs are susceptible to change from reading *any* fiction, whereas more distal beliefs are not).

These studies are also not informative for beliefs about stereotyped groups. In studies that *have* examined narrative persuasion for discriminatory attitudes, including beliefs about homosexuality (Green, 2004) and race (Johnson, Jasper, et al., 2013), only one fiction passage was used in each experimental condition, and so content was not manipulated. In another relevant study, Richter et al. (2013), as described in Chapter 1, did test content effects by comparing two stories for the effects of content on beliefs. The authors found that for highly transported readers, both of their experimental stories — regardless of content — resulted in increased reporting of feminine traits, compared to less transported readers. However, closer examination of the results also revealed that for the content-relevant story, femininity *was* higher compared to the control (content-irrelevant) condition for highly transported readers, and this difference was statistically significant. These results tentatively suggest that fiction reading per se may influence transported readers' beliefs, but the effects may be more pronounced when a story's content is relevant to the attitude domain being assessed.

Another limitation of Study 1 was that although a significant association between reading and sexism was found, there was no way to determine whether this was conditional upon transportation. The effect was not conditional on chronic transportation, but a tendency to be transported is no guarantee that readers will be transported during any particular instance of reading, or that effects of transportation will be cumulative and quantifiable.

In summary, Study 2 used an experimental manipulation of fiction reading to test for a causal relationship between reading and sexism, to distinguish fiction from non-fiction effects, to assess the importance of story content, and to examine the role of transportation

in any effects. Participants were given either fiction or non-fiction passages, and rated transportation and sexism after reading. I predicted that readers of the fiction passages, who were also more transported, would report lower sexism ratings compared to reading the non-fiction passage (e.g., a reading condition by transportation interaction). Second, I predicted that the gender-relevant fiction passage would show greater sexism reduction, compared to the gender-irrelevant passage, again depending on transportation.

Study 2

Method

Participants

Participants were 180 Amazon Mechanical Turk (MTurk) workers. MTurk is an online marketplace that allows “workers” to complete tasks for a nominal payment. The largest MTurk samples are from the United States, followed by India (Paolacci & Chandler, 2014), and samples provide comparable results to those found in university laboratory studies (Johnson & Borden, 2012). Participants were restricted to the United States in all MTurk samples in this thesis. Participants were 99 males and 80 females (and one participant who identified as other), with an age range of 18 to 71 years. Each participant was paid 60 cents.

Materials

Experimental Manipulation. Participants read one of three passages (see Appendix G). The first passage was adapted from Chapter 28 (2,384 words) of the novel *The Handmaid’s Tale* by Margaret Atwood (1985). The novel is set in dystopian North America, where a fundamentalist Christian sect has over taken the government and implemented a totalitarian regime known as The Republic of Gilead. Gilead demands that women not read, write, or have autonomy. In this passage, the narrator describes an overtly sexist event in which she and other women lose their jobs, money, and independence due to their gender. Parts of the passages were removed to avoid confusion and reduce length.

The second passage used was *Two Were Left*, a short-short story (477 words) by Hugh B. Cave (1942) about an Inuit boy and his dog. Both become stranded on an ice floe, and each considers attacking the other in order to survive, but they resist in a testament to their friendship. Eventually they are rescued by a passing plane. *Two Were Left* has been used in previous research on transportation (Green & Brock, 2000), and does not contain any themes explicitly related to gender.

The third passage was a non-fiction article about music in space called *A Brief History of Musical Firsts in Space* (Rosen, 2012), detailing the origin of music being played in space (782 words). The article was edited to remove potential sources of confusion for readers, such as links to music referenced in the story.

Dependent Measures and Covariates. Explicit sexism¹, transportability, and self-reported reading habits were measured as in Study 1. In addition, state transportation was assessed with the Transportation Scale (Green & Brock, 2000), one of the most widely used measures of narrative engagement. It contains 12 items, with 3 subscales for imagery (“I could picture myself in the scene of the events described in the narrative”), affect (“the narrative affected me emotionally”), and cognition (“I found my mind wandering while reading the narrative”, which is reverse coded), although the scale as a whole is a better predictor of outcomes (Green & Brock, 2000). All items are rated on a scale of 1 (not at all) to 7 (very much). All items were averaged (after appropriate reverse-coding) to form the transportation score (see Appendix H).

Additional Measures. Several post-manipulation checks were also included: whether the reader wanted to know what happened next in the story (‘yes’, ‘no’, or ‘maybe’; labelled as “future reading”), how much attention they thought they gave to reading the story (“very little attention”, “my attention varied”, and “a great deal of attention”), and what the

¹Implicit measures of sexism were not included due to the limitations of response time methods for online data collection

story was about (selecting from a list of themes; see Appendix I).

Procedure

The study was presented on Mechanical Turk, using Qualtrics survey software (Qualtrics, 2005). Qualtrics is a private research software company based in Provo, Utah, that allows subscribers to design and distribute surveys for online data collection. All participants completed the Transportability Scale and then were randomly assigned to one of the three reading conditions. Participants were given the following instructions:

Next you will be presented with a short story. Please take your time and read it properly; however, the main point is to enjoy the story. You may want to read the passage a couple of times and afterwards you will be asked a few questions about the story.

This was followed by the ASI and Transportation Scale, future reading, and attention checks. All items within questionnaires were randomised, as well as the order of the post-manipulations scales. Demographic and reading habit questions were presented last.

Results

To check that attention was held across conditions, reported attention and themes of the stories were analysed between conditions. Only one theme answer was correct for each condition, and the correct theme was selected by 77.8% of participants. The frequency of correctly (versus incorrectly) identified themes was also the same across reading conditions ($X^2(2) = 0.23, p = .89$). For self-reported attention, 98.3% of participants reported moderate (“my attention varied while reading”), or high levels (“great deal of attention”) of attention during reading. Removing the participants who reported incorrect themes, or who reported little attention, did not influence the pattern of results, so these participants were retained in the analyses to maximise statistical power.

Descriptive statistics for all dependent measures, the results of reliability analyses, and one-way ANOVAs for reading condition, appear in Table 4.1. Transportation did (marginally) differ statistically across condition. The only other significant effect was on future reading. Independent t-tests revealed that there were no significant differences between *The Handmaid's Tale* and *Musical Firsts*, $t = 1.51$, $p = .13$, 95% CI [-.07, .50], or *The Handmaid's Tale* and *Two Were Left*, $t = 1.30$, $p = .19$, 95% CI [-.09, .45]; however, more participants wanted to know what happened next in *Two Were Left* compared to *Musical Firsts*, $t = 2.80$, $p < .01$, 95% CI [.12, .67].

Table 4.1

Descriptive Statistics, Scale Reliability, and One-Way ANOVA Between Reading Conditions

		Fiction- NG <i>n</i> = 53	Fiction- G <i>n</i> = 61	Non- Fiction <i>n</i> = 66	One-Way ANOVA <i>p</i>	Cronbach's <i>α</i>
Transportability	Mean	5.82	6.07	6.25	.19	.93
	SD	1.44	1.13	1.25		
Hostile sexism	Mean	2.87	2.78	2.60	.42	.94
	SD	1.14	1.10	1.13		
Benevolent sexism	Mean	3.17	3.04	3.10	.83	.92
	SD	1.16	1.06	1.09		
Transportation	Mean	4.75	4.45	4.35	.08	.84
	SD	0.94	0.85	1.09		
Reading	Mean	3.92	3.74	4.22	.22	
	SD	1.51	1.48	1.58		
Future Reading	Mean	0.60	0.43	0.21	.02	
	SD	0.69	0.76	0.83		
Attention	Mean	2.85	2.89	2.82	.65	
	SD	0.46	0.32	0.43		
Correct Theme	Mean	1.76	1.79	1.79	.89	
	SD	0.43	0.41	0.42		

Note: Fiction-NG = no gender content; Fiction-G = gender content.

Main Analyses

First, I compared fiction to non-fiction, by collapsing the gender-related and gender-unrelated (*Two Were Left*) passages to form a single “fiction” condition, to contrast with the

non-fiction control. The data were analysed using Hayes' (2013) PROCESS macro (model 1) for SPSS, with condition (fiction versus non-fiction) as the independent variable, hostile and benevolent sexism as the dependent variables (in separate models), and transportation as a moderator variable. As shown in Table 4.2, transportation was a significant predictor for hostile sexism, and a significant interaction was found between transportation and reading condition for benevolent sexism, and a marginal interaction for hostile sexism. No other effects were found and adding transportability or self-reported reading habits as covariates did not change the results. Conditional effects of reading condition are presented in Figure 4.1 and 4.2.

Table 4.2

Linear Model of Transportation and Experimental Conditions (Fiction Versus Non-Fiction) as Predictors for Hostile and Benevolent Sexism

Measure		<i>b</i>	SE <i>b</i>	<i>t</i>	LLCI	ULCI
Hostile Sexism	Transportation	-0.24	0.08	-2.76	-0.41	-0.07**
	Condition	0.25	0.17	1.47	-0.09	0.59
	Transportation × Condition	-0.33	0.17	-1.97	-0.67	0.00*
Benevolent Sexism	Transportation	-0.04	0.08	-0.47	-0.21	0.13
	Condition	-0.02	0.17	-0.10	-0.35	0.32
	Transportation × Condition	-0.44	0.17	-2.62	-0.77	-0.11**

Note: * $p \leq .05$, ** $p < .01$.

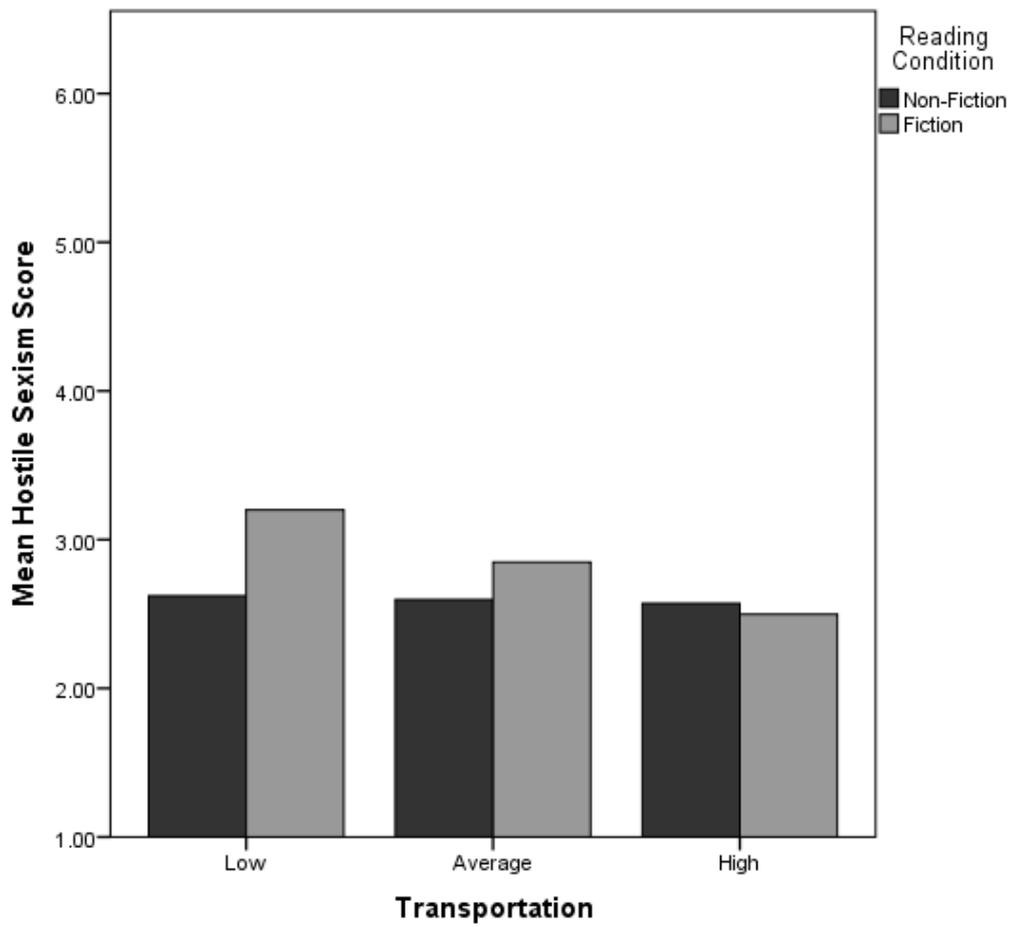


Figure 4.1. Conditional effects of reading condition on hostile sexism at values (± 1 SD and mean) of transportation.

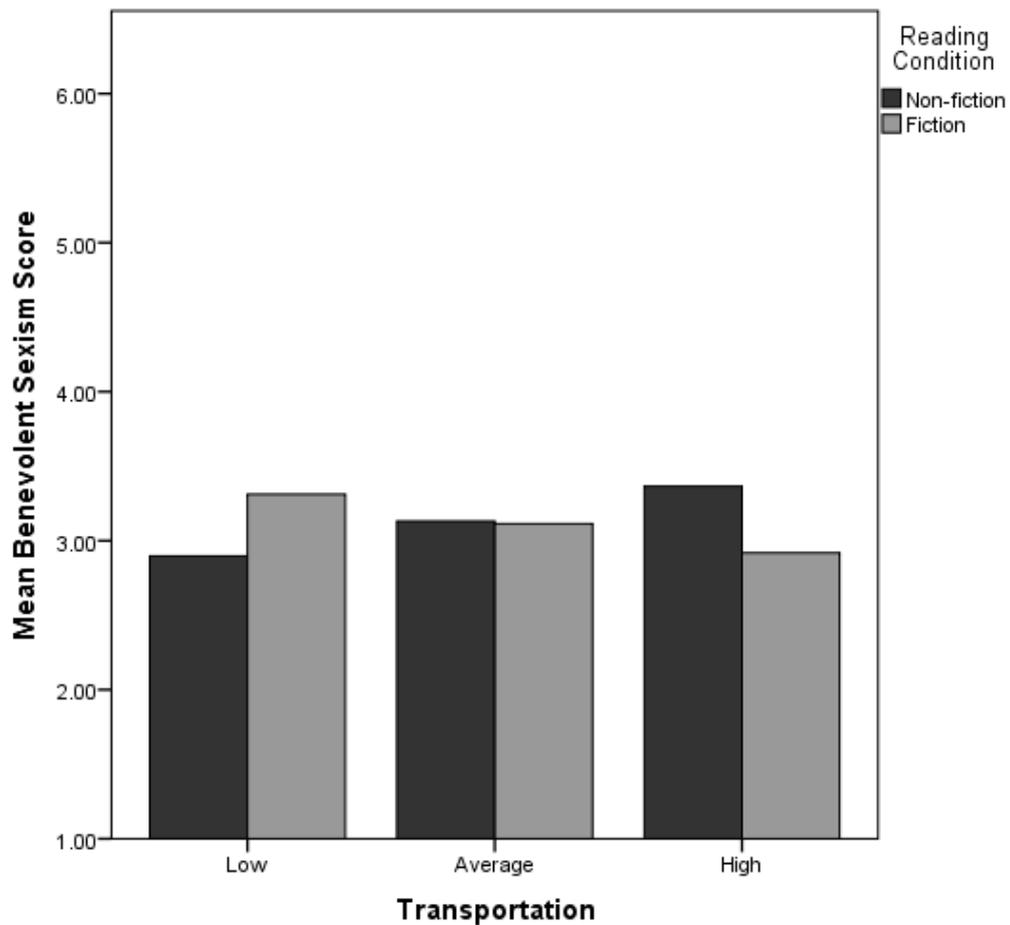


Figure 4.2. Conditional effects of reading condition on benevolent sexism at values (± 1 SD and mean) of transportation

To further probe this interaction, the Johnson-Neyman's (J-N) Technique was conducted using the script for SPSS (Hayes & Matthes, 2009). This analysis identifies the value(s) of the moderator variable at which the relationship between X and Y is statistically significant. The J-N technique is superior to other probe methods such as the pick-a-point method (Miller, Stromeyer, & Schwieterman, 2013), as it avoids arbitrary selection of values of the moderator in order to look at conditional effects (Hayes, 2013).

The J-N technique revealed regions of significance for low and high levels of transportation. Below a score of 3.3 on the Transportation Scale, fiction reading was associated

with a statistically significant increase in benevolent sexism, $b = .25$, $SE = .13$, $t = 1.97$, $p = .05$, 95% CI [.00, .51]. In addition, below a transportation score of 4.2, reading fiction was positively associated with hostile sexism, $b = .35$, $SE = .18$, $t = 1.97$, $p = .05$, 95% CI [.00, .69]. At higher levels of transportation, over a score of 5.6, reading fiction was associated with less benevolent sexism, $b = -.25$, $SE = .13$, $t = -1.97$, $p = .05$, 95% CI [-.51, .00].

These analyses were repeated in order to compare the two fiction conditions. As above, Hayes' (2013) PROCESS macro (model 1) for SPSS was used, with reading condition (gender-relevant versus gender-irrelevant) as the independent variable, hostile and benevolent sexism as the dependent variables (in separate models), and transportation as a moderator variable. Transportation was a significant predictor for both hostile and benevolent sexism, however, no interaction between fiction conditions and transportation were observed for hostile or benevolent sexism (see Table 4.3), although the trend of the results was for lower sexism in the gender-relevant fiction conditions (see Figure 4.3 and Figure 4.4).

Running the same analyses with transportability as the moderator (for both fiction and non-fiction comparisons) revealed no significant effects.

Table 4.3

Linear Model of Transportation and Experimental Conditions (Fiction-Gender and Fiction-No Gender) as Predictors for Hostile and Benevolent Sexism

Measure		<i>b</i>	SE <i>b</i>	<i>t</i>	LLCI	ULCI
Hostile Sexism	Transportation	-0.39	0.11	-3.39	-0.61	-0.16**
	Condition	-0.10	0.10	-1.00	-0.31	0.10
	Transportation × Condition	-0.10	0.11	-0.91	-0.33	0.12
Benevolent Sexism	Transportation	-0.23	0.12	-1.96	-0.46	0.00*
	Condition	-0.09	0.10	-0.91	-0.30	0.11
	Transportation × Condition	-0.11	0.12	-0.98	-0.34	0.12

Note: * $p \leq .05$, ** $p < .01$.

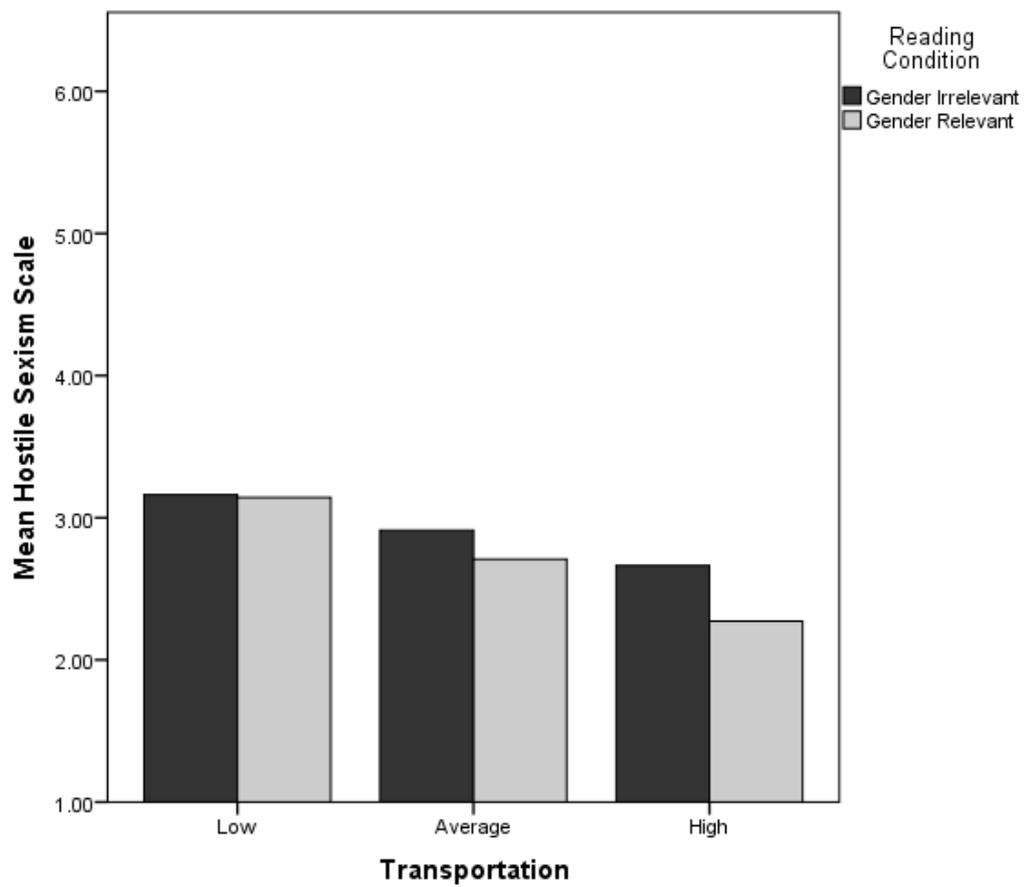


Figure 4.3. Conditional effects of reading condition on hostile sexism at values (± 1 SD and mean) of transportation

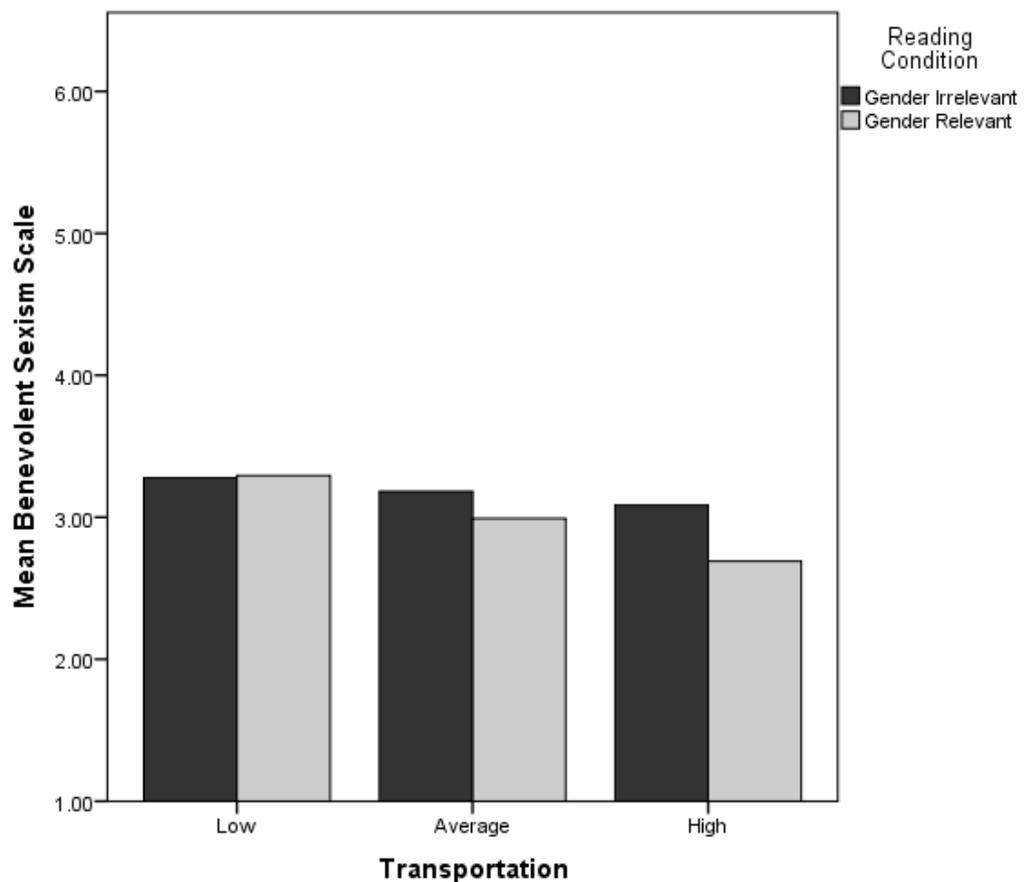


Figure 4.4. Conditional effects of reading condition on benevolent sexism at values (± 1 SD and mean) of transportation

Discussion

After finding an association between long-term reading and sexism in Study 1, the next step was to experimentally compare fiction and non-fiction texts. There were four goals of Study 2: to experimentally test for a causal relationship between reading and sexism, to compare fiction and non-fiction effects, to assess whether story content would differentially affect attitudes, and to examine the role of transportation.

Due to the correlational design of Study 1, the causal relationship between reading and sexism could not be tested. This meant that multiple interpretations of the correlation were possible: people who read more could be less sexist, *or* less sexist people could choose

to read more. While Study 2 was not a full test of the reading-sexism relation, it does provide plausible evidence that reading leads to attitude change for sexism, rather than (or in addition to) the other way around. What is more, these effects were shown to be due to reading *fiction*.

Fiction indeed was shown to cause changes in sexism scores, compared to non-fiction, although these effects were moderated by transportation. Transported readers reported lower sexism when reading fiction, compared to non-fiction (and vice-versa for less transported readers). The difference between fiction and non-fiction is consistent with studies by Mar et al. (2006), Kidd and Castano (2013), Fong et al. (2013), and Bal and Veltkamp (2013), as reviewed in Chapter 3. In correlational studies, long-term fiction reading was positively associated with social skills, while reading non-fiction was either negatively associated (Mar et al., 2006), or not associated with social skills (Fong et al., 2013). These findings are supported by short term experimental studies, in which reading fiction enhanced theory of mind, compared to reading non-fiction (Kidd & Castano, 2013). Study 2 helps extend these previous findings of fiction versus non-fiction reading, to change in discriminatory beliefs.

Why does fiction reading lead to such effects? What little research exists for fiction and non-fiction reading tends to examine the effects of fiction on social skills (Kidd & Castano, 2013; Bal & Veltkamp, 2013). Therefore, fiction may decrease discriminatory attitudes due to increased social skills such as empathy, which has been shown in previous studies even after one reading (Kidd & Castano, 2013). This possibility is discussed further in the General Discussion.

The fact that reading fiction was only effective under the condition of high transportation is consistent with a number of studies of narrative persuasion (i.e., Green, 2004; Green & Brock, 2000; Richter et al., 2013; Appel & Richter, 2010; Shedlosky-Shoemaker et al., 2014; Bal & Veltkamp, 2013), where greater transportation when reading fiction was asso-

ciated with greater belief change after reading (Green, 2004; Green & Brock, 2000; Richter et al., 2013). Bal and Veltkamp (2013), for example, found that giving participants fiction readings increased empathy, but only for more transported readers, and not for non-fiction conditions (Bal & Veltkamp, 2013). Consistent with these findings, highly transported readers in Study 2 reported lower sexism after reading fiction, compared to non-fiction. Although transportation was also a predictor of sexism, generally this reflected the reading condition effects (i.e., transportation scores overall may be associated with sexism, but it is because transportation is associated with sexism in the fiction condition, with no association in the non-fiction condition).

Interestingly, among participants who reported particularly low transportation, reading fiction was associated with *higher* levels of sexism, compared to reading non-fiction. These results were also consistent with Bal and Veltkamp's (2013) study, where less transported participants reported (nonsignificant) decreases in empathy. Transportation is proposed to reduce counterarguing and resistance to persuasion. It is possible that participants who report low transportation and who read fiction may experience an increased opportunity for counter-arguing, allowing these readers to react to perceived messages in stories (Hinyard & Kreuter, 2007; Green & Clark, 2013). Alternatively, participants who already felt sceptical about such beliefs may have struggled to become transported into the fiction story.

While Study 2 found effects of transportation, no effects were found for measures of transportability, consistent with the results of Study 1. Transportability has been theorised as an antecedent for transportation (van Laer et al., 2014), and on the surface these measures appear highly similar. Yet the differences found between them further emphasise that transportation and transportability in fact measure different aspects of the transportation experience. While comparing these two measures was not the purpose of the study, this provides some assurance that the differences observed for reading and attitudes are likely due to transportation during reading, rather than reflecting more transportable participants

within the reading conditions.

Surprisingly, the effects of fiction reading on sexist beliefs did not depend on whether the fictional passage actually contained evidence of sexism, a result inconsistent with many studies of narrative persuasion that show that fiction tends to increase story-consistent beliefs (Strange & Leung, 1999; Green & Brock, 2000; Appel & Richter, 2010; Green, 2004). It may be that content does not matter in the case of sexist attitudes, or that content differences are relatively small and the study was underpowered to detect them (although the results were not significant, there was a general trend for lower sexism in the gender-relevant fiction condition for more transported readers, compared to the gender-irrelevant condition). The two fictional passages differed not only in content, but also on narrative perspective, story length and other factors, differences that may have obscured small content effects. Passages from the same novel could be used to control these potential confounds, and thereby increase the study's sensitivity.

In summary, Study 2 demonstrated that fiction reading does have superior effects over non-fiction reading for sexism, at least for transported readers. Content was also examined in this study; however, no differences were found between fiction conditions despite a non-significant trend. If content effects exist, they are small, and so greater experimental control between reading conditions may help to reveal them. This limitation was addressed in Study 3. Participants were given readings from the same novel that included either gender-relevant or gender-irrelevant content. It was again predicted that reading and transportation would interact, such that participants who were more transported would show lower levels of sexism, particularly for the fiction passage with explicit gender content, compared to a control passage.

Study 3

Method

Participants

Participants were 192 MTurk workers (81 male and 111 female), with an age range of 19 to 77 years. Workers were paid 60 cents each.

Materials and Procedure

Study 3 was identical to Study 2, with the following exceptions. First, the gender-irrelevant fiction passage was replaced with a chapter of similar length (2,227 words) from the same novel (*The Handmaid's Tale*, Chapter 27), which does not explicitly reference a sexist event, but still contains a dystopian narrative describing the oppressive regime of Gilead, including murder of rebels (see Appendix G). As with the experimental chapter, some passages from the chapter were edited to avoid confusion. Both readings were described as “a chapter from a novel”. Second, the previous attention check items were replaced with new versions that asked specific details about the story (e.g., “what was the name of the narrator’s friend?”). Third, a mood measure was added for exploratory purposes, as mood has previously been tied to stereotype use (Park & Banaji, 2000). Participants were asked to rate the extent to which they felt happy, sad, afraid, angry, surprised, and disgusted “right now”, on a scale from 0 to 8. Finally, after reading, participants were also asked if they found the reading difficult, and whether they had read the passages before (both questions answered as a ‘yes’ or ‘no’).

Results

Responses to “happy” were reverse scored and averaged with negative items to form a composite negative mood score, with higher scores reflecting more negative mood. Independent t-tests were conducted on dependent measures to compare between reading condi-

tions. The results of the t-test, scale reliability, and the descriptive statistics are presented in Table 4.4.

Table 4.4

Means and Standard Deviations as a Function of Reading Condition (Gender vs. Control)

	Gender Condition	Control Condition	α	t	p
	$n = 97$	$n = 95$			
	Mean (SD)	Mean (SD)			
Transportation	4.82 (0.91)	4.41 (1.05)	.83	2.92	.004
Hostile Sexism	2.47 (1.22)	2.69 (1.10)	.92	-1.30	.197
Benevolent Sexism	3.13 (1.31)	3.20 (1.21)	.92	-0.42	.675
IRI	3.45 (0.47)	3.36 (0.62)	.89	1.41	.161
Prior reading	1.99 (0.10)	1.94 (0.25)		1.98	.049
Reading difficulty	1.86 (0.34)	1.80 (0.40)		1.19	.234
Reading	4.47 (1.60)	4.05 (1.78)		1.75	.082
Mood	2.30 (1.90)	1.89 (1.61)	.88	1.60	.111

Note: Here α is Cronbach's α . IRI = Interpersonal Reactivity Index.

Shown in Table 4.4, reading condition showed no statistically significant differences for sexism, or other dependent measures except for transportation and prior reading (including prior reading as a covariate had no effect in subsequent analyses). Pearson's correlations were also conducted to compare mood to transportation and sexism; however, mood was not significantly associated with hostile ($r = .06$) or benevolent ($r = -.08$) sexism, nor with transportation ($r = .11$).

Reading condition (gender-relevant versus gender-irrelevant) was compared using Hayes's (2013) PROCESS macro (model 1) for SPSS, with condition as the independent variable, hostile and benevolent sexism as the dependent variables (in separate models), and transportation as a moderator variable. As shown in Table 4.5, transportation was a significant predictor for hostile sexism, but no significant interaction (or any other effect) was found between transportation and reading condition for either benevolent sexism, or hostile sexism.

Table 4.5

Linear Model of Transportation and Experimental Conditions as Predictors for Hostile and Benevolent Sexism

Measure		<i>b</i>	SE <i>b</i>	<i>t</i>	LLCI	ULCI
Hostile Sexism	Transportation	-0.28	0.08	-3.30	-0.44	-0.11**
	Condition	-0.10	0.17	-0.61	-0.43	0.23
	Transportation × Condition	0.20	0.17	1.17	-0.13	0.53
Benevolent Sexism	Transportation	-0.01	0.10	-0.14	-0.20	0.17
	Condition	-0.09	0.19	-0.38	-0.44	0.30
	Transportation × Condition	0.11	0.19	0.59	-0.26	0.49

Note: ** $p < .01$.

Although there were no differences between fiction conditions, to test whether the overall fiction effects were comparable to those of Study 2, the two fiction conditions were recoded as one fiction condition and compared to the non-fiction condition for Study 2, using model 1 from Hayes' (2013) PROCESS macro. Again, reading condition (fiction versus non-fiction) was used as the independent variable, transportation as the moderator variable, and benevolent and hostile sexism (in separate models) as the dependent variable.

As seen in Table 4.6, there was a marginally significant interaction for benevolent sexism (see Figure 4.5 for conditional effects), but no other significant effects. Transportation was a significant predictor for hostile sexism, and though reading condition had no effect, there was a marginal interaction ($p = .07$) between reading condition and transportation for hostile sexism (for conditional effects see Figure 4.6).

Table 4.6

Linear Model of Transportation and Experimental Conditions as Predictors for Hostile and Benevolent Sexism

Measure		<i>b</i>	SE <i>b</i>	<i>t</i>	LLCI	ULCI
Hostile Sexism	Transportation	-0.23	0.07	-3.35	-0.37	-0.10**
	Condition	0.00	0.16	-0.02	-0.32	0.32
	Transportation × Condition	0.28	0.15	1.82	-0.02	0.58*
Benevolent Sexism	Transportation	0.04	0.07	0.54	-0.11	0.19
	Condition	-0.02	0.18	-0.12	-0.37	0.32
	Transportation × Condition	0.27	0.16	1.63	-0.06	0.59

Note: ** $p < .01$, * $p = .10$.

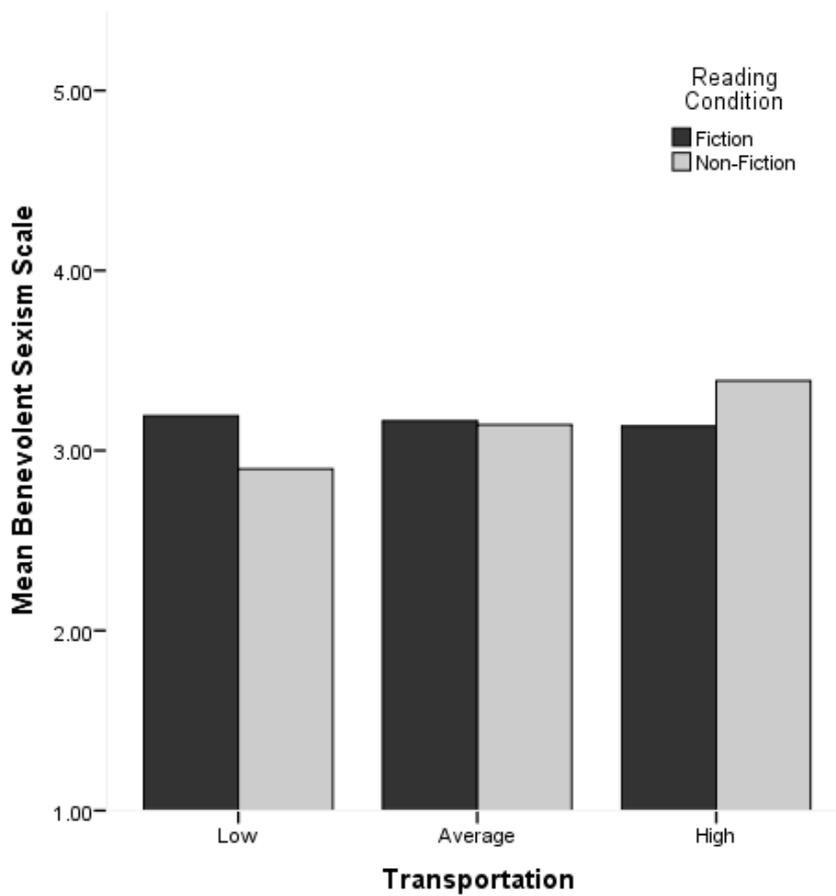


Figure 4.5. Conditional effects of reading condition on benevolent sexism at values (± 1 SD and mean) of transportation.

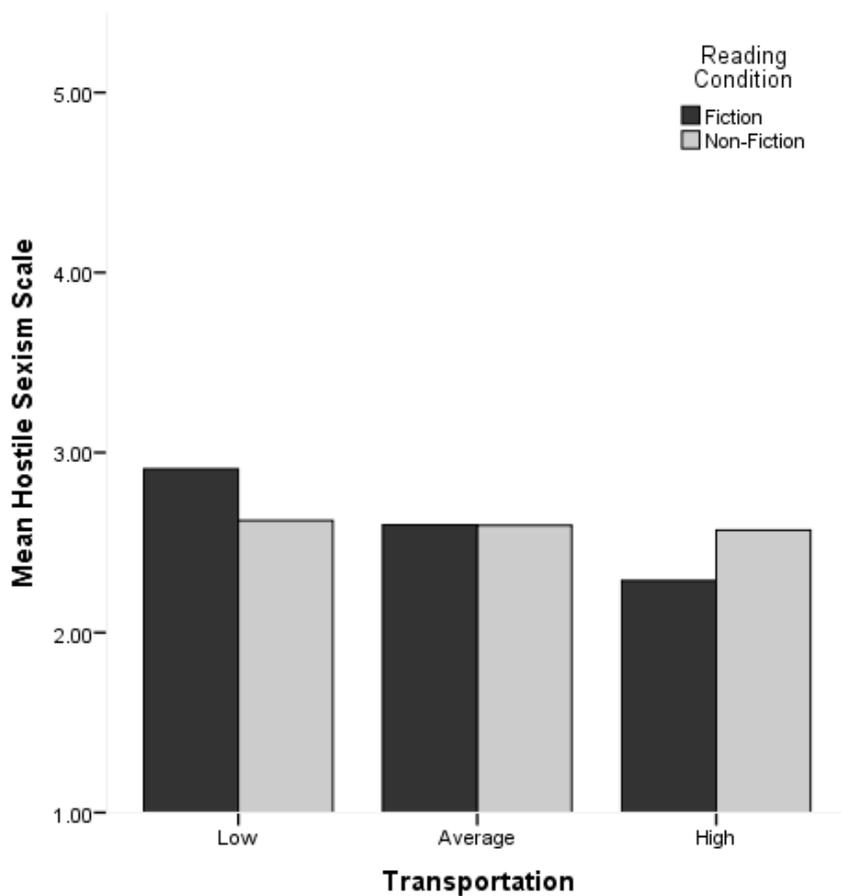


Figure 4.6. Conditional effects of reading condition on hostile sexism at values (± 1 SD and mean) of transportation.

Discussion

Study 3 was conducted to further examine potential effects of fiction content, using passages from the same novel to reduce confounds that may have been present in Study 2. However, no differences were found for sexism between fiction conditions, although transportation was significantly different between readings. Mood did not correlate with transportation or sexism.

The null effects for reading condition again are surprising, considering the results of previous studies (de Graaf et al., 2009; Richter et al., 2013). Although the design of the

study, which matched the two fiction readings in terms of length, style, and general context, was more powerful than that of Study 2, it was still limited in several ways. First, transportation was higher in the experimental condition, compared to the control. This poses a conceptual problem as the variability and effects of reading condition are then entangled with the effects of transportation. Using the *same* passage in both reading conditions would help to address this limitation. Here, the same passage about women (gender-relevant content) could be adapted in order to use as a control, especially if the control was about another minority group (gender-irrelevant content). This would serve to assess sexism specifically, while still keeping all other aspects of the story constant.

Second, effects of narrative persuasion have shown a tendency to emerge (and therefore potentially strengthen), over time; a phenomenon known as sleeper effects. Persuasion literature has already documented sleeper effects (see Kumkale & Albarracin, 2004) and narrative persuasion in particular has been shown to be susceptible to absolute sleeper effects (Appel & Richter, 2007; Bal & Veltkamp, 2013). It is possible that content effects may reveal themselves over time.

In sum, the studies in this thesis have shown belief change may occur among transported readers immediately after reading fiction (versus non-fiction), but not as a function of fiction content. It remains possible, however, that fiction content effects would emerge if stories were otherwise matched on other dimensions, or that they would emerge over time. Study 4 examined these possibilities by providing participants with the exact same passage, the only differences being changes in the minority status of the protagonist (female or Asian-American). In addition, the participants completed attitude measures of sexism and racism, at two time points. If content is important for belief change, then effects may emerge over time for both racism and sexism passages; however, these effects would only be present for the relevant passages (i.e., sexism would be predicted to decrease after reading the sexism passage, but not the racism passage, and vice versa), for more transported

readers.

Study 4

Method

Participants

Participants were 103 University of Otago students (32 male, 70 female, and 1 participant identifying as other), recruited from a student job placement service and paid NZ\$15 to cover travel costs. Participants were aged between 17 and 49 years of age.

Materials and Procedure. Study 4 was identical to Study 3, with the following exceptions. First, the mood measure was excluded. Second, the control passage was created by substituting all references to women in the original experimental condition, with details of Asian-American men. For example: “All those women [Asian-Americans] having jobs: hard to imagine, now, but thousands of them had jobs, millions. It was considered the normal thing. Now it’s like remembering the paper money, when they still had that.” (Atwood, 1985, p. 182.). In some parts, references to women were replaced with male references, rather than explicitly referring to the characters as Asian-American. For example, “It’s outrageous, one woman [man] said, but without belief.” (Atwood, 1985, p. 186.). Some of the text was removed to aid comprehension in the racism condition, and these parts were also removed in the sexism condition. These changes were only minor and did not influence plot points or comprehension of the story (see Appendix J for the full passage).

Third, the Scale of Anti-Asian American Stereotypes (SAAAS) was included as a measure of racism towards Asian-Americans (Lin, Kwan, Cheung, & Fiske, 2005). This measure includes two subscales, measuring competence and unsociability. The SAAAS was developed from the same theoretical model as the ASI, the stereotype content model (Lin et al., 2005). The competence measure in particular is theorised to assess ambivalent prejudice (analogous to benevolent sexism in the ASI). Like the ASI, the SAAAS is measured

on a scale from 0 (strongly disagree) to 5 (strongly agree). Example items include “Asian-Americans are not very street smart” from the sociability subscale, and “Asian Americans can sometimes be regarded as acting too smart” for the competence subscale (see Appendix K).

Fourth, a follow-up survey was sent to participants via an email link two weeks after participating. In the follow-up questionnaire, transportation, SAAAS, and ASI measures were repeated. Participants were incentivised by the opportunity to win NZ\$100 for completing the second survey.

Results

Descriptive statistics and independent t-tests comparing each condition within time points are presented in Table 4.7. For completion of the second survey (two weeks after the first), 64 participants were retained from the original sample (18 male, 45 female, and 1 participant identifying as other), ranging in age from 18 to 49 years.

Table 4.7

Descriptive Statistics and Independent Samples T-Tests for Measured Variables as a Function of Time and Reading Condition

	Time 1					Time 2				
	Sexism		Racism		<i>p</i>	Sexism		Racism		<i>p</i>
	<i>n</i> = 45		<i>n</i> = 58			<i>n</i> = 30		<i>n</i> = 34		
Mean	SD	Mean	SD		Mean	SD	Mean	SD		
Transportation	4.19	0.93	4.37	0.89	.32	3.81	0.94	3.87	1.01	.80
Hostile Sexism	3.04	1.05	2.78	0.99	.20	2.91	1.19	3.01	0.96	.73
Benevolent Sexism	2.94	0.92	2.99	0.98	.80	2.91	0.96	3.19	0.86	.23
SAAAS-C	3.54	0.91	3.44	0.98	.58	3.42	0.95	3.50	1.02	.75
SAAAS-S	3.18	0.69	3.04	0.83	.35	2.92	0.86	3.16	0.93	.29
IRI	3.54	0.40	3.54	0.38	.95					
Reading	3.77	1.49	3.80	1.50	.91					
Prior Reading	1.98	0.15	1.97	0.18	.71					
Attention	2.67	0.56	2.79	0.52	.25					

Note: SAAAS-C = Competence Subscale from the Scale for Anti-Asian American Stereotypes; SAAAS-S = Sociability Subscale; IRI = Interpersonal Reactivity Index.

To compare the two fiction conditions, the data were analysed using Hayes' (2013) PROCESS macro (model 1) for SPSS at time 1 for each subscale, then at time 2 for each subscale. For each time point, reading condition was the independent variable, transportation was the moderator variable, and benevolent sexism, hostile sexism, racism (sociality), and racism (competence) were the dependent variables (in separate models). As shown in Table 4.8, although transportation was a significant predictor for several of the measures, there were no other effects, nor significant interactions between transportation and reading condition for dependent measures. The only exception to this was the racism (competence) subscale at time 2. Conditional effects of transportation scores on reading condition for the competence subscale are presented in Figure 4.7.

Table 4.8

Linear Model of Transportation and Reading Conditions as Predictors for Hostile Sexism, Benevolent Sexism, and Sociability and Competence Racism Subscales at Time 1 and Time 2

		<i>b</i>	SE <i>b</i>	<i>t</i>	LLCI	ULCI
Time 1						
Hostile Sexism	Transportation	-0.21	0.11	-1.91	-0.43	0.01
	Reading Condition	-0.22	0.20	-1.12	-0.62	0.17
	Transportation × Condition	0.12	0.22	0.54	-0.32	0.56
Benevolent Sexism	Transportation	-0.25	0.10	-2.49	-0.46	-0.05**
	Reading Condition	0.10	0.19	0.51	-0.27	0.47
	Transportation × Condition	0.05	0.21	0.24	-0.36	0.46
SAAAS-S	Transportation	-0.19	0.08	-2.27	-0.35	-0.02*
	Reading Condition	-0.10	0.15	-0.67	-0.40	0.20
	Transportation × Condition	0.25	0.16	1.49	-0.08	0.57
SAAAS-C	Transportation	-0.26	0.10	-2.58	-0.46	-0.06**
	Reading Condition	-0.05	0.18	-0.27	-0.41	0.31
	Transportation × Condition	0.35	0.20	1.72	-0.05	0.75
Time 2						
Hostile Sexism	Transportation	-0.41	0.15	-2.75	-0.71	-0.11**
	Reading Condition	0.04	0.26	0.14	-0.47	0.55
	Transportation × Condition	0.38	0.30	1.24	-0.23	0.98
Benevolent Sexism	Transportation	-0.41	0.13	-3.27	-0.66	-0.16**
	Reading Condition	0.22	0.21	1.05	-0.20	0.65
	Transportation × Condition	0.19	0.25	0.76	-0.31	0.70
SAAAS-S	Transportation	-0.24	0.13	-1.85	-0.50	0.02
	Reading Condition	0.21	0.22	0.93	-0.24	0.65
	Transportation × Condition	0.25	0.26	0.96	-0.27	0.78
SAAAS-C	Transportation	-0.27	0.14	-1.96	-0.55	0.01*
	Reading Condition	0.04	0.24	0.16	-0.43	0.51
	Transportation × Condition	0.65	0.28	2.33	0.09	1.20*

Note: SAAAS-C = Competence Subscale from the Scale for Anti-Asian American Stereotypes; SAAAS-S = Sociability Subscale.

* $p \leq .05$ ** $p \leq .01$.

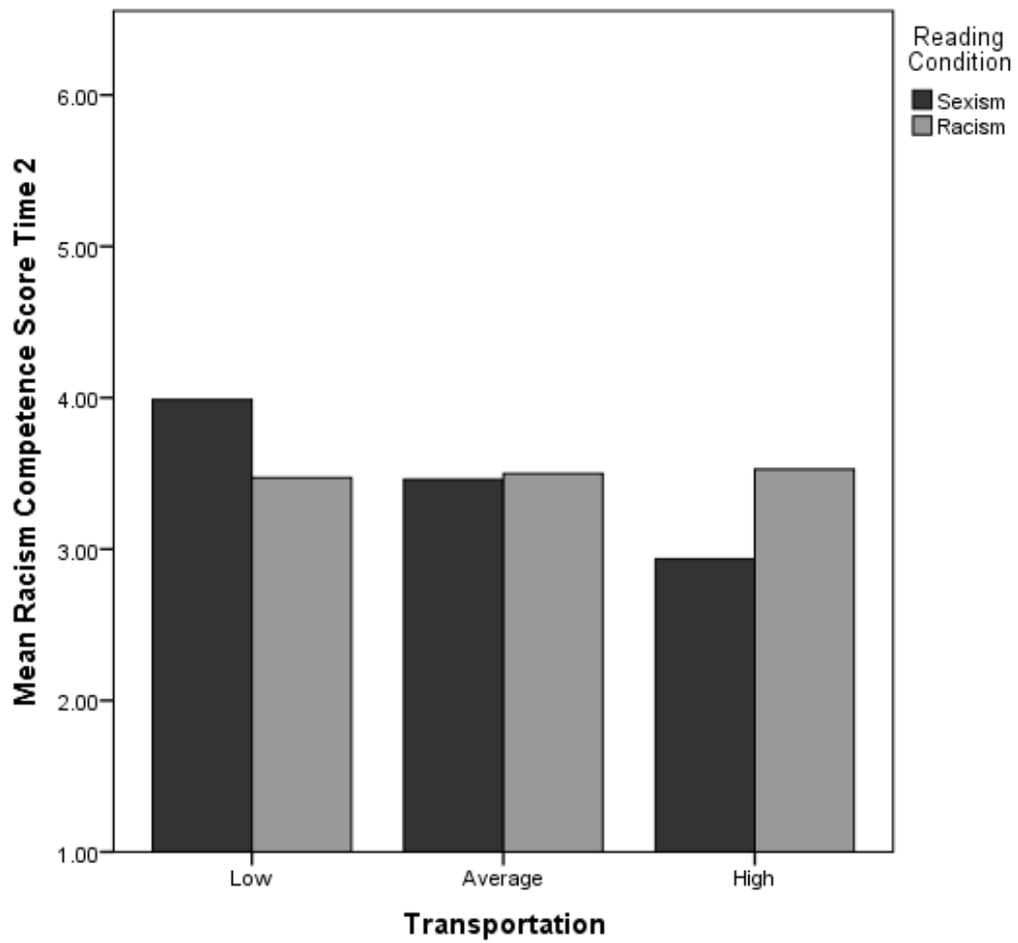


Figure 4.7. Conditional effects of reading condition on racism-competence subscale at time 2, at values of transportation (mean \pm 1 SD)

To compare measures with transportation over time, difference scores were created (by subtracting time 1 from time 2 scores) for sexism and racism measures. These difference scores for racism and sexism were then used as the dependent measures in the PROCESS model to compare transportation and reading condition (as above). Reading condition was a significant predictor for hostile sexism over time, and a significant interaction was seen between transportation and reading condition for hostile sexism difference scores, but not benevolent sexism, and no interaction was seen for racism scores (see Table 4.9). No other effects were found. Conditional effects of transportation scores on reading condition for hostile sexism differences are shown in Figure 4.8. Participant gender did not interact with any of the effects.

Table 4.9

Linear Models of Transportation and Reading Condition as Predictors for Measures of Sexism and Racism over Time

Sexism Difference	Model	<i>b</i>	SE <i>b</i>	<i>t</i>	LLCI	ULCI
Hostile	Transportation	-0.11	0.07	-1.51	-0.26	0.04
	Reading Condition	0.25	0.12	2.03	0.00	0.50*
	Transportation × Condition	0.33	0.15	2.27	0.04	0.63*
Benevolent	Transportation	-0.02	0.08	-0.30	-0.18	0.13
	Reading Condition	-0.12	0.13	-0.91	-0.39	0.15
	Transportation × Condition	0.19	0.16	1.19	-0.13	0.51
SAAAS-S	Transportation	-0.05	0.07	-0.73	-0.20	0.09
	Reading Condition	0.17	0.12	1.36	-0.08	0.41
	Transportation × Condition	-0.03	0.14	-0.20	-0.32	0.26
SAAAS-C	Transportation	0.09	0.09	1.01	-0.09	0.26
	Reading Condition	0.07	0.15	0.47	-0.22	0.36
	Transportation × Condition	0.28	0.17	1.63	-0.06	0.63

Note: SAAAS-C = Competence Subscale from the Scale for Anti-Asian American Stereotypes; SAAAS-S = Sociability Subscale.

* $p \leq .05$.

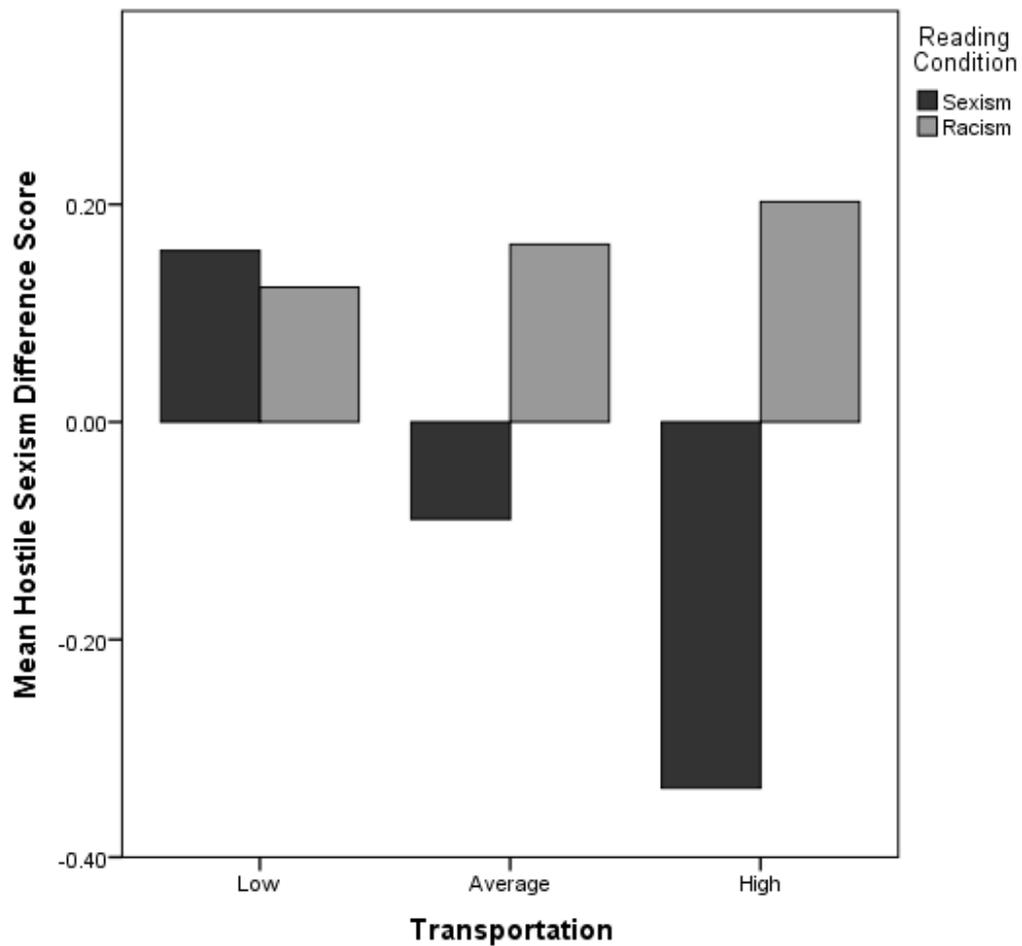


Figure 4.8. Conditional effects of reading condition on change in hostile sexism scores over time, at levels of transportation (mean \pm 1 SD). Negative scores indicate decreasing sexism scores over time.

A J-N technique showed that above 4.3 on the transportation scale, hostile sexism was significantly reduced over time for participants in the sexism condition, compared to the racism condition, $b = .25$, $SE = .12$, $t = 2.00$, $p = .05$, $[-.00, .50]$. Below this value there was no significant association between transportation and reading condition for hostile sexism difference scores.

Discussion

Study 4 was conducted to determine whether the content of fiction specifically affects story-consistent beliefs, or egalitarian attitudes more generally. Comparing sexism and racism reading conditions revealed differences on racism and sexism measures, but not with crossed-over effects as predicted. When examining each measure individually, no interactions were seen between reading conditions and transportation, with the exception of competence racism scores at time 2. At time 2, racism scores decreased with higher transportation, but (perhaps counterintuitively) only for readers in the sexism condition. Evidence of a sleeper effect was found for readers of the sexism condition (but not the racism condition), where highly transported readers reported lower hostile sexism scores over time.

When first considering the results of reading condition at each time point, there was little evidence for reading effects on sexism or racism measures. Transportation only interacted with reading condition for the competence measure of racism; however, the results are only for readers in the sexism condition, where a negative association was found between transportation and the competence racism subscale at time 2. This result might suggest general effects of reading on attitude change, such that a persuasive narrative can affect multiple attitudes, not just those specific to its content. Yet, readers in the sexism condition did not show analogous decreases in sexism scores at either time point (when considered independently). In turn, one would expect highly transported readers to also show lower racism over time in the racism condition. Yet across transportation, no differences in racism scores were found in either reading condition. This may be an aberrant result, and not due to narrative persuasion.

Examining each measure independent of time yielded inconsistent results, yet when comparing measures over time, content-specific effects emerged. For more transported readers in the sexism condition, hostile sexism scores decreased over two weeks; while

readers who were less transported reported increased hostile sexism over time. These results thus do appear to support content effects, as sexism but not racism differed by transportation in the sexism condition. The greater change in sexism scores over time is consistent with sleeper effects that have been documented in other studies of narrative persuasion (Appel & Richter, 2007; Bal & Velkamp, 2013; Bilandzic & Busselle, 2008). Sleeper effects may occur because the original source of the message may be forgotten (Appel & Richter, 2007), or because readers ruminate on or discuss the themes present in the narrative (Bal & Velkamp, 2013). Examining results over time, may therefore aid research to show effects that might otherwise be hidden.

It is surprising that racism did not show an analogous decrease over time for readers in the racism reading condition. One possible interpretation is that editing the original story to create the racism condition (replacing women in the story with “Asian-Americans”) may have made racism more conspicuous to readers, and thus primed participants to respond in a certain way, independent to their level of narrative engagement.

Chapter Summary

In sum, the results of Chapter 4 partially support predictions that fiction, rather than non-fiction, is more important for narrative persuasion, and that the specific content of fiction may also differentially affect attitudes, at least over time. For content, although null or inconsistent effects were initially found when examining results, when comparing results over time, only the relevant gender content resulted in decreased sexism, with no changes for other attitudes (or in other reading conditions).

One limitation consistent across the studies of Chapter 4 is that transportation was measured rather than manipulated, introducing a correlational element into the study designs. The usual problems with correlational designs aside, only using measured transportation makes it difficult to separate the effects of transportation from the effects of reading, as there was some indication that the passages themselves influenced how transported readers

felt.

In conclusion, higher transportation while reading fiction about women was associated with lower sexism scores under certain conditions. In Study 2, higher transportation during reading was associated with lower benevolent sexism when comparing fiction and non-fiction, and lower transportation was associated with higher benevolent and hostile sexism. No content effects were found in Study 2 or 3, but in a more rigorous test, Study 4 showed that hostile sexism decreased over time for more transported readers when they read about sexism, but not about racism. Even so, these studies are still limited in interpretability by the quasi-experimental nature of their design. To address this limitation, transportation was manipulated in Chapter 5.

Chapter 5: Manipulating Transportation

The results of Studies 1 to 4 suggest that reading fiction, but not non-fiction, in a transported state can influence both hostile and benevolent sexism, and that these effects depend to some extent on fiction content. Yet, there may be ambiguities that arise when interpreting the interaction between transportation and reading, due to the quasi-experimental design of the research and the use of transportation as a measured variable. To verify the role of transportation, experimental manipulation of this variable is necessary.

Prior research has attempted to manipulate transportation by changing pre-reading instructions, directing attention during reading, and providing paratextual information (Appel & Malečkar, 2012), with varying degrees of success (a successful manipulation is defined as a change in reported transportation above or below baseline). Moreover, even when manipulations have been successful, their effects on reading-induced attitudes have been inconsistent.

For example, one technique used to manipulate transportation is distraction. As discussed in Chapter 1, cognitive factors such as attention and cognitive load have been theorised to be important components of transportation. Therefore, decreased attention or increased distraction while reading should inhibit transportation. De Graaf et al. (2009) used distraction to manipulate narrative engagement (rather than transportation per se), by adding language errors to readers' texts or asking participants to select sentences from the story that were unsuitable for children's reading levels, as an additional task while reading. Both of these manipulations were predicted to reduce narrative engagement compared to baseline; yet while these manipulations altered attentional focus and feeling of being in the narrative, they did not predict story-consistent attitudes compared to reading the story undisrupted.

Zwarun and Hall (2012, Study 2) used another technique to manipulate distraction. Par-

Participants watched a film about privacy and technology, either while wearing headphones to reduce interruptions, or without headphones and with distracting messages appearing on screen. Participants in the distracted condition reported lower transportation, as well as weaker story-consistent beliefs, but the nature of the relationship between distraction, transportation, and story beliefs was not straightforward. Distraction effects on beliefs were mediated by transportation, such that increased distraction was associated with decreased transportation and beliefs; however, a direct effect of distraction on beliefs was also present and in the opposite direction, meaning that high distraction was actually associated with greater story-consistent beliefs, independent of transportation. The authors argued that high distraction may also decrease reactance to the story, due to the lack of cognitive resources available.

Other researchers have manipulated transportation via pre-reading instructions designed to deplete cognitive resources or to encourage openness and relaxation (Green, 2004). Alternatively, participants may be instructed to focus on different aspects of a narrative that are thought to be more relevant to transportation processes. Sestir and Green (2010), for example, asked participants to view a film either from the perspective of the main character or that of an independent observer (to manipulate identification) and, independently, to focus on story events or the colour scheme (to manipulate transportation). Although transportation can occur without character identification, the two effects often occur together, and so the authors predicted that participants in both high transportation and identification conditions should display greater connection to traits presented for story characters. The instruction manipulations appeared to successfully manipulate transportation independently of identification; however, the effects of transportation were inconsistent.

Other instructional manipulations (Green, 2004; Green & Brock, 2000) have been used with mixed success. Green (2004), for example, gave participants a fictional story about a homosexual man reuniting with his fraternity. Participants were asked to relax, to think

critically about the story, or to read the story with no additional instructions. Although transportation was positively associated with beliefs about homosexuality and fraternities, this association did not differ across reading condition manipulation. Green and Brock (2000) also unsuccessfully manipulated transportation in three studies (using a story about psychiatric patients), through paratextual information (i.e., information outside of the main text or story, such as the story being ‘fiction’ or ‘non-fiction’) or pre-reading instructions designed to decrease or increase transportation. In the first study, presenting the story as fiction or non-fiction had no effect on transportation scores. In the following two studies, to increase transportation, participants were instructed to imagine they were performing the roles of the characters in order to immerse themselves into the story (theatre condition). To decrease transportation, participants were asked to analyse the text for appropriateness for a reader at fourth-grade level, by focusing on surface characteristics such as word difficulty (fourth-grade condition). In the narrative baseline condition, participants were asked to focus their attention on the story while reading. Again, the manipulation had no effect on reported transportation and no effects were found for beliefs about psychiatric patients. However, in a fourth study with a different text (*Two Were Left* by Hugh B. Cave, used in Study 2 of this thesis), transportation and beliefs about friendship were lower after reading in the fourth-grade, compared to the baseline condition (the theatre condition was excluded from this study).

Appel and Malečkar (2012) also attempted to manipulate transportation by describing texts as fiction, non-fiction, or fake. Transportation was successfully manipulated; participants presented with the fake condition reported lower transportation, compared to when the story was presented as fiction or non-fiction (with no difference between these conditions). Moreover, transportation mediated the effects of paratextual information on attitudes, as participants who read the story labelled as fiction reported greater transportation and story-consistent beliefs (about psychiatric patients), compared to when the story was presented as fake.

Suspense has also been used to manipulate transportation. Tal-Or and Cohen (2010) found that transportation was higher when suspense was higher, and both variables were positively related to enjoyment when watching a fictional film. However, beliefs were not assessed in this study. De Graaf and Hustinx (2011) manipulated story structure to provide greater suspense, and the suspenseful story structure did increase transportation scores and story-consistent beliefs. However, the role of transportation in the belief effect was unclear: The effect of transportation as a mediator was inconclusive, as the emotion component of transportation was not a significant mediator of story structure effects on beliefs, and no other subcomponent of transportation was tested; the moderating role of transportation was not considered.

A recent meta-analysis of narrative involvement (including manipulations of transportation, immersion, character identification, spatial presence, and homophily with characters), examined manipulations of transportation (33 effects) across several types of media including television, films, advertisements, short stories, video games, and personal testimonials (Tukachinsky, 2014). Only 36% of the studies reported significant effects as predicted, with over half of the studies finding no differences between experimental conditions. Successful manipulations included distraction (de Graaf et al., 2009; Zwarun & Hall, 2012), perspective-taking (Appel, 2011; Green & Brock, 2000; Escalas, 2004), similarity (de Graaf & Hustinx, 2011), and meta-narrative (i.e., paratextual) information (Appel & Malečkar, 2012). Manipulating literary qualities (such as narrative perspective) showed no significant effect across studies. Across successful manipulations, the effect sizes were similar in range and small in size, (ranging from Cohen's $d = .24$ for similarity, to Cohen's $d = .36$ for meta-narrative manipulations). As this meta-analysis and the results of the above reviewed studies show, transportation is not easily manipulated with existing techniques. Consequently, a novel manipulation was chosen for Study 5, which takes advantage of the imagery component of transportation.

Although rarely used as a manipulation of transportation per se (an exception being Green and Brock's theatre condition, described above) mental imagery has been used successfully to manipulate related constructs. Holmes and Matthews (2005), for example, trained participants to use mental imagery by instructing them to imagine a lemon in a series of steps (mental imagery condition). This condition was compared to a control condition, in which participants were asked to focus on the words and meaning of each description (verbal-semantic condition). Participants were presented with audio descriptions of negative situations (i.e., a fire at work), and assessed on anxiety before and after listening to the descriptions. The imagery condition produced a significant increase in anxiety over time, compared to the control condition. A second study replicated the effect, but failed to find corresponding differences for benign situations (in which the negative situation had a harmless outcome) perhaps, according to the authors, because their anxiety measure was unsuitable to measure positive affective changes. In a similar study, positive situations were read out to participants in imagery and verbal-semantic conditions. However this time, both anxiety and positive affect were measured before and after the tasks (Holmes, Mathews, Dalgleish, & Mackintosh, 2006). For participants in the imagery condition, positive affect increased and anxiety non-significantly decreased over time. Yet in the verbal condition, positive affect decreased over time.

Blair and colleagues (2001) looked at changes in implicit stereotypes with the IAT as a function of mental imagery. To assess implicit gender stereotypes, categories of gendered names (female, male), were paired with "strong" or "weak" words. Participants were also instructed to imagine either a strong woman (counter-stereotype condition) or a vacation in the Caribbean (control condition). Compared to controls, participants in the counter-stereotype condition showed stronger relative associations between female names and strength. In follow-up studies, these results were replicated with the addition of a no-imagery condition, and a condition in which participants imagined a weak woman. In all conditions, the incongruent blocks were slower than the congruent blocks; however, this

difference was smallest for the counter-stereotype imagery condition. In contrast, imagining a stereotypical “delicate” woman increased the relative association between women and weakness. No association was found when imaging a stereotype other than the one tested, indicating that mental imagery had to be relevant (i.e., imagining a delicate woman influences implicit beliefs about delicacy, but imagining an insecure woman, another type of “weak woman”, does not). The authors argued that mental imagery can influence the accessibility of conceptual representations, which in turn could help promote attitude change. Although not assessed in this study, transportation may be one mechanism through which such effects occurred.

In a more recent study, Johnson, Cushman, et al. (2013) found that mental imagery training increased prosocial behaviour, compared to verbal-semantic training or leisure reading. A fiction story designed to elicit empathy was used, and prosocial behaviour was assessed by asking participants at the end of the study to complete an additional survey, even though the payment for the survey would be small (5 cents). The imagery condition did show higher transportation compared to other conditions, and readers who generated mental imagery were more likely to show prosocial behaviour. Participants in the verbal-semantic condition (which should decrease transportation) showed similar levels to the leisure reading condition. Transportation mediated the effect of imagery condition on empathy and prosocial behaviour. These findings support the use of transportation manipulations; however, Johnson and colleagues did not control for fiction versus non-fiction reading, so the actual impact of manipulated transportation after reading fiction is unclear.

The above results suggest that mental imagery may be a useful tool for manipulating transportation. In addition, another advantage of mental imagery over manipulations such as distraction and instruction sets, are that imagery provides the opportunity to *increase* transportation (as shown by Johnson, Cushman, et al., 2013). Most manipulations of transportation decrease transportation below baseline, and manipulations that have increased

transportation (such as suspense), have led to inconclusive results. Increasing transportation would also help to avoid potential confounds inherent in some transportation manipulations. For example, many studies that decrease transportation use methods such as distraction (i.e., Zwarun & Hall, 2012; de Graaf et al., 2009). Participants may not only struggle with becoming transported under such conditions, but may also become more frustrated or bored while trying to complete the experimental reading with the additional task demands. As boredom has been linked to increased counterarguing (Cacioppo & Petty, 1979), an unintended consequence of these manipulations may be decreased story-consistent beliefs, but not because of transportation effects.

In the previous studies conducted for this thesis, while transportation appears to play a role in the relation between sexism and reading, transportation was not manipulated. Therefore, in Study 5, transportation was manipulated by increasing mental imagery (mental imagery training; Holmes et al., 2008) compared to baseline. As transportation has been difficult to manipulate in similar studies, this novel mental imagery manipulation was selected. Mental imagery is theoretically a main component of transportation processes (as argued for Transportation-Imagery Theory by Green & Brock, 2002), yet has not received much investigation in the context of reading effects. As an additional comparison, another condition was added where participants were asked to focus on surface text elements (fourth-grade condition; Green & Brock, 2000), in order to decrease transportation. Finally, a baseline condition was also included where no additional instructions were given. All three conditions (control, fourth-grade, and mental imagery conditions) were also compared between fiction and non-fiction reading conditions.

I predicted, first, that participants would report greater transportation in the mental imagery condition, compared to the control and fourth-grade conditions. These effects were predicted to occur after reading fiction, compared to non-fiction. Second, I predicted that transportation would mediate the relation between mental imagery and beliefs, for

readers in the fiction condition.

Study 5

Method

Participants

Participants were 440 Mechanical Turk workers. They were given 50 cents for survey completion. Participants included 235 females, 204 males, and one participant who identified as other. Participants' age ranged from 18 to 79 years.

Materials

Transportation was manipulated via tasks presented prior to reading. In the mental imagery condition, adapted from Holmes and Matthews (2005), participants received a mental imagery training task in which they imagined a lemon in a series of steps (e.g. "Imagine holding a lemon", and "now imagine shining a light on the lemon and looking at its skin"), and rated the vividness of their imagery in each one (see Appendix L). In the fourth-grade condition, adapted from Green and Brock (2000), participants were told to focus on surface elements of the reading (i.e., word length) they were to be given as part of the study. Participants were instructed that they would be analysing the text for appropriateness for adults who read at a fourth-grade level (see Appendix M). In the control condition, no additional instructions were given to participants before reading.

As a manipulation check for the imagery training, participants in all conditions completed a short exercise, in which they were asked to imagine someone they saw regularly:

"For the following question, close your eyes and try to visualize a relative or friend whom you frequently see. Picture the exact contour of their face, head, shoulders, and body. Picture the way they carry themselves, the way they move their head and their body, and the way they walk. Picture the colour

and texture of the clothes they wear.”

Participants rated how vividly they imagined the person on a scale of 1 (not at all vividly) to 5 (extremely vividly). This question was adapted from the Vividness of Visual Imagery Questionnaire – Revised (VVIQR; Marks, 1995).

Participants were also given the same reading materials as previous studies, including the non-sexism chapter of *The Handmaid’s Tale* (used as a control for Study 3), *Two Were Left*, and *Musical Firsts* (non-fiction). As with previous studies, participants completed the IRI, ASI, Identification Scale¹, Transportation Scale, and questions about reading.

Procedure

The procedure was identical to those of previous studies with the exception of the transportation manipulations and vividness question. These were presented immediately before reading (for the baseline condition, only the vividness question was presented).

Results

As in Study 2, initial analyses combined the two fiction conditions into one for comparison with the non-fiction group (preliminary analysis showed no difference between the two fiction conditions). Descriptive statistics within experimental conditions are presented in Table 5.1.

¹ The Identification Scale (Cohen, 2001) was included in the questionnaire out of interest, however, was not used in analyses.

Table 5.1

Descriptive Statistics for Reading and Experimental Conditions

	Mental Imagery Training				Baseline				Fourth-Grade			
	F		N-F		F		N-F		F		N-F	
	<i>n</i> = 96		<i>n</i> = 47		<i>n</i> = 90		<i>n</i> = 65		<i>n</i> = 100		<i>n</i> = 41	
	Mean	SD	Mean	SD	Mean	SD	Mean	SD	Mean	SD	Mean	SD
Vividness	3.91	0.87	3.94	0.99	3.83	0.86	3.94	0.79	3.91	0.84	3.61	0.92
IRI	3.25	0.52	3.31	0.57	3.33	0.54	3.35	0.53	3.34	0.45	3.27	0.65
Transportation	4.55	1.14	4.13	1.02	4.76	0.90	4.18	0.93	4.61	0.95	4.04	1.04
Identification	5.01	1.37	4.03	1.45	5.31	1.18	4.49	1.29	5.14	1.23	4.34	1.34
Hostile Sexism	3.06	1.10	2.81	1.24	2.79	1.28	2.70	1.11	2.82	1.15	2.51	1.19
Benevolent Sexism	3.35	1.10	2.96	1.12	2.92	1.14	3.16	1.21	3.26	1.10	3.15	1.04
Reading	4.29	1.66	4.07	1.63	4.40	1.59	4.55	1.57	4.18	1.58	4.12	1.46

Note: F = Fiction; N-F = Non-Fiction; IRI = Interpersonal Reactivity Index.

To determine whether imagery training was successful, vividness scores were compared across imagery conditions using a one-way ANOVA. There was no effect of the imagery manipulation, however, $F(2, 438) = 0.15$, $p = .87$, $\eta^2 < .01$. The effectiveness of the manipulation on transportation itself was tested in a 3 (imagery condition) x 2 (reading condition) ANOVA on self-reported transportation. A main effect for reading condition was found, $F(1, 439) = 26.92$, $p < .001$, $\eta^2 = .10$, such that participants in the fiction condition (Mean = 4.64, SD = 1.01) reported higher transportation compared to those in the non-fiction condition (Mean = 4.12, SD = 0.98). There was no main effect for imagery condition, however, $F(2, 439) = 0.88$, $p = .42$, $\eta^2 < .01$, nor an interaction,

$F(2, 439) = 0.26, p = .77, \eta^2 < .01$.

To assess condition effects on sexism, a 3 (imagery condition) x 2 (reading condition) ANOVA was conducted for hostile and benevolent sexism scores. For hostile sexism, there was a marginally significant main effect of reading, $F(1, 439) = 3.24, p = .07, \eta^2 = .01$, with fiction reading showing higher hostile sexism (Mean = 2.89, SD = 1.18) compared to non-fiction (Mean = 2.68, SD = 1.17). There was no main effect for imagery condition, $F(2, 439) = 1.66, p = .19, \eta^2 = .01$, nor interaction, $F(2, 439) = 0.32, p = .73, \eta^2 < .01$.

For benevolent sexism, there was no main effect of reading condition, $F(1, 439) = 0.53, p = .47, \eta^2 < .01$, or imagery condition, $F(2, 439) = 0.76, p = .47, \eta^2 < .01$; however a marginally significant interaction was found, $F(2, 439) = 2.80, p = .06, \eta^2 = .01$ (see Figure 5.1). To explore this interaction, independent samples t-tests were conducted between fiction and non-fiction conditions, for each imagery condition. No difference was found between fiction and non-fiction conditions for the baseline condition, $t(153) = -1.29, p = .20, 95\% \text{ CI } [-0.62, 0.13]$, or for fourth-grade condition, $t(140) = -0.51, p = .61, 95\% \text{ CI } [-0.29, 0.50]$; however, a significant difference was observed between reading conditions, with fiction showing higher benevolent sexism scores compared to non-fiction for the mental imagery condition, $t(141) = 1.98, p = .05, 95\% \text{ CI } [0.00, 0.78]$.

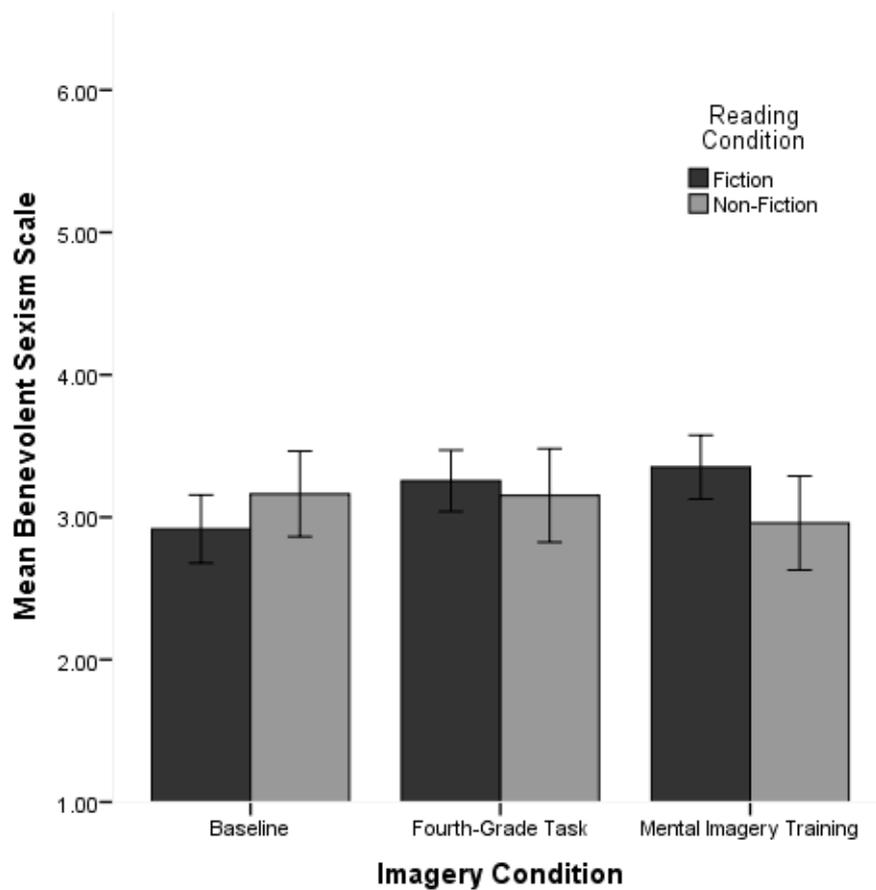


Figure 5.1. Mean benevolent sexism scores as a function of imagery and reading conditions. Errorbars = 95% CI

To determine whether the effect of imagery condition on sexism was explained by transportation, imagery condition (recoded dummy variables with mental imagery training = 1, and fourth-grade and baseline = 0) was compared to transportation using multiple regression analysis in Hayes' (2013) PROCESS macro (model 4) for mediation (see Figure 5.2 for conceptual model), for the fiction reading condition. Transportation was included as a mediator variable; imagery condition as an independent variable, and benevolent sexism was the dependent variable. Bias-corrected bootstrap analyses based on 5000 bootstrap samples were run (see Table 5.2).

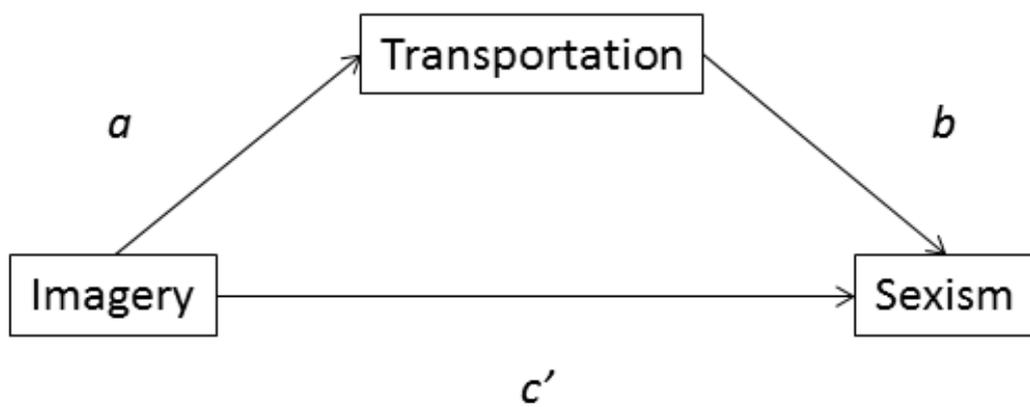


Figure 5.2. Conceptual model of the mediation analysis.

Table 5.2

Bootstrapped Results for Mediation Analyses on Imagery Condition and Transportation, on Benevolent Sexism

		<i>b</i>	SE	LLCI	ULCI
Benevolent Sexism	a	-0.13	0.13	-0.38	0.12
	b	0.07	0.07	-0.07	0.20
	c'	0.26	0.14	-0.01	0.54*
	ab	-0.01	0.02	-0.06	0.01

Note: LLCI and ULCI represent 95% confidence intervals.

* $p < .10$.

Imagery showed no effect on transportation (*a*), and transportation had no effect on sexism (*b*). Transportation showed no mediation (*ab*) of imagery condition and sexism; however, as expected from the above results, there was a marginal direct effect of imagery condition on benevolent sexism (*c'*).

Discussion

The purpose of Study 5 was to test a novel manipulation of transportation that has been used previously in studies of mental imagery, emotion, and empathy (Holmes & Mathews, 2005); yet, mental imagery training showed no effects on transportation. It was also predicted that participants who were given mental imagery training would show lower sexism via transportation, compared to control conditions. However, mental imagery training was associated with increased benevolent sexism, and this effect was not mediated by transportation. In turn, these effects occurred for readers of fiction, rather than non-fiction.

Transportation has been notoriously difficult to manipulate, with prior research finding many null or inconsistent results. Mental imagery was chosen as a method of manipulating transportation due to the links to Transportation Theory, but also because it was predicted to increase transportation, avoiding confounds that may be associated with manipulations to lower transportation. Yet mental imagery had no effect on reported transportation.

Although transportation was unrelated to mental imagery, mental imagery training still influenced sexism scores, but unexpectedly, in the opposite direction to that predicted. However, as the manipulation checks for imagery failed to show any differences, this result was also not likely due to mental imagery. Benevolent sexism stems from positive evaluation of traditional female stereotypes, and typically increases with perceived gender differences (Zell et al., 2016). One possible interpretation of the Study 5 results is that mental imagery increased reliance on gender stereotypes. Mental imagery may improve mood especially if the scenarios imagined are positive (Holmes et al., 2006), and positive mood has been shown to increase stereotyped thinking (Park & Banaji, 2000). However, as mood was not measured in this study, this account cannot be verified directly.

Another potential interpretation is that in trying to increase transportation through mental imagery, the task may have ironically contained the same issues as those proposed above for manipulations to lower transportation. Although mental imagery is a proposed process of transportation, asking participants to focus on mental imagery before reading may have interfered with participants' ability to be transported due to the extra cognitive effort the imagery task required. If the mental imagery task did in fact decrease the cognitive resources available for reading and transportation, then this may have increased factors like boredom, and therefore, also increased reactance and counterarguing to the story, leading to higher sexism scores.

In summary, the mental imagery training did influence sexism; however, this was not due to manipulating transportation, and results were in the opposite direction to those predicted. Imagery, however, is still worth examination. As the effects of the manipulation check failed to show effects on both transportation and vividness, it is possible that the results are due to confounds speculated above, and mental imagery processes are not responsible. To address these limitations, a less intrusive manipulation that is able to be implemented during reading, but also uses imagery, would be a beneficial next step. There-

fore, it was proposed in Study 6 that pictures accompanying the text may provide a medium through which to achieve this.

Study 6

The Study 5 manipulations of imagery did influence beliefs; however, these results were not due to successful manipulations of transportation. As a consequence, Study 6 was designed as another attempt to manipulate transportation, also using imagery components by providing visual aids with the story, compared to story only. The visual aid meant that participants were not required to perform additional tasks while reading, addressing a potential confound of Study 5.

Whether self-generated imagery or presented imagery is better at encouraging transportation is a contentious issue (Green et al., 2008). The most relevant research comes from the few studies comparing story mediums (such as print versus film) for transportation effects. For example, Green et al. (2008) found that story medium had no effect on transportation. Yet in a second study, the authors found that individual differences, such as need for cognition, predicted whether participants were more transported into a film versus print. Participants with lower need for cognition reported higher transportation when viewing films compared to reading, whereas participants with higher need for cognition reported higher transportation when reading compared to film watching. The authors argued that physical pictures may help transport participants who find it difficult to generate their own mental imagery. However, in a meta-analysis of transportation and story-consistent beliefs, Braddock and Dillon (2016) did not find evidence for medium effects (between film, text, audio, and theatre presentations) on narrative transportation.

Other research also suggests that presenting images with texts might aid the formation of mental imagery and improve measures associated with reading. For example, research on children's understanding of narrative has shown that children are better able to learn stories that have pictures accompanying them (Levin & Lesgold, 1978). Gambrell and Jawitz

(1993) gave children a story with or without illustrations. Participants were instructed to use mental imagery, to attend to the illustrations, or simply to pay attention to the text (as a control). Both mental imagery and illustration were associated with improved recall of the story compared to the control group, however, children in the combined imagery and illustration group showed superior performance compared to all other conditions. These effects are theorised to be due to increased attention, and the fact that images help make the information more concrete for the reader (Levin, 1989).

Illustration may also improve attention and understanding in adult samples. Research into adult reading and learning suggests that images can aid understanding of complex concepts (Alesandrini, 1984), and mental representation (Petrova & Cialdini, 2008) for expository texts and advertising. Anglin (1987) found that giving adults line drawings with text articles improved recall of presented information.

It is important to note though, that the use of pictures can be detrimental in some contexts. Too much “vividness” can be detrimental for non-narrative persuasion, especially when more cognitive resources are available to process the information (Keller & Block, 1997). However, Escalas, (2004) argued that narrative is not constrained by having “too much” vividness as other text types might be, and certainly films, video games, and television rely heavily on concrete images. In addition, this appears to be at odds with Transportation Theory, as reducing resource allocation (i.e., through distraction) has been shown to decrease the effects of narrative persuasion.

In Study 6, transportation was manipulated via the inclusion of a story-relevant image. To simplify its design and remove between-story confounds, Study 6 used only one story, which was accompanied by a picture of one of the characters, a picture of a landscape without the character, or no picture. Although both pictures were related to the story, there are several reasons to believe that the image of the character will facilitate transportation to a greater extent. First, human cognition is sensitive to the presence of agency (Mar,

Kelley, Heatherton, & Macrae, 2007), and so the picture of the character should attract more attention compared to the landscape. As attention is associated with transportation, increased attention should also increase transportation (Green & Brock, 2000; Zwarun & Hall, 2012). Second, the picture of a character should convey greater social meaning than that of the story setting. Increased social cues should also increase attention (Tavares, Lawrence, & Barnard, 2008), and perspective-taking (Moll et al., 2007), as perspective-taking is an important component of social interaction (Galinsky, Ku, & Wang, 2005). In turn, perspective taking and empathy have been linked to transportation (Green & Brock, 2002), and prior studies have used perspective-taking instructions to attempt to increase transportation (Tukachinsky, 2014). Thus, it was predicted that participants who read the story accompanied by an image of a character would report greater transportation. In turn, these participants were predicted to show lower levels of sexism, compared to the control conditions.

In addition, relevant images have been shown to increase persuasion in other contexts. When pairing photos of celebrities with statements claiming the celebrity was alive or dead, participants were more likely to agree with the statements, compared to when no photo was attached (Newman, Garry, Bernstein, Kantner, & Lindsay, 2012). The authors argued this was due to the increased perception of familiarity that the photo may provide the message receiver. Familiarity with story themes has been shown to increase transportation (Green, 2004), and so providing a relevant, albeit uninformative, image with a story should increase transportation.

While Study 5 was not successful in manipulating transportation, imagery did lead to belief change in the fiction condition. Therefore, in Study 6 only fiction readings were used. In addition, to reintroduce gender content (which was not present in Study 5), the gender of the main character was also manipulated, so that the main character was either a boy or a girl. It was predicted that readers given the character image with the story would

show the lowest sexism scores due to increased transportation, especially for readers of the girl condition compared to the boy condition.

Method

Participants

Participants were 302 MTurk workers, who were paid 50 cents each. Of this sample, 149 were male, 151 female, and 2 participants who identified as other. Participants' age ranged from 18 to 76 years.

Materials and Procedure

This study was identical to previous studies, with the following exceptions. First, all participants read *Two Were Left*, as described in Study 2. Second, two images were selected from public domain websites to depict a dog and an icy landscape, respectively, to be presented with the story. Pictures were selected to be realistic and relevant (i.e., plausible dog breed and setting). Images were placed in the background of the story as a watermark, and also appeared as a clear image in the top left corner of the page (see Figure 5.3 for picture examples, and Appendix N for full image and text pages).

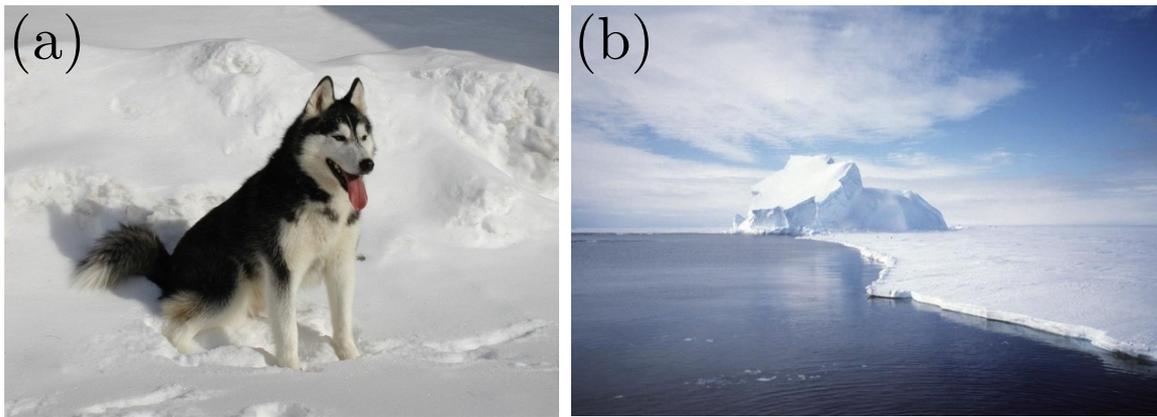


Figure 5.3. Images used for image conditions including: (a) character-relevant image and (b) setting-relevant (no character) image.

Third, gender was manipulated by creating a second version of the story in which all references to the main character's gender (male in the original story) were changed to female. The structure and content of this story permitted these changes without corresponding changes to the meaning.

Fourth, additional manipulation and attention checks were included. To check readers' attention to the story, participants were asked the gender of the main character ('male', 'female', or 'I don't remember'), and what picture participants saw with the story ('a dog', 'an ice landscape', 'a knife', 'an airplane', 'no image', or 'I don't remember',). The Transportability Scale was also given to participants, though was not included in the analyses.

Results

Descriptive statistics are presented in Table 5.3. Two participants reported that they did not finish reading the text and so were excluded from analyses, reducing the sample to 300 participants.

Table 5.3

Descriptive Statistics for Dependent measures For Gender and Image Conditions

	Gender Condition: Girl					
	Character $n = 53$		No Character $n = 47$		No Image $n = 49$	
	Mean	SD	Mean	SD	Mean	SD
IRI	3.35	0.47	3.28	0.48	3.23	0.57
Transportation	4.97	0.87	4.91	0.80	4.86	0.92
Identification	5.44	1.23	5.32	1.15	5.08	1.26
Hostile Sexism	2.68	1.15	2.93	1.17	3.09	0.93
Benevolent Sexism	3.04	1.04	3.27	1.25	3.47	1.05
Reading	4.08	1.73	4.46	1.72	3.96	1.63

	Gender Condition: Boy					
	Character $n = 52$		No Character $n = 52$		No Image $n = 49$	
	Mean	SD	Mean	SD	Mean	SD
IRI	3.47	0.43	3.36	0.57	3.25	0.50
Transportation	4.94	0.85	5.05	0.88	4.93	0.79
Identification	5.47	1.09	5.64	1.15	5.45	1.12
Hostile Sexism	2.56	1.12	2.84	1.17	2.86	1.39
Benevolent Sexism	3.31	1.21	3.05	1.12	3.01	1.26
Reading	4.11	1.75	4.31	1.41	4.14	1.66

Note: IRI = Interpersonal Reactivity Index.

Most participants correctly recalled the gender of the character in their story, and accuracy did not differ by condition (92% correct in female condition, 93% correct in male condition). For the image check, the majority of participants overall recalled the correct image (if any) presented with the text, however, this differed by condition. For the character condition, 76% of participants correctly remembered the image, 93% correctly recalled the no character image, and 69% correctly recalled that no image was presented with the story. Yet adding this item as a covariate did not change any of the results. Therefore, these participants remained in the sample for analyses, to maintain study power.

As a manipulation check, a 3 (image: character, no character, no image) x 2 (gender: girl, boy) ANOVA was conducted to assess the effect of condition on transportation. No main effects of image, $F(2, 299) = 0.26$, $p = .77$, $\eta^2 < .01$, or gender, $F(1, 299) = 0.36$, $p = .55$, $\eta^2 < .01$, were found, nor was there a significant interaction, $F(2, 299) = 0.27$, $p = .76$, $\eta^2 < .01$.

For the main analysis, a 3 (image: character, no character, no image) x 2 (gender: girl, boy) ANOVA was conducted for hostile and benevolent sexism. For hostile sexism, there a marginally significant main effect for image, $F(2, 299) = 2.56$, $p = .08$, $\eta^2 = .02$, where the character condition showed lower sexism (Mean = 2.62, SD = 1.13) compared to the no character (Mean = 2.88, SD = 1.16) and baseline conditions (Mean = 2.98, SD = 1.18). There was no main effect for gender, $F(1, 299) = 1.19$, $p = .28$, $\eta^2 < .01$, nor an interaction, $F(2, 299) = 0.11$, $p = .90$, $\eta^2 < .01$.

For benevolent sexism, there were no main effects for image, $F(2, 299) = 1.35$, $p = .87$, $\eta^2 < .01$, or gender, $F(1, 299) = 1.10$, $p = .31$, $\eta^2 < .01$, but there was a marginally significant interaction, $F(2, 299) = 2.69$, $p = .07$, $\eta^2 = .02$ (see Figure 5.4)². To probe this interaction, one-way ANOVAs were used to compare across imagery condition for

²Participant gender did not interact with image or character gender conditions for sexism ratings. When excluding participants who did not correctly identify the character gender, the interaction became non-significant, $F(2, 276) = 3.03$, $p = .16$, $\eta^2 = .02$, however, the pattern of results remained the same between conditions.

both girl and boy reading conditions. Imagery condition was not different for the girl condition, $F(2, 145) = 1.96, p = .15$, or boy condition, $F(2, 149) = 0.95, p = .39$. Planned contrasts for the girl condition, however, revealed that the character image (marginally) decreased benevolent sexism compared to both no character image or baseline, $t(112.64) = -1.81, p = .07$, but baseline was not significantly different compared to no character image condition, $t(89.97) = -0.84, p = .40$. For the boy condition, planned contrasts revealed no differences between character condition and the other two conditions, $t(97.90) = 1.36, p = .18$, nor were baseline and no character image conditions significantly different, $t(96.07) = 0.17, p = .87$.

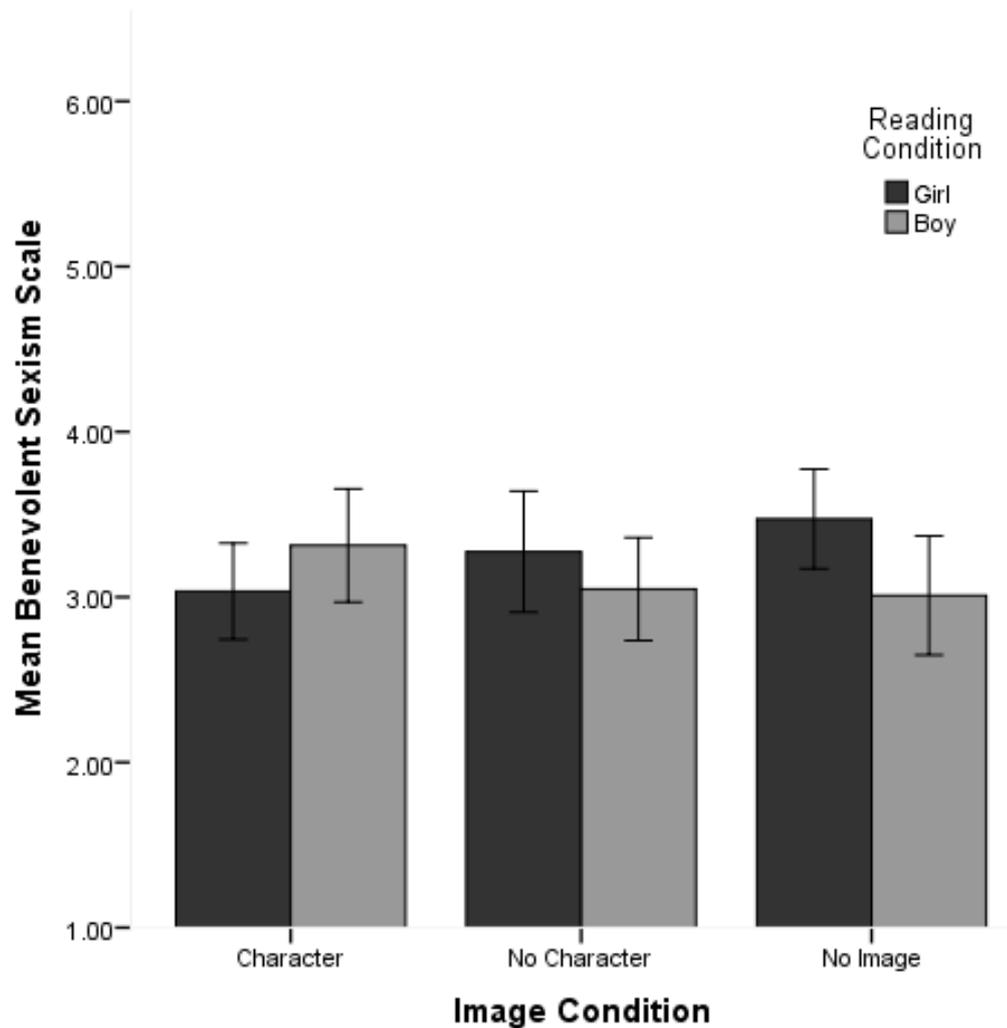


Figure 5.4. Benevolent sexism scores as a function of image and protagonist gender condition. Error bars are 95% CI

To determine whether the effect of imagery condition on sexism was explained by transportation, imagery condition (with character condition coded as 1, no character as 0, and baseline as -1) was compared to transportation using Hayes' (2013) PROCESS macro (model 4) for mediation, for the girl reading condition. Transportation was included as a mediator variable; imagery condition as an independent variable, and benevolent sexism was the dependent variable. Bias-corrected bootstrap analyses based on 5000 bootstrap samples were run (see Table 5.4).

Table 5.4

Bootstrapped Results for Mediation Analyses on Imagery Condition and Transportation, on Benevolent Sexism

		<i>b</i>	SE	LLCI	ULCI
Benevolent Sexism	a	0.06	0.09	-0.13	0.23
	b	0.05	0.11	-0.13	0.26
	c'	-0.22	0.11	-0.44	-0.003*
	ab	0.003	0.01	-0.01	0.06

Note: LLCI and ULCI represent 95% confidence intervals.

* $p \leq .05$.

Imagery showed no effect on transportation (*a*), and transportation had no effect on sexism (*b*). Transportation showed no mediation (*ab*) of imagery condition and sexism; however, as expected from the above results, there was a direct effect of imagery condition on benevolent sexism (*c'*).

Discussion

In Study 6, to manipulate transportation, stories were accompanied by character- and setting-relevant imagery. In addition, character gender was manipulated to see whether the gender of the protagonist would alter ratings of sexism. While a marginally significant interaction was found between imagery and gender conditions for benevolent sexism scores, these effects were not due to transportation.

In both studies, transportation was not the cause of imagery effects on sexism. Presenting images with the story in Study 6 should have avoided the potential issues that were present in the Study 5 instructional manipulations, as well as the noise introduced by individual differences in mental imagery ability. However, the manipulations in Study

6 were no more successful in changing reported transportation. As imagery is an integral part of Transportation-Imagery Theory (Green & Brock, 2002) it is surprising that these variables were not related. Instead of transportation and imagery being compatible processes for narrative persuasion, perhaps both processes work to increase story-consistent beliefs but through different mechanisms. Indeed, de Graaf et al. (2009) offered a similar argument, after comparing different methods of distraction for narrative engagement. The authors used several scales, and although they were not successful in manipulating beliefs, they did show that their different distraction manipulations changed different aspects of narrative engagement. In fact, the authors went so far as to say that transportation and attention are independent processes, in direct contradiction to Green and Brock's (2000) Transportation Theory.

While apparently ineffective in inducing transportation, imagery did interact with character gender to influence benevolent sexism scores. When the main character was female, presenting images with the story decreased the level of benevolent sexism compared to when no image was presented. Unlike Study 5, the imagery condition reduced sexist evaluations, indicating that this manipulation may have been more successful in manipulating imagery processes. However, as there were no manipulations checks (aside from transportation) to determine how this effect occurred, it may only be speculated. As argued above, the images had the potential to increase readers' attention to the characters and settings, and their feeling of familiarity, yet these factors are also theoretically associated with increased transportation (i.e., Green, 2004; Bezdek & Gerrig, 2016), and transportation was not associated with imagery condition. That the decrease in sexism was seen specifically after reading about a female protagonist, rather than a male protagonist, may provide some clues. While Chapter 4 showed that fiction (compared to non-fiction) tends to drive effects, some effect of fiction content was also found. However, these effects were small and linked to explicit portrayals of sexism, which was not present in Study 6. Aside from increased familiarity and attention, imagery may have also increased creativity. Mental imagery is

positively associated with creative thinking in experimental studies (LeBoutillier & Marks, 2003), and in another study, priming participants to “think different” (i.e., creatively) resulted in overall decreases in stereotyping compared to when participants were primed for “thoughtfulness” (Sassenberg & Moskowitz, 2005). Following this logic, one consequence of imagery in the current study might be that participants relied less on heuristic, stereotyped evaluations, leading to reduced benevolent sexism scores for readers of the girl condition, but not the boy condition, when imagery is also present.

In summary, although imagery manipulations across two studies (Studies 5 and 6) appeared to influence sexism scores after reading, there was little evidence that the effects were related to transportation. Aside from the empirical conclusion that transportation is difficult to manipulate, the results also highlight the ambiguity surrounding the proposed processes involved in transportation. While it is outside the bounds of this thesis to examine all theoretical processes involved in transportation, other methods may be used in order to better understand how transportation may facilitate reading effects. Unobtrusive in vivo methods, such as heart rate measures, may help inform researchers as to the effects of being transported into fiction, and the subsequent effects on sexism. This relation between transportation, physiology, and sexism was examined in Study 7.

Chapter 6: Physiology of reading

Studies 1 to 6 demonstrated that fiction reading is associated with sexism, in both chronic and acute reading contexts. Transportation moderated this association in the laboratory in Studies 2 and 4, with fiction reading associated with lower sexism among highly transported readers. In theory, the interaction was due to the narrative components of fiction, as well as explicit sexism content, under the conditions of transportation. However, due to using measured transportation, strong causal conclusions are not warranted. In Study 5 and 6, I attempted to manipulate transportation directly via imagery, but although these manipulations affected sexism, they failed to affect transportation. Failure to manipulate transportation, as well as other potential confounding factors (such as distraction and mood), help demonstrate the complex and complicated nature of transportation. That imagery manipulations affected sexism without affecting transportation also highlights arguments that these proposed processes may work independently, to facilitate narrative effects on attitudes. More work is needed to understand how transportation actually facilitates the effects of fiction reading on beliefs.

In addition to self-reported subjective experience, another approach to understanding how transportation might enhance reading effects, is to consider the physiological changes of readers who report being transported. Van Laer et al. (2014) have argued that transported readers lose track of reality in a physiological sense, meaning that they experience the narrative (i.e., show increased arousal and emotion) as if the story were really happening to them. Emotional arousal has physiological correlates with, for example, heart rate and heart rate variability (Ekman, Levenson, & Friesen, 1983; Prkachin, Williams-avery, Zwaal, & Mills, 1999), as does mental imagery (Lang, 1979) and attention (Thayer, Hansen, Saus-rose, & Johnsen, 2009), both processes associated with transportation. Thus, one simple way to explore and validate individuals' transportation reports is to examine their cardiovascular activity.

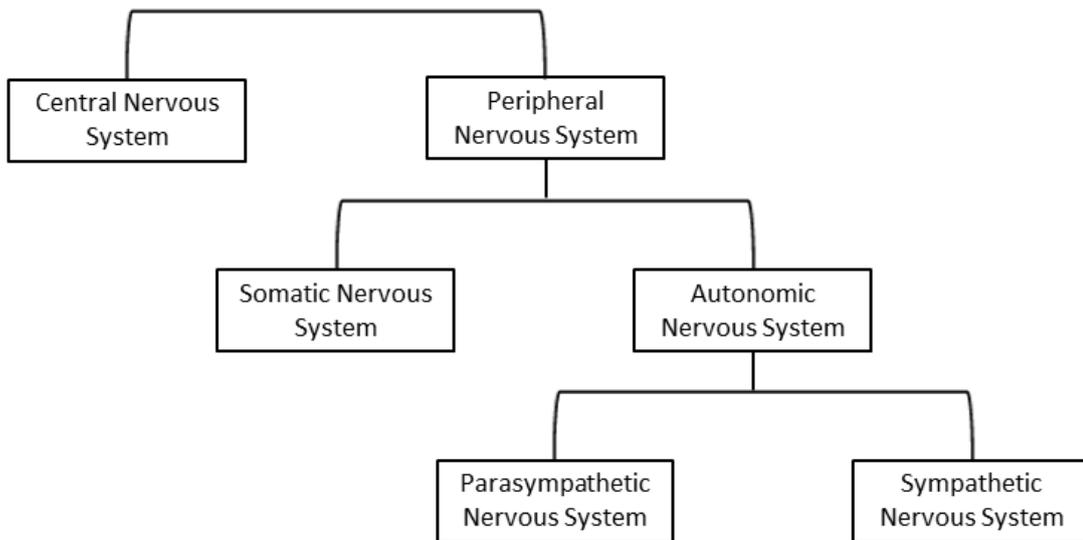


Figure 6.1. Pictorial representation of the nervous system hierarchy. The autonomic nervous system (ANS), and specifically the sympathetic nervous system (SNS), are presented as branches of the nervous system that will influence physiological responses such as heart rate.

The human nervous system is organised hierarchically (see Figure 6.1). The central nervous system consists of the brain and spinal cord, while nerves connecting body parts (or processes) to the central nervous system are called the peripheral nervous system. The peripheral nervous system in turn consists of the somatic nervous system and the autonomic nervous system (ANS). While the somatic nervous system controls voluntary movements, the ANS controls mostly unconscious internal functions such as cardiovascular (Sztajzel, 2004) and sweat gland activity (Critchley, 2002). These functions are evident in physiological responses such as blood pressure, heart rate, heart rate variability (the variation in time between consecutive heart beats), skin temperature, and skin conductance.

The ANS, in turn, has two main divisions called the parasympathetic nervous system (PNS), which controls digestion and rest, and the sympathetic nervous system (SNS), which is associated with the “fight or flight” response that readies the body for motion

(Critchley, 2002). These two systems work in a balance, with higher parasympathetic activity associated with lower sympathetic activity (and vice versa). However, this is not a perfect opposition of systems, as SNS and PNS can work independently to some degree (Shaffer, McCraty, & Zerr, 2014) in order to appropriately control autonomic nervous system functions (Furness, 2006). As these systems respond to stress¹, exercise, and disease (Rajendra Acharya, Paul Joseph, Kannathal, Lim, & Suri, 2006), there are measurable responses (i.e., heart rate) that can be collected and analysed in response to stimuli (Rajendra Acharya et al., 2006).

An ANS stress response is easily understood in the case of physical threat (e.g., heart rate will increase in preparation for running or fighting when encountering a dangerous animal). Yet, while present-day humans may be exposed to fewer wild animals in day-to-day activity, ANS arousal may be activated by *psychological* stress, which may be elicited by a host of social and cognitive processes. Therefore, emotions, attention, and other higher cognitive processes — even when implicit or unconscious — may then also vary with ANS activity (Critchley, 2002; Kreibig, 2010). These responses may be measured by indicators of ANS activity, including most commonly, heart rate and heart rate variability, but also skin conductance and skin temperature, among others. Of these, heart rate variability is probably the most interpretable measure, because although heart rate and heart rate variability are inversely related (as heart rate variability is mostly dependent on heart rate; Monfredi et al., 2014) heart rate is also controlled by the circulatory system (Rajendra Acharya et al., 2006), and so may not always accurately represent nervous system changes. Heart rate variability is a widely reported physiological response, and shows consistent effects in medical investigation (Pumprla, Howorka, Groves, Chester, & Nolan, 2002), as well as cognitive performance (Thayer et al., 2009) and emotional responding (Prkachin et al., 1999).

¹It is worth noting that the term “stress” here means stress in the biological sense; disruption in the body’s internal balance (homeostasis; for discussion see Koolhaas et al., 2011), not necessarily “stress” as a tense or anxious mental state.

Transportation Theory (Green & Brock, 2000) argues that narrative engagement is associated with imagery, cognitive, and emotional responses. In turn, these processes have also been associated with physiological responses. Emotion, in particular, is crucially tied to ANS activity (for reviews, see Levenson, 2003; Kreibig, 2010). For example, Prkachin et al. (1999) instructed participants to recall moments in their lives when they experienced intense happiness, anger, fear, sadness, and disgust, and these examples were used to induce the emotional state while cardiovascular measurements were taken. Heart rate was greater during any condition where emotion was recalled, compared to the neutral control condition. Although the specific profiles of emotions and physiological response may not always be clear (Critchley, 2005), studies have found positive linear associations between emotional intensity and physiological response (Bernat, Patrick, Benning, & Tellegen, 2006). In addition, the recognition of *others'* emotions also has physiological consequences. Levenson and Ruef (1992) found that accuracy of emotion judgements between an actor and an observer was related to the similarity of their physiological responses.

Therefore, experiencing emotions when transported into fiction should be tied to measurable changes in variables such as heart rate variability. In fact, there is some evidence for the effects of reading emotional stories on physiology. For example, Bar-Haim et al. (2004) examined cardiovascular activity in a sample of children (mean age of 7.2 years) as they completed emotional or neutral stories (begun by the experimenter and played out with dolls). Heart rate variability significantly decreased during emotional stories compared to neutral stories, especially for stories involving themes of separation and reunion.

Research using adult samples also shows physiological effects while processing emotional narratives. Wallentin et al. (2011) looked at participants' amygdala activation and heart rate variability when listening to audio versions of *The Little Duckling* by H. C. Andersen. Participants' judgments of the emotional intensity of the story were associated with decreased heart rate variability, as well as brain activation in areas associated with auditory

processing and emotional response.

However, not all studies have found consistent physiological correlates of emotion while reading. For example, Brouwer et al. (2015) measured participants' skin conductance and heart rate while reading emotional or non-emotional sections of a novel. After controlling for the time it took to read the text, heart rate variability was greater, and skin conductance lower, for emotional sections of the novel compared to non-emotional sections; this was inconsistent with predicted effects. Goetz et al. (1993) also examined participants' heart rate while reading a story, but found that heart rate was not significantly associated with participants' ratings of affect or imagery during reading. However, this may have been because transportation while reading the narrative was not controlled for in this research.

In sum, the above studies demonstrated that variables associated with transportation and reading also have physiological correlates, such as increased heart rate and decreased heart rate variability (i.e., Wallentin et al., 2011). Transportation itself, however, has never been linked directly to physiological changes, and may explain discrepancies in some results of physiology and reading in previous studies (i.e., Goetz et al., 1993). The present study measured transportation and physiological responses while reading a fiction passage containing sexism.

Based on Transportation Theory, it was predicted that increased transportation would be associated with increased ANS activity (as shown by decreased heart rate variability), due to processes such as greater emotional responding. In addition, sexism — measured both explicitly, and with a newly developed implicit measure of ambivalent sexism (Oliveira Laux, Ksenofontov, & Becker, 2015) — should be negatively associated with transportation after reading fiction, as in some of my previously reported studies.

Method

Participants

Participants were 123 University of Otago students, recruited through a student job service. Participants were reimbursed \$15 to cover travel costs. Participants were 43 males and 80 females, with an age range of 18 to 45 years.

Materials

Empathy, transportation, ASI, IRI, and mood were measured as in Studies 2 to 6. In addition, Need for Cognition was included as in Study 1, although only as an exploratory measure, and was not included in subsequent analyses².

Hostile and benevolent sexism were also assessed on implicit measures, using a newly-developed IAT procedure shared by its developers (Oliveira Laux et al., 2015), covering both implicit benevolent and hostile sexism. The stimuli were designed to be analogous to the explicit benevolent and hostile subscales of the ASI. Oliveira Laux et al. (2015) found that their implicit measures of benevolent and hostile sexism correlated well with the explicit measures of benevolent and hostile sexism respectively. For the hostile sexism IAT, participants were instructed to associate threatening and non-threatening words with traditional and non-traditional female roles (see Table 6.1).

As the original IATs were written in German, some changes had to be made due to some awkwardness that resulted from translation into English. These changes consisted of substituting words with their synonyms, or if no synonym was available, with other comparable categories. Thus, for the traditional women, *governess* was changed to *babysitter*, and *kindergarten teacher* was shortened to *teacher*. For the non-traditional women, *female protester*, *suffragette*, *female agitator*, and *vamp* were changed to *policewoman*, *lesbian*, *career woman*, and *temptress*.

²The Need for Affect-short form (Appel & Malečkar, 2012) was also included in the study; however, the reliability of the overall scale and its subcomponents was so low that it could not be included in the analysis.

Table 6.1

Target and Attribute Words for the Hostile Sexism Implicit Association Task

	Target		Attribute	
Traditional Woman	Non-Traditional Woman	Threatening	Non-Threatening	
Nurse	Policewoman*	Snake	Love	
Mother	Lesbian*	Misfortune	Rainbow	
Teacher*	Career Woman*	Ambush	Trust	
Secretary	Temptress*	Pain	Holiday	
Babysitter*	Feminist	Torture	Paradise	

Note: * Items altered from original IAT.

For the benevolent sexism IAT, participants were required to associate pleasant words (warmth, love, sun, sympathy, and rainbow) and unpleasant words (discomfort, conflict, anger, foolish, apocalypse) with pictures of active men or women (see Figure 6.2). As with the hostile IAT, some items needed to be replaced with their synonyms: *dispeace*, *irritation*, *idiocy*, and *end of the world*, were replaced with *conflict*, *anger*, *foolish*, and *apocalypse*. In the pictures, the “active” target refers to the gender of the actor who is performing the action. The same images were used for “active male” and “active female” stimuli; see Appendix O for stimuli).

A congruent trial for the hostile sexism IAT included the pairing of non-threatening attributes and traditional women (as described above), and threatening attributes and non-traditional women. A congruent trial for the benevolent sexism IAT involved pairing the active man cartoons with the pleasant attributes, and active women cartoon with the unpleasant attributes.

The fiction passage given to participants was the gender chapter from *The Handmaid’s Tale*, used in Studies 2 to 4. This passage was chosen over *Two Were Left* because of the

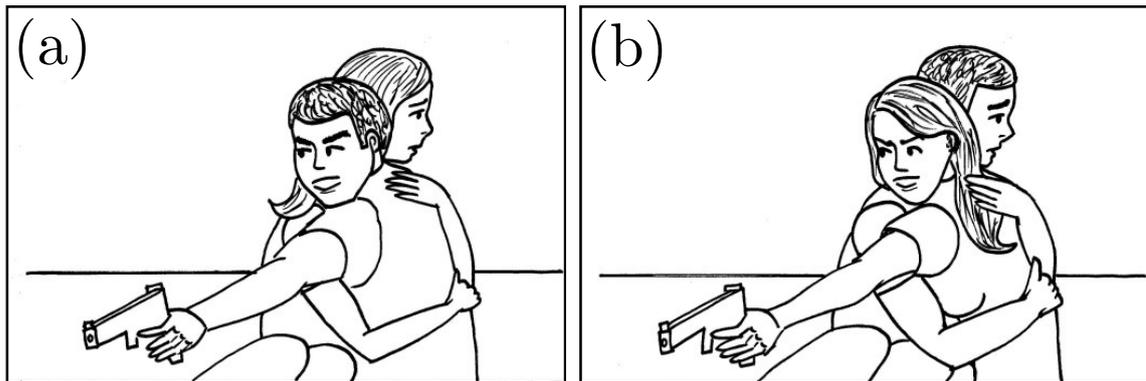


Figure 6.2. Example of an (a) “active man” and (b) “active woman” image for the benevolent sexism IAT. Images from Oliveria Laux et al. (2015).

former’s explicit sexism content, and the latter’s shorter length (477 words). Although the optimal sampling duration has not been established for measuring HRV, recordings of 2 to 5 minutes have been used successfully (Bigger, Fleiss, Rolnitzky, & Steinman, 1993; Sloan et al., 1994). The average adult reader (at 70% comprehension level) reads 200 to 300 words per minute (Jackson & McClelland, 1975), so it was determined that the longer text (*The Handmaid’s Tale* at 2,384 words) was more appropriate for data collection.

Empatica E4 wristbands were used to record the physiological responses while reading. These are wireless wristbands that record blood volume pulse (through a photoplethysmograph) and skin conductance (through an electrodermal activity sensor)³. The photoplethysmograph releases green and red light through an LED on the underside of the wristband, and measures the amount of light absorbed by the wearer’s oxygenated blood, compared to the light reflected back to the sensor (Sahni, 2012). The green light is absorbed by the blood pulsing under the skin, and is therefore the source of heart rate data. Red light, being a different wavelength, is absorbed by other body tissues and is used to collect artefact data that can be removed from the signal. From the blood pulse volume data, heart rate and heart rate variability can be calculated (www.empatica.com).

³Skin conductance data were collected as a physiological measure this study; however, due to wristband malfunction these data were unable to be extracted or used.

Procedure

After giving informed consent, participants were introduced to the purpose and function of the wristband, which was attached to their left wrist. From that point, all instructions and procedures were presented via Qualtrics online software. Participants completed the IRI, Transportability Scale, and Need for Cognition Scale with scale order randomised for each participant. After completing these measures, participants were prompted to inform the experimenter, who subsequently instructed participants how to use the wristband to “tag” events (by pressing the button on the wristband for one second). A baseline recording was taken by asking participants to sit still and unobserved for four minutes. A timer on screen showed them how much time was remaining, and participants were unable to proceed until the timer had counted down four minutes. Next, participants were instructed to read the stimulus materials, after which they completed the Transportation Scale, ASI, demographic, mood, and reading measures, followed by the two IATs. IAT ordering was counterbalanced, with participants randomly assigned to the ordering of congruent and incongruent trials for each IAT. After completing all measures, participants were debriefed and dismissed.

Results

Descriptive and reliability statistics are presented in Table 6.2. For mood measures, the happy item was reverse scored and a composite mood score created by averaging across all items. In addition, the maximum scores across individual mood items was used as a measure of emotional intensity.

For the IATs, the conventional treatment for IAT data was applied (Greenwald et al., 1998) whereby responses faster than 300ms and slower than 10000ms were removed, as were incorrect responses. Reaction times were then standardised, and congruent trials were subtracted from incongruent trials, so that positive scores indicated longer times responding

Table 6.2

Descriptive Statistics and Reliability for Self Report and Implicit Measures

	Mean	SD	Cronbach's α
IRI	3.48	0.40	.77
Transportability	6.20	1.08	.87
Transportation	4.34	0.78	.74
Explicit Hostile Sexism	2.82	0.92	.87
Explicit Benevolent Sexism	3.18	0.95	.84
Mood	2.12	1.40	.77
Emotion Intensity	5.36	1.56	
Implicit Benevolent Sexism	-0.10	0.34	
Implicit Hostile Sexism	0.45	0.28	
Reading	3.79	1.55	

Note: IRI = Interpersonal Reactivity Index.

to incongruent trials compared to congruent trials (i.e., sexist responding).

For the physiological measures, 93 participants had viable data (i.e., no wristband malfunction, tagging errors, or missing data). For these participants, heart rate variability was examined.

Kubios software (version 2.2) was used to extract heart rate variability data from the inter-beat interval (IBI) data collected from the Empatica wristband, and to correct data for artefacts and linear trends. Very strong artefact corrections and smoothing were applied to the data, to control for trends in the IBI (which can influence heart rate variability parameters; Tarvainen, Niskanen, Lipponen, Ranta-aho, & Karjalainen, 2014). To transform the IBI data for analysis, two different algorithms may be used to determine the power spectral density: Welch's periodogram non-parametric method (FFT spectrum) for power spectral density, or autoregressive modelling (AR). These methods often provide compara-

ble results, but the AR spectrum was used in Study 7 as this parametric measure is a more sensitive test (Task Force of The European Society of Cardiology, 1996).⁴

From IBI data, both time-domain and frequency-domain data were calculated; however, use of time-domain measures should be restricted to comparing samples collected over the same time period (as recommended by the Task Force of The European Society of Cardiology, 1996). As the samples used in Study 7 were all of different durations, only frequency-domain results were used. Frequency domain data include very low, low, and high frequency measures (both absolute and normalised), and the high/low frequency ratio.

The high frequency range (0.15-0.4 Hz) of IBI (Shaffer et al., 2014), reflects parasympathetic nervous system activity, while the low frequency range (0.04-0.15 Hz) of IBI is more indicative of sympathetic nervous system activity (Malliani, Lombardi, & Pagani, 1994); so the low frequency range was the measure selected for data analyses. However, it should be noted that this is a more controversial measure as some research suggests that low frequency components may also involve PNS activity. Yet this component still reflects SNS activity, and performing normalised power transformations of the frequency data (calculated by dividing the frequency power by total power and subtracting VLF from the measure) helps further to interpret results, as the normalised measures better indicate the relation between HRV components, compared to absolute measures (Malliani et al., 1994). Therefore, only normalised power was used as it is more resistant to artefacts and more indicative of the balance between SNS and PNS branches of the ANS (Task Force of The European Society of Cardiology, 1996). Descriptive statistics for absolute and normalised measures of both LF and HF power measures are available in Appendix P. Very low frequency (< 0.04 Hz) measures were not used as they are not necessarily meaningful (Rajendra Acharya et al., 2006). Neither was LF/HF ratio data used as this measure also suffers from interpretability issues, and some researchers advise against using this measure

⁴The FFT method was also tested; however, when this method was used the results followed the same pattern as the AR spectrum, albeit to a weaker extent.

(Shaffer et al., 2014).

Correlations between the dependent measures are presented in Table 6.3. Only LF was presented, as HF power is simply the inverse of LF power measures. Although HRV should decrease with ANS activity, for the LF power component of HRV higher scores represent greater sympathetic nervous system activity.

Table 6.3

Pearson's Correlation Coefficients for Reading Measures, Demographics, and Individual Differences Measures

	1.	2.	3.	4.	5.	6.	7.	8.	9.	
1. Reading										
2. IRI	-.08									
3. Transportability	.23*	.45**								
4. Transportation	.18*	.36**	.63**							
5. Hostile Sexism	-.35**	-.11	-.09	-.12						
6. Benevolent Sexism	-.47**	.09	-.04	-.08	.52**					
7. IAT Hostile Sexism	-.17	.02	.05	.03	.07	.15				
8. IAT Benevolent Sexism	-.19*	-.09	-.12	-.09	.25**	.26**	.08			
9. Mood	-.04	-.03	.10	.09	-.05	-.03	-.12	-.07		
10. Emotion Intensity	.01	.21*	.20*	.23*	-.05	-.02	.06	.003	.25**	
11. LF	-.04	-.05	-.06	.03	.13	.08	.19	.29**	.08	-.05

Note: IRI = Interpersonal Reactivity Index; IAT = Implicit Association Test; LF = Low frequency normalised power, no units.

* $p < .05$; ** $p < .01$

Transportation was significantly and positively correlated with measures of reading habits, empathy, transportability, and emotional intensity. Transportation was not associated with sexism, or with LF power.

The IAT BS did correlate with the explicit measure of benevolent sexism as shown in the ASI BS subscale. However, this IAT also correlated with the ASI HS subscale, whereas the IAT HS did not correlate with either explicit measure.

LF power was significantly associated with implicit benevolent sexism, but not with any other measure. The relation between HRV and sexism was unexpected, especially as both sexism and HRV were unrelated to transportation. To test whether this association between sexism and HRV was dependant on transportation, multiple regressions were run using Hayes' (2013) PROCESS macro for SPSS (model 1). Low frequency heart rate variability during reading was entered as the independent variable, transportation as the moderator, and baseline LF and reading time as covariates (see Table 6.4). A significant interaction between transportation and low frequency power was found for implicit benevolent sexism. For conditional effects see Figure 6.3.

Table 6.4

Linear Model of Transportation and Low Frequency Normalised Power as Predictors for Implicit Benevolent Sexism

	<i>b</i>	SE <i>b</i>	<i>t</i>	LLCI	ULCI
Transportation	-0.05	0.04	-1.19	-0.13	0.03
LF	0.01	0.002	2.71	0.002	0.01**
Transportation × LF Covariates	-0.01	0.003	-2.54	-0.02	0.00**
Reading time	0.0003	0.0001	2.08	0.0000	0.001
Baseline LF	0.0000	0.003	0.01	-0.01	0.01

Note: LF = Low Frequency normalised power.

** $p \leq .01$

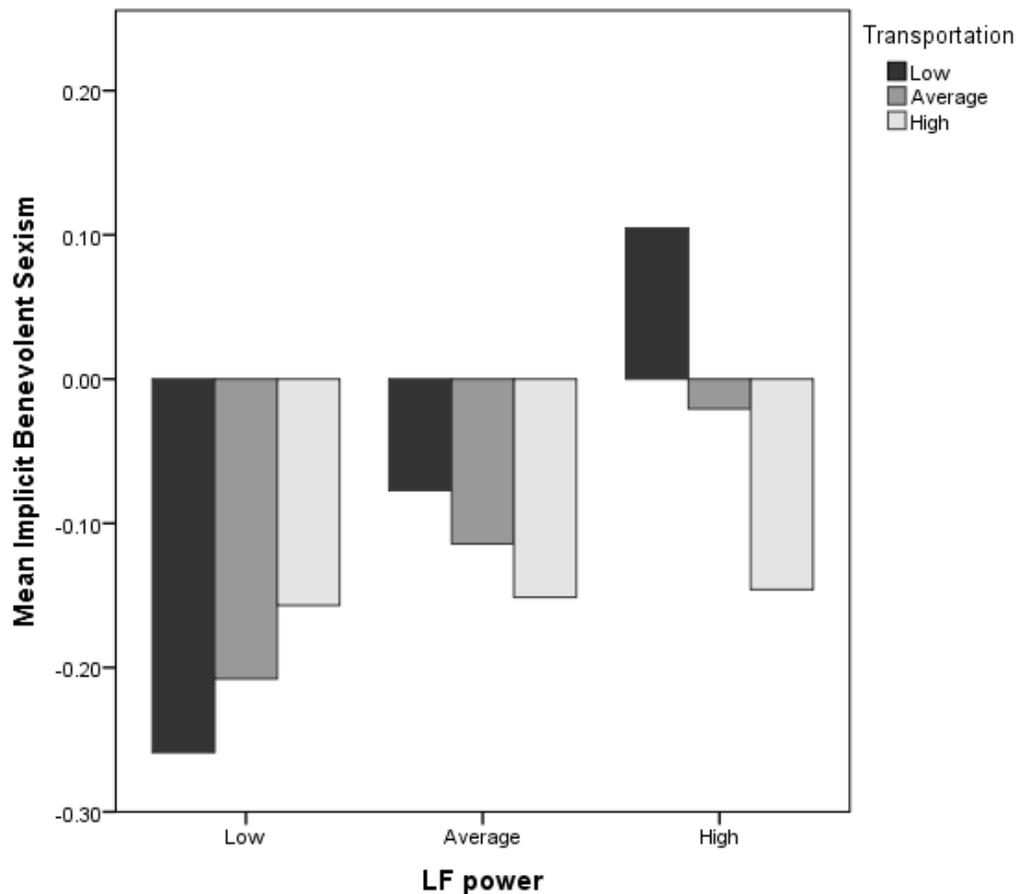


Figure 6.3. Conditional effects of transportation on low frequency normalised power and implicit benevolent sexism. Negative scores indicate less benevolent sexism. Higher LF power indicates more SNS activity.

The J-N technique for implicit benevolent sexism showed that up to a score of 4.6 on the transportation scale there was a significant positive association between LF power and implicit benevolent sexism $b = .005$, $SE = .003$, $t = 1.99$, $p = .05$, 95% CI [.00, .01]. This meant that for participants who reported lower transportation, as LF power (i.e., SNS arousal) increased, so did implicit benevolent sexism. The association between LF and sexism was not significant for more transported readers.

Discussion

Transportation while reading fiction was predicted to show physiological correlates (as indicated by heart rate variability; HRV), as well as an association with sexism scores, however, transportation was not directly correlated with either sexism or HRV. Yet, HRV was significantly associated with implicit benevolent sexism.

Van Laer et al. (2014) stated that transportation should show physiological effects, as transported readers experience narratives as if they were real. Yet, no direct association was found between transportation and HRV. Perhaps this was not surprising as HRV can be influenced by a myriad of variables; potentially including processes associated with both high and low transportation. High transportation theoretically reflects an immersion in the story that should produce decreased HRV, but low transportation may support counterarguing, which has also been associated with decreased HRV (Cacioppo, Sandman, & Walker, 1978).

The positive association between low frequency HRV and sexism potentially implicates processes other than transportation. In previous studies in this thesis (e.g., Study 2), fiction readers who were less transported actually reported *higher* sexism, compared to more transported readers (or non-fiction readers). This pattern of results allows for the possibility that low transportation was also associated with higher low frequency HRV, due to processes such as counterarguing. Counterarguing (the generation of ideas and thoughts that oppose a perceived intended message), for example, has been associated with increased heart rate and decreased heart rate variability (Cacioppo et al., 1978; Cacioppo, 1979) and with low transportation (Green & Brock, 2000). If HRV was then associated with both high and low transportation, this would have obscured the predicted relationship between HRV and transportation.

Indeed, a significant interaction was found for transportation and HRV; HRV and sexism were only associated for participants who reported low transportation, consistent with

reactance to the story. Therefore, readers who are not transported may find more opportunities to consider and analyse the arguments and issues of the text, producing increased cardiovascular response similar to highly transported readers, but for different reasons.

Although the interaction between HRV and transportation is consistent with this interpretation, there are a number of alternative accounts. For example, it may be that more sexist participants are less likely to get transported into a story with sexism-related content, and more likely to react to that story content with anger (which would increase SNS activity). Monteith et al. (1993) found that more prejudiced participants, who are confronted with greater discrepancy between perceived and actual standards of behaviour, were more likely to respond with anger towards others. Alternatively, participants who experienced a greater stress response during the task may have struggled to become transported into the story and this may have led to reactance and increased sexism.

More surprising is that there did not seem to be any association between HRV and sexism among highly transported readers. One interpretation of this result is in terms of a threshold effect, whereby once a reader reaches a certain level of subjective transportation, the readers' physiological state becomes irrelevant for interpreting the effects on attitude change. Alternatively, contrast effects may be present, as transportation itself may be a rewarding process (Bilandzic & Busselle, 2008), and be associated with reading enjoyment (Quintero Johnson & Sangalang, 2016). Thus, while some transported participants may have been more emotionally aroused from reading (and shown subsequent effects on sexism), others may have been relaxed or contented, both of which are associated with lower ANS activity (Christie & Friedman, 2004; Schwartz, Weinberger, & Singer, 1981). In this case, these highly transported participants could have shown lower implicit sexism, but also experienced greater contentment or relaxation while reading.

While implicit benevolent sexism was associated with HRV, the explicit measures of sexism were not related to any other measure, with the exception of a negative associa-

tion with reading habits (as in Study 1). In addition, while an interaction for HRV and transportation was found for implicit benevolent sexism, no interaction was found for the other measures of sexism. It is possible that the effects of HRV and transportation for explicit sexism were not strong enough to be seen in this sample, but that HRV was sensitive enough to show the cognitive processes involved for implicit conceptual associations. This interpretation is only speculative, and future research would have to be conducted in order to distinguish between such processes for physiological measures.

In summary, although transportation was not directly associated with HRV, these measures interacted to predict implicit sexism. Because physiology is somewhat of a black box when it comes to examining associated cognitive processes, it is probably more appropriate to use measures such as HRV in conjunction with subjective reports, to gain a more complete understanding of what is occurring, say, when a person is reading.

However, it is important to note, again, that the effects were limited to an implicit measure of sexism and one index of physiological response. In turn, the association between HRV and sexism was only seen for participants who reported low transportation while reading. Due to the correlational design of this study, potential interpretations are severely limited, and what these results mean for transportation is still ambiguous and complicated. While physiology is a useful tool, it is also a crude tool, as many processes that are both relevant and irrelevant, theoretically, may influence the responses (Paas, Van Merriënboer, & Adam, 1994). Nevertheless, this exploratory study does serve to highlight the fact that reading, transportation, and attitude change may show up in non-verbal reactions, which could be useful in the future for testing the hypothesised relations among them.

Chapter 7: General Discussion

To have one's nose in a book is a widely accepted leisure activity, yet only recently have the prosocial benefits of fiction begun to be empirically tested. As reviewed in Chapter 1, narrative has been proposed to be a powerful method of persuasion. Fiction is a medium that can help change attitudes regarding homosexuality (Green, 2004), friendship (Green & Brock, 2000), safe sex (Bonomi et al., 2014), immigration (Vezzali et al., 2014), and race (Johnson, Jasper, et al., 2013), among others. In turn, while reading narrative may lead to attitude change, some evidence suggests that the effect is more likely when readers are transported into the narrative.

The purpose of this thesis was to apply the research on narrative persuasion to the problem of sexism, and also to explore the role of transportation in any effects. Sexism requires examination as it is a unique, systemic, and pervasive form of discrimination (Nicol & Rounding, 2013). Even seemingly positive aspects of gender stereotypes, such as evaluating women as naturally warm and nurturing, may reinforce gender inequality and promote hostile reactions against women who deviate from traditional feminine roles (Becker, 2010). The specific goals of the present thesis were twofold: First, to determine whether fiction reading could be used to influence readers' attitudes towards women, and second, to assess whether transportation improved narrative persuasion effects. It was predicted that transportation would moderate the effects of fiction reading on sexism. Indeed, across several studies, readers who were more transported after reading fiction reported lower sexism (see Table 7.1 for results summary).

In Study 1, reading was associated with lower sexism (a finding replicated in all subsequent studies; see Figure 7.1 and 7.2 for meta-analyses¹). Fiction and non-fiction effects were separated in Study 2, where reading was experimentally manipulated. Among more

¹The Hunter and Schmitt random-effects method was used (using syntax for SPSS from Field & Gillett, 2010) to conduct two analyses, one for benevolent, and one for hostile sexism.

Table 7.1

Summary Table of Main Results for Studies 1 to 7 for Findings Involving Transportation, Reading Conditions, and Sexism

Study Design	Sample	Main Dependent Measures	Main findings
Study 1 (Ch. 3): Correlational study comparing ART scores to explicit and implicit sexism measures	University of Otago students (<i>N</i> = 74)	ART Hostile ASI Benevolent ASI IAT moral IAT strong	ART scores negatively correlated with explicit and implicit sexism measures. Transportability was not a moderator of this association.
Study 2 (Ch. 4): Fiction versus non-fiction conditions comparing measured transportation to explicit sexism	MTurk (<i>N</i> = 180)	Transportation Hostile ASI Benevolent ASI	Transportation was a moderator for reading condition on hostile and benevolent sexism. For less transported readers, fiction was associated with higher benevolent and hostile sexism. For more transported readers, fiction was associated with lower benevolent sexism.
Study 3 (Ch. 4): Fiction conditions comparing gender and no gender content to measured transportation and explicit sexism	MTurk (<i>N</i> = 192)	Transportation Hostile ASI Benevolent ASI	Transportation was not a significant moderator of the association between fiction condition and sexism.
Study 4 (Ch. 4): Fiction conditions comparing gender and race content to measured transportation and explicit measures of sexism and racism over two weeks	University of Otago students (<i>N</i> = 103)	Transportation Hostile ASI Benevolent ASI SAAAS	Transportation was a moderator for reading condition on hostile sexism. More transported readers showed a greater reduction in hostile sexism over two weeks. No differences were found for the racism condition or measures.
Study 5 (Ch. 5): Manipulation of mental imagery compared to fiction and non-fiction conditions for explicit sexism ”	MTurk (<i>N</i> = 440)	Transportation Hostile ASI Benevolent ASI	Imagery and reading conditions interacted for benevolent sexism; however, transportation was not a mediator of the effects of imagery on sexism. Higher “imagery” was associated with higher benevolent sexism for fiction readers.
Study 6 (Ch. 5): Manipulation of imagery compared to fiction conditions (girl and boy protagonist) for explicit sexism	MTurk (<i>N</i> = 300)	Transportation Hostile ASI Benevolent ASI	Imagery and reading conditions interacted for benevolent sexism; however, transportation was not a mediator of the effects of imagery on sexism. Higher imagery was associated with decreased benevolent sexism in the girl condition.
Study 7 (Ch. 6): Correlational study comparing transportation and HRV for implicit and explicit sexism	University of Otago students (<i>N</i> = 123)	Transportation LF HRV Hostile ASI Benevolent ASI IAT benevolent IAT hostile	Transportation was a moderator for HRV effects on implicit benevolent sexism. Less transported readers showed a positive association between HRV and sexism, with no association found for more transported readers.

Note: ASI = Ambivalent Sexism Inventory; IAT = Implicit Association Test; SAAAS = Scale of Anti-Asian American Stereotypes; LF = Low Frequency normalised power; HRV = Heart Rate Variability.

transported participants, readers of fiction showed lower sexism compare to non-fiction readers; the opposite was true among less transported participants. Varying sexism content in the readings revealed no effects in either Study 2 or Study 3, but in Study 4 sexism decreased over two weeks for readers transported into a story about sexism, compared to a story about racism.

Because of the causal ambiguity of relying on self-reported transportation, imagery was used in Study 5 and Study 6 in an attempt to manipulate transportation. Study 5 compared mental imagery training to a task meant to reduce transportation, and to a neutral control condition. Contrary to the hypothesis, mental imagery training led to increased sexism after reading fiction, independent of transportation. In Study 6, pictures accompanied the text; in this case, the imagery reduced sexism, but again had no measureable impact on transportation itself. Finally, Study 7 was designed to explore physiological correlates of transportation. Transportation was not associated with heart rate variability directly; however, less transported readers showed a positive association between heart rate variability and sexism, with no differences for more transported readers.

In summary, fiction reading was generally associated with less sexist attitudes. While overall fiction reading appeared to drive effects, the content of the stories was also important, although effects only appeared after a delay. In addition, the effects of reading on sexism were conditional upon transportation, supporting predictions that transportation was a moderator for narrative persuasion. Yet these results were not always consistent, with some effects driven by high transportation, and others by low transportation. Failure to manipulate transportation means that ultimately, these results are a tentative suggestion of transportation effects. These results have several implications for narrative, transportation, and sexism research.

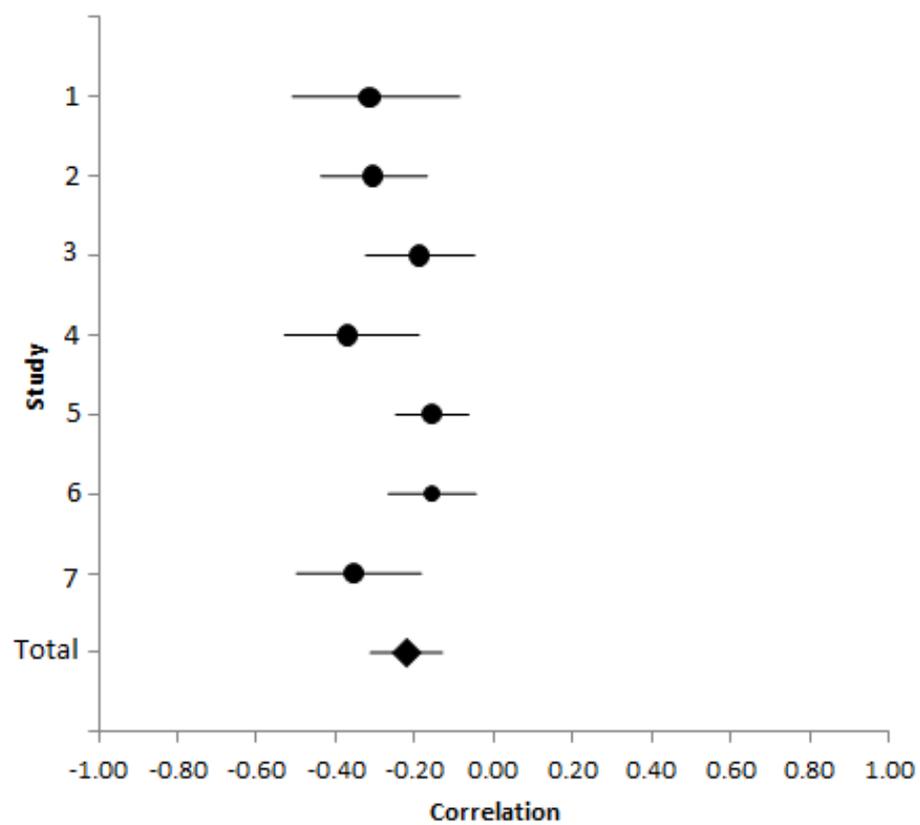


Figure 7.1. Correlations and confidence intervals across studies for the relation between reading habits and hostile sexism. Diamond represents meta-analytic effect across studies.

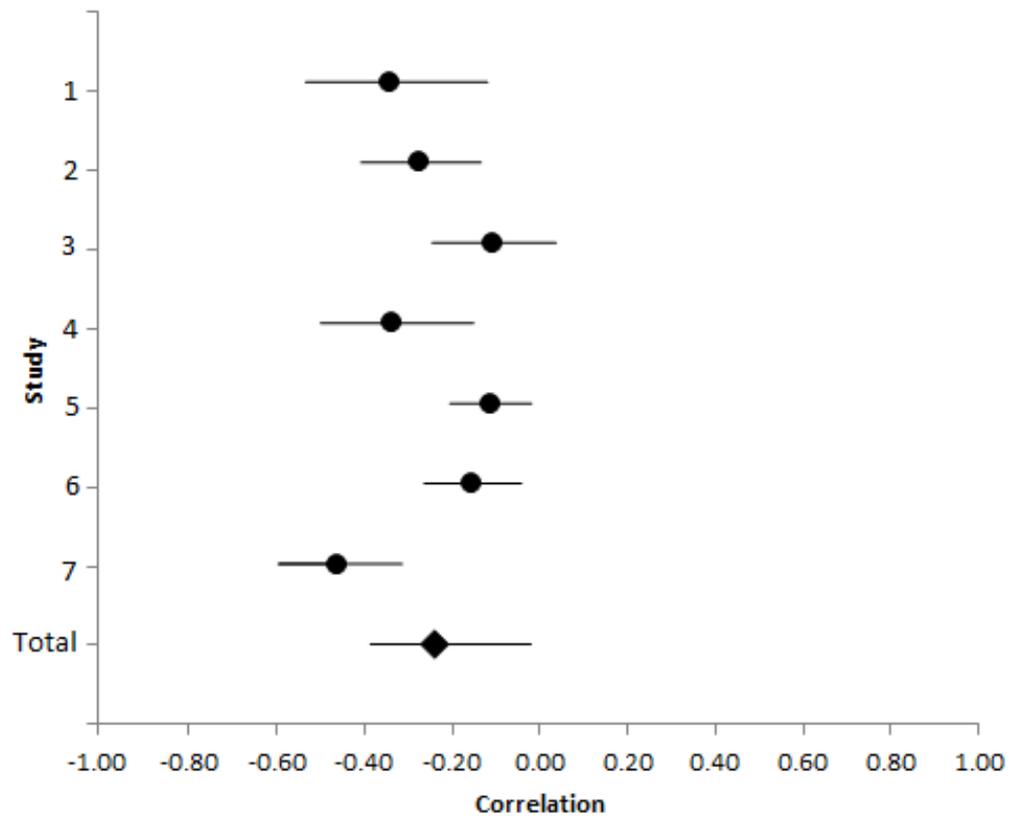


Figure 7.2. Correlations and confidence intervals across studies for the relation between reading habits and benevolent sexism. Diamond represents meta-analytic effect across studies.

Theoretical Implications

Fiction Reading. The effects of reading fiction (versus non-fiction) in this thesis are generally consistent with previous research on fiction effects on social skills such as theory of mind and empathy, in both correlational (Mar et al., 2006; Fong et al., 2013), and experimental studies (Kidd & Castano, 2013; Bal & Veltkamp, 2013; Pino & Mazza, 2016). Sexism — and other discriminatory attitudes — had not received much examination, and what studies had been conducted (i.e., Fong et al., 2015) used correlational, or dated measures. Thus, the results in this thesis extend this previous work, and provide an updated and experimental example of narrative-driven attitude change in the domain of sexism.

What is it about fiction that leads to attitude change? First, the results of this thesis suggest that content matters to some extent. Previous studies have found that only measures that are directly relevant to content were affected by narrative persuasion. This was evidenced by Green and Brock (2000) and Appel and Richter (2010) where abstract (but distally related) beliefs about psychiatric patients or asylum seekers were not affected by stories, whereas specific beliefs were. Although content effects were not consistently shown across studies in this thesis (effects were absent in Study 2 and Study 3), evidence for content effects did emerge in Study 4, the study with arguably the most powerful design. In that study, reading about a sexist event reduced sexism for highly transported readers over time, but did not reduce racism. This suggests that on one level of narrative persuasion, effects occur when readers learn about, or consider, the specific situation involved in the story. That these effects only emerged over time, also suggests that readers may ruminate on story content, allowing for related attitudes to become incorporated into their self-concept (Bal & Veltkamp, 2013).

There also appears to be effects of fiction reading, independent of content. Previous studies have linked fiction to increased social skills (i.e., Kidd & Castano, 2013; Bal & Veltkamp, 2013), which in turn may enhance egalitarian beliefs (Batson, Chang, Orr, & Rowland, 2002). Thus, the association between fiction and sexism may represent generalised prosocial attitudes that may emerge from reading.

Fiction readers may report greater theory of mind or empathy because reading allows for more exposure to, and practice with, social interaction. In turn, theory of mind and empathy processes help readers form more sophisticated interpretations of others' social behaviours (Singer & Lamm, 2009). This is especially so for readers of literary fiction, which involves more focus on characters and character development (Fong et al., 2015). In fact, Kidd and Castano (2013) showed that the effects of theory of mind after reading were greater for literary fiction, compared to popular fiction (which focuses on plot rather

than social processes). Therefore, it could be argued that the social processes present in fiction allow for increased ability to perceive others' mental states and thoughts, and this is what leads to the changing of attitudes towards those consistent with the story. Of course, the level of social processing in the text materials was not tested explicitly in this thesis, although a post-hoc linguistic analysis (using Linguistic Inquiry and Word Count software; LIWC, 2007 Pennebaker, Booth, & Francis, 2007)) did show that all the fiction readings included in this thesis involved more references to social processes (i.e., 11% to 15% of fiction passages), compared to non-fiction (6.5%).

Thus, reading appears to influence attitudes through exposure to both specific content as well as general social interaction. Narrative contains more examples of social processes and interactions, and this could be the "content" that drives more prosocial attitudes and behaviour. Indeed, this idea is closely related to Social Cognitive Theory (Bandura, 1986), and entertainment-education researchers have previously argued that narratives provide opportunities to learn new behaviours (Moyer-Gusé, 2008). In turn, other theories of narrative persuasion have also touched on this social aspect of reading, including Simulation Theory (Oatley, 1999), where narrative is proposed to work as a simulation of the real world, and the Parasocial Interaction Hypothesis (Schiappa et al., 2005), where narrative consumers respond to characters as they would real people. Therefore, reading provides practice at relationships (Shedlosky-Shoemaker et al., 2014), and allows for a safe space to practice social interaction (Johnson, Jasper, et al., 2013).

Transportation. The results of this thesis also show that the effects of reading fiction on sexism are conditional upon readers feeling transported, consistent with previous studies that use transportation as a moderator for attitude change (Richter et al., 2013; Appel & Richter, 2010; Shedlosky-Shoemaker et al., 2014). Transportation allows readers to experience being in the narrative, and thus helps make reading more effective. However, it is also important to consider the effects for less transported readers, especially as these

results also hold implications for the processes involved in Transportation Theory.

Indeed, in some of the current studies (Study 2 and 7), interactions were driven by the fact that less transported readers reported higher sexism. Both decreases and increases in sexism by more and less transported readers are consistent with Transportation Theory; increased sexism is likely due to reactance or counterarguing, processes transported readers supposedly avoid (Bal & Veltkamp, 2013). However, because transportation was a measured variable, the direction of these effects was not established across these studies and therefore the results could also reflect individual differences, such as participants' pre-existing sexism levels. Higher sexism may have prevented transportation from occurring in the first place for some of the readers.

In addition, while transportation sometimes moderated the effects of reading on attitudes, the difficulty in manipulating transportation highlighted the ambiguity surrounding just what transportation cognitively entails. That transportation was not manipulated by imagery, even though sexism itself was, has implications for the proposed processes in transportation theory. That imagery would influence attitudes independently of transportation is inconsistent with Green and Brock's (2000) Transportation Theory, which proposes that imagery processes are a component of transportation. Instead, the results suggest that imagery is not so much one component of transportation, but instead is an important independent variable for narrative engagement. Of course, in Studies 5 and 6, it was also possible (and the manipulation check suggested) that imagery itself was not successfully manipulated. Yet even this caveat emphasises the ambiguities that stem from the theoretical roots of transportation. This is not the first time Transportation Theory has been challenged. For example, de Graaf et al. (2009) manipulated narrative engagement on several scales (including transportation), with different methods of disruption. The authors found that disruption did not affect all components of transportation, but also that different disruptions affected different measures, indicating independent processes within narrative

engagement.

Sexism. Another theoretical implication of the results in this thesis lies with the differences across sexism measures. Ambivalent sexism was used to examine sexist attitudes as it included both measures of hostile and benevolent sexism. One of the primary motivations for using benevolent sexism was that the idea that attitude changes were more likely to be observed on a more covert and contemporary measure of sexist attitudes. Indeed, most of the studies in this thesis demonstrated effects for benevolent sexism, rather than hostile sexism (only in Study 4 was higher transportation associated with lower hostile sexism). This is notable, among other reasons, because “benevolence” distinguishes sexism from many other forms of discrimination, even other patriarchal prejudices such as homophobia. These results also extended to implicit measures in Studies 1 and 7, suggesting that rather than simply learning how to respond in a socially acceptable way after reading, fiction also integrates these prosocial concepts into associative networks (Johnson, Jasper, et al., 2013). These results are therefore promising, as these prosocial changes are then more likely to have lasting, long-term effects (Dal Cin et al., 2004).

To the extent that transportation moderates the effects of fiction narrative on sexist beliefs, the results have obvious practical implications. For example, they suggest that engaging fiction stories, particularly about women, could help reduce biased attitudes towards women. These results also have theoretical implications; the moderating effect of transportation suggests that while fiction is the main driver of effects for sexism, that the conditions provided by transportation make this more or less likely. Rather elegantly, narrative persuasion may use the imagined interactions of characters to inform real attitudes, while travelling into the narrative presents the opportunity to absorb these interactions and information in a less “reality encumbered” state.

However, these results also offer a cautionary perspective. First, low transportation drives some of the effects, indicating that “transportation effects” in previous studies may

reflect the absence of transportation and its associated mechanisms. Second, these results also highlight how much of the theory for transportation has been intuitive rather than empirically derived, and many ambiguities exist regarding its components and processes by which it interacts with narrative persuasion. This can not only lead to difficulty in interpreting results, but also might obscure the fact that these are actually independent, concurrent processes rather than components of transportation.

Limitations

Ultimately, the greatest limitation of these studies stems from the failure to manipulate transportation. Because transportation was not manipulated successfully, a causal link between transportation and sexism could not be clearly established, and the observed effects could be due to other factors that are closely related to reading, transportation, and sexism. For example, education level (Scales & Rhee, 2001), cognitive ability, and reading comprehension (Stanovich & Cunningham, 1992), are associated with reading practices but also with increased transportation (Bal & Veltkamp, 2013), egalitarianism (Nicol & Rounding, 2013), as well as decreased social dominance orientation, and right-wing authoritarianism (Heaven, Ciarrochi, & Leeson, 2011). These traits may then also be associated with sexism (Nicol & Rounding, 2013; Glick, Lameiras, & Castro, 2002; Pratto, Sidanius, Stallworth, & Malle, 1994; Christopher & Mull, 2006). This long list of potential individual differences seems problematic for interpreting the results of this thesis; however, as more research is conducted for transportation and narratives, evidence is emerging that rules out some of them. For example, transportation has been associated with empathy even after controlling for personality variables such as openness, gender, transportability (Mar et al., 2009), and intelligence (Mar et al., 2006). While these effects cannot be separated in the present thesis, future research may be more successful in empirically supporting the effects of manipulated transportation on fiction and sexism.

In addition to the limitations associated with correlational research, the current work

has other, acknowledged weaknesses, including some common to narrative persuasion research. These include sample generalisability, effect sizes, and range of texts used. The samples in this thesis come from University of Otago students, and from American MTurk workers. Indeed, most of the literature on transportation has come from studies conducted using university students as participants (e.g., Mar et al., 2006; Green & Brock, 2000; Bal & Veltkamp, 2013; Fong et al., 2013). University study tends to be associated with a developmental period in which a person's worldview is expanding, and more egalitarian views are being adopted (Altenburger et al., 2016), meaning that attitudes about gender, for example, may be particularly pliable. MTurk workers, while showing a greater age range and diversity, also tend to have similar qualities to university student samples (Buhrmester, Kwang, & Gosling, 2011). Of particular relevance to this thesis, Johnson and Borden (2012) compared measures of transportation and empathy between an MTurk sample and a laboratory sample, after reading a fictional story. Participants showed similar levels of empathy and transportation across samples, however, the MTurk sample reporting higher story involvement and empathy. This may be because MTurk workers are more intrinsically motivated due to the token compensation they receive for participating (Buhrmester et al., 2011). However, no obvious differences were found in the current studies, between the studies conducted using MTurk and those conducted in a laboratory setting.

Another consistent finding in the literature on narrative persuasion is that the effect sizes that accompany significant results tend to be very small. The studies included in this thesis were no exception, with effects only accounting for less than five percent of the variance. It is perhaps unsurprising that reading, something that people may experience so subjectively, would show small effects. Indeed, in her meta-analysis of narrative persuasion effects, Tukachinsky's (2014) found that effect sizes for transportation overall were small (Cohen's $d = .21$); however, the effect sizes found in unpublished research were even smaller (Cohen's $d = .03$), perhaps due to small sample sizes (Tukachinsky, 2014). These results conflict with van Laer et al.'s (2014) interpretation that transportation shows

medium sized effects (.30). However, van Laer and colleagues (2014) also found that using measures other than the Transportation Scale lead to even higher effect sizes, and so concluded that the Transportation Scale is the most robust and conservative measure of narrative persuasion. These small effect sizes might limit some of the practical implications of the results found for the present thesis; however, they also provide a conservative estimate of the real-world impact of narrative persuasion.

In terms of the actual text materials used, the range of texts in this thesis may also limit their generalisability. Often it is difficult to select materials for studies of transportation, as the stories are required to be only moderately transporting (to avoid floor and ceiling effects), and comparing between different texts can easily introduce confounds into an experimental design. In turn, texts created especially for studies may not be as immersive as acclaimed published literary fiction (Green & Brock, 2000), or as suspenseful as popular fiction. On the other hand, using the same few texts across studies, taken from acclaimed stories may be an advantage in the present thesis, as this allows for comparisons to be made between studies. Different studies of transportation, using different texts, are a promising start for examining generalisability for text materials. In turn, making comparisons to non-fiction controls that also contain gender themes will help clarify the fiction and content effects in a full cross-over experimental design.

Future Research

These limitations suggest some clear directions for future research. Better control of text materials, samples, and sample size will help to replicate and clarify effects. But to extend beyond the results of this thesis, another area of interesting future study could include the effects of narrative when the content is more negative. Negative content (i.e., content that has the potential to increase antisocial attitudes), may not result in wholly negative consequences. As Altenburger (2016) argued, books that contain negative themes such as the *Fifty Shades of Grey* series could be consumed in a context whereby discussion

of negative themes, (such as domestic abuse in this example) is created. Although the author's intention in the *Fifty Shades* trilogy was to titillate the reader, discussion around the negative aspects of these books have opened a dialogue about some aspects of abuse and domestic violence (van Reenen, 2014). Some researchers have also gone so far as to state that this social discussion of novels is the actual driver of attitude change, citing sleeper effects as evidence for social effects on persuasion (Maccoby, Maccoby, Romney, & Adams, 1961). However, plenty of examples (i.e., Green & Brock, 2000; Appel & Malečkar, 2012; Zwarun & Hall, 2012; Richter et al., 2013; Shedlosky-Shoemaker et al., 2014) of immediate effects on attitudes after reading exist to suggest that discussion is not the only factor.

Conclusion

In summary, this thesis provides some limited evidence that narrative and transportation are potential methods of shifting sexist attitudes. This thesis extends previous research on social abilities, to another, perhaps unique egalitarian attitude domain. Very little research has been conducted analysing gender biases in narrative persuasion content, and in general, sexism reduction is underrepresented in studies of prejudice reduction (Becker & Swim, 2011).

Transportation was examined as a moderator of narrative persuasion effects, and it was suggested from the results of this thesis that transportation allows for reading fiction to influence attitudes. However, several problems were also highlighted. The extent to which transportation alone is a boundary condition for narrative persuasion was questioned. Manipulating transportation is still the best avenue of narrative persuasion research; however, this still proves difficult to achieve in practice, with manipulations of transportation failing or showing independent effects from transportation measures. Future research must clarify the theoretical and practical applications of transportation in order to further the evidence for belief and attitude change after fiction reading.

Research is beginning to provide empirical support for the effects of narrative persuasion, supporting long-suspecting, anecdotal accounts of the persuasion effects of storytelling. Perhaps the book-burners and censors of the past were right to be concerned — whether it is from *Uncle Tom's Cabin*, *Harry Potter*, or a favourite book, narrative may be a portal to potentially long-lasting attitude change.

References

- Adams, K. A., Nagoshi, C. T., Filip-crawford, G., Terrell, H. K., Nagoshi, J. L., Adams, K. A., & Nagoshi, C. T. (2016). Components of gender-nonconformity prejudice. *International Journal of Transgenderism*, 1–14. doi: 10.1080/15532739.2016.1200509
- Alesandrini, K. L. (1984). Pictures and adult learning. *Instructional Science*, 13, 63–77.
- Altenburger, L. E., Carotta, C. L., Bonomi, A. E., & Snyder, A. (2016). Sexist attitudes among emerging adult women readers of fifty shades fiction. *Archives of Sexual Behavior*, 1–10. doi: 10.1007/s10508-016-0724-4
- Anglin, G. J. (1987). Effect of pictures on recall of written prose: How durable are picture effects? *Educational Communication and Technology*, 35(1), 25–30. doi: 10.1007/BF02769450
- Appel, M. (2011). A story about a stupid person can make you act stupid (or smart): Behavioral assimilation (and contrast) as narrative impact. *Media Psychology*, 14(2), 144–167. doi: 10.1080/15213269.2011.573461
- Appel, M., & Malečkar, B. (2012). The influence of paratext on narrative persuasion: Fact, fiction, or fake? *Human Communication Research*, 38(4), 459–484. doi: 10.1111/j.1468-2958.2012.01432.x
- Appel, M., & Richter, T. (2007). Persuasive effects of fictional narratives increase over time. *Media Psychology*, 10(1), 113–134. doi: 10.1080/15213260701301194
- Appel, M., & Richter, T. (2010). Transportation and need for affect in narrative persuasion: A mediated moderation model. *Media Psychology*, 13(2), 101–135. doi: 10.1080/15213261003799847
- Argo, J. J., Zhu, R. J., & Dahl, D. W. (2008). Fact or Fiction: An Investigation of Empathy Differences in Response to Emotional Melodramatic Entertainment. *Journal of Consumer Research*, 34(5), 614–623. doi: 10.1086/521907

- Atwood, M. (1985). *The handmaid's tale*. London: Vintage.
- Bal, P. M., & Veltkamp, M. (2013). How does fiction reading influence empathy? An experimental investigation on the role of emotional transportation. *PloS one*, *8*(1), e55341. doi: 10.1371/journal.pone.0055341
- Bandura, A. (1986). *Social foundations of thought and action: A social cognitive theory*. Prentice-Hall, Inc.
- Bar-Haim, Y., Fox, N. A., VanMeenen, K. M., & Marshall, P. J. (2004). Children's narratives and patterns of cardiac reactivity. *Developmental Psychobiology*, *44*(1994), 238–249. doi: 10.1002/dev.20006
- Barreto, M., & Ellemers, N. (2005). The burden of benevolent sexism: How it contributes to the maintenance of gender inequalities. *European Journal of Social Psychology*, *35*(5), 633–642.
- Barreto, M., Ellemers, N., Piebinga, L., & Moya, M. (2009). How nice of us and how dumb of me: The effect of exposure to benevolent sexism on women's task and relational self-descriptions. *Sex Roles*, *62*(7-8), 532–544. doi: 10.1007/s11199-009-9699-0
- Batson, C. D., Chang, J., Orr, R., & Rowland, J. (2002). Empathy, attitudes, and action: Can feeling for a member of a stigmatized group motivate one to help the group? *Personality and Social Psychology Bulletin*, *28*(12), 1656–1666. doi: 10.1177/014616702237647
- Becker, J. C. (2010). Why do women endorse hostile and benevolent sexism? the role of salient female subtypes and internalization of sexist contents. *Sex Roles*, *62*, 453–467. doi: 10.1007/s11199-009-9707-4
- Becker, J. C., & Swim, J. K. (2011). Seeing the unseen: Attention to daily encounters with sexism as way to reduce sexist beliefs. *Psychology of Women Quarterly*, *35*, 227–242. doi: 10.1177/0361684310397509
- Becker, J. C., & Wright, S. C. (2011). Yet another dark side of chivalry: Benevolent sexism undermines and hostile sexism motivates collective action for social change. *Journal*

- of *Personality and Social Psychology*, 101(1), 62–77. doi: 10.1037/a0022615
- Bernat, E., Patrick, C. J., Benning, S. D., & Tellegen, A. (2006). Effects of picture content and intensity on affective physiological response. *Psychophysiology*, 43(1), 93–103. doi: 10.1111/j.1469-8986.2006.00380.x
- Besel, L. D., & Yuille, J. C. (2010). Individual differences in empathy: The role of facial expression recognition. *Personality and Individual Differences*, 49(2), 107–112.
- Bezdek, M. A., & Gerrig, R. J. (2016). When narrative transportation narrows attention: Changes in attentional focus during suspenseful film viewing. *Media Psychology*, 1–30.
- Bigger, J. T., Fleiss, J. L., Rolnitzky, L. M., & Steinman, R. C. (1993). The ability of several short-term measures of rr variability to predict mortality after myocardial infarction. *Circulation*, 88(3), 927–934. doi: 10.1161/01.CIR.88.3.927
- Bilandzic, H., & Busselle, R. W. (2008). Transportation and transportability in the cultivation of genre-consistent attitudes and estimates. *Journal of Communication*, 58(3), 508–529. doi: 10.1111/j.1460-2466.2008.00397.x
- Black, B., Oles, T. P., & Moore, L. (1998). The relationship between attitudes: Homophobia and sexism among social work students. *Affilia*, 13(2), 166–189. doi: 10.1177/088610999801300204
- Blair, I. V., Ma, J. E., & Lenton, A. P. (2001). Imagining stereotypes away: The moderation of implicit stereotypes through mental imagery. *Journal of Personality and Social Psychology*, 81(5), 828–841. doi: 10.1037//0022-3514.81.5.828
- Bonomi, A. E., Altenburger, L. E., & Walton, N. L. (2013). “Double crap!” abuse and harmed identity in fifty shades of grey. *Journal of Women’s Health*, 22(9), 733–44. doi: 10.1089/jwh.2013.4344
- Bonomi, A. E., Nemeth, J. M., Altenburger, L. E., Anderson, M. L., Snyder, A., & Dotto, I. (2014). Fiction or not? Fifty shades is associated with health risks in adolescent and young adult females. *Journal of Women’s Health*, 23(9), 720–8. doi: 10.1089/

jwh.2014.4782

- Braddock, K., & Dillard, J. P. (2016). Meta-analytic evidence for the persuasive effect of narratives on beliefs, attitudes, intentions, and behaviors. *Communication Monographs*. doi: 10.1080/03637751.2015.1128555
- Britton, B. K., Glynn, S. M., Meyer, B. J., & Penland, M. J. (1982). Effects of text structure on use of cognitive capacity during reading. *Journal of Educational Psychology*, 74(1), 51–61. doi: 10.1037/0022-0663.74.1.51
- Brouwer, A.-M., Hogervorst, M., Reuderink, B., van der Werf, Y., & van Erp, J. (2015). Physiological signals distinguish between reading emotional and non-emotional sections in a novel. *Brain-Computer Interfaces*, 2(2-3), 76–89. doi: 10.1080/2326263X.2015.1100037
- Buhrmester, M., Kwang, T., & Gosling, S. D. (2011). Amazon's mechanical turk: A new source of inexpensive, yet high-quality, data? *Perspectives on Psychological Science*, 6(1), 3–5. doi: 10.1177/1745691610393980
- Busselle, R., & Bilandzic, H. (2009). Measuring narrative engagement. *Media Psychology*, 12(4), 321–347. doi: 10.1080/15213260903287259
- Cacioppo, J. T. (1979). Effects of exogenous changes in heart rate on facilitation of thought and resistance to persuasion. *Journal of Personality and Social Psychology*, 37(4), 489–498.
- Cacioppo, J. T., & Petty, R. E. (1979). Effects of message repetition and position on cognitive response, recall, and persuasion. *Journal of Personality and Social Psychology*, 37(1), 97–109.
- Cacioppo, J. T., Petty, R. E., & Kao, C. F. (1984). The efficient assessment of need for cognition. *Journal of Personality Assessment*, 48(3), 306–307.
- Cacioppo, J. T., Sandman, C. A., & Walker, B. B. (1978). The effects of operant heart rate conditioning on cognitive elaboration and attitude change. *Psychophysiology*, 15(4), 330–339.

- Capezza, N. M. (2007). Homophobia and sexism: The pros and cons to an integrative approach. *Integrative Psychological and Behavioral Science*, *41*(3-4), 248–253. doi: 10.1007/s12124-007-9033-8
- Chaiken, S., & Stangor, C. (1987). Attitudes and attitude change. *Annual Review of Psychology*, *38*(1), 575–630.
- Chang, C. (2009). “Being Hooked” by editorial content: The implications for processing narrative advertising. *Journal of Advertising*, *38*(1), 21–34. doi: 10.2753/JOA0091-3367380102
- Christie, I. C., & Friedman, B. H. (2004). Autonomic specificity of discrete emotion and dimensions of affective space: a multivariate approach. *International Journal of Psychophysiology*, *51*(2), 143 – 153.
- Christopher, A. N., & Mull, M. S. (2006). Conservative ideology and ambivalent sexism. *Psychology of Women Quarterly*, *30*(2), 223–230. doi: 10.1111/j.1471-6402.2006.00284.x
- Chung, A. H., & Slater, M. D. (2013). Reducing stigma and out-group distinctions through perspective-taking in narratives. *Journal of Communication*, *63*, n/a–n/a. doi: 10.1111/jcom.12050
- Cohen, J. (2001). Defining identification: A theoretical look at the identification of audiences with media characters. *Mass Communication & Society*, *4*(3), 245–264.
- Conway, M., & Vartanian, L. R. (2000). A status account of gender stereotypes: Beyond communality and agency. *Sex Roles*, *43*(3-4), 181–199.
- Critchley, H. D. (2002). Electrodermal responses: what happens in the brain. *The Neuroscientist*, *8*(2), 132–142. doi: 10.1177/107385840200800209
- Critchley, H. D. (2005). Neural mechanisms of autonomic, affective, and cognitive integration. *Journal of Comparative Neurology*, *493*(1), 154–166. doi: 10.1002/cne.20749
- Cunningham, W. a., Preacher, K. J., & Banaji, M. R. (2001). Research article consistency, stability, and convergent validity. *Psychological Science*, *12*(2), 163–170. doi: 10

- .1111/1467-9280.00328
- Czopp, A. M., & Monteith, M. J. (2003). Confronting prejudice (literally): reactions to confrontations of racial and gender bias. *Personality & social psychology bulletin*, 29(4), 532–44. doi: 10.1177/0146167202250923
- Dal Cin, S., Zanna, M. P., & Fong, G. T. (2004). *Resistance and persuasion*. doi: 10.4324/9781410609816
- Dardenne, B., Dumont, M., & Bollier, T. (2007). Insidious dangers of benevolent sexism: consequences for women's performance. *Journal of Personality and Social Psychology*, 93(5), 764–779. doi: 10.1037/0022-3514.93.5.764
- Davis, M. H. (1983). Measuring individual differences in empathy: Evidence for a multidimensional approach. *Journal of Personality and Social Psychology*, 44(1), 113–126.
- de Graaf, A., Hoeken, H., Sanders, J., & Beentjes, H. (2009). The role of dimensions of narrative engagement in narrative persuasion. *Communications*, 34(4), 385–405. doi: 10.1515/COMM.2009.024
- de Graaf, A., & Hustinx, L. (2011). The effect of story structure on emotion, transportation, and persuasion. *Information Design Journal*, 19(2), 142–154. doi: 10.1075/idj.19.2.05gra
- Djikic, M., Oatley, K., Zoeterman, S., & Peterson, J. B. (2009). Defenseless against art? impact of reading fiction on emotion in avoidantly attached individuals. *Journal of Research in Personality*, 43(1), 14–17. doi: 10.1016/j.jrp.2008.09.003
- Dumont, M., Sarlet, M., & Dardenne, B. (2008). Be too kind to a woman, she'll feel incompetent: Benevolent sexism shifts self-construal and autobiographical memories toward incompetence. *Sex Roles*, 62(7-8), 545–553. doi: 10.1007/s11199-008-9582-4
- Eagly, A. H., & Karau, S. J. (2002). Role congruity theory of prejudice toward female leaders. *Psychological Review*, 109(3), 573.
- Eagly, A. H., & Mladinic, A. (1994). Are people prejudiced against women? some answers from research on attitudes, gender stereotypes, and judgement of competence.

- European Review of Social Psychology*, 5, 1–34. doi: 10.1080/14792779543000002
- Ekman, P., Levenson, R. W., & Friesen, W. V. (1983). Autonomic nervous system activity distinguishes among emotions. *Science*, 221(4616), 1208–1210.
- Escalas, J. E. (2004). Imagine yourself in the product: Mental simulation, narrative transportation, and persuasion. *Journal of Advertising*, 37. doi: 10.2307/4189256
- Escalas, J. E. (2007). Self-referencing and persuasion: Narrative transportation versus analytical elaboration. *Journal of Consumer Research*, 33(4), 421–429. doi: 10.1086/510216
- Ferguson, C. J. (2014). Is reading “banned” books associated with behavior problems in young readers? the influence of controversial young adult books on the psychological well-being of adolescents. *Psychology of Aesthetics, Creativity, and the Arts*, 8(3), 354.
- Field, A. P., & Gillett, R. (2010). How to do a meta-analysis. *British Journal of Mathematical and Statistical Psychology*, 63(3), 665–694.
- Fischer, A. R. (2006). Women’s benevolent sexism as reaction to hostility. *Psychology of Women Quarterly*, 30(4), 410–416. doi: 10.1111/j.1471-6402.2006.00316.x
- Fiske, S. T., Cuddy, A. J. C., Glick, P., & Xu, J. (2002). A model of (often mixed) stereotype content: competence and warmth respectively follow from perceived status and competition. *Journal of Personality and Social Psychology*, 82(6), 878–902. doi: 10.1037/0022-3514.82.6.878
- Flerx, V. C., Fidler, D. S., & Rogers, R. W. (1976). Sex role stereotypes: Developmental aspects and early intervention. *Child Development*, 998–1007.
- Fong, K., Mullin, J. B., & Mar, R. A. (2013). What you read matters: The role of fiction genre in predicting interpersonal sensitivity. *Psychology of Aesthetics, Creativity, and the Arts*, 7(4), 370–376. doi: 10.1037/a0034084
- Fong, K., Mullin, J. B., & Mar, R. A. (2015). How exposure to literary genres relates to attitudes toward gender roles and sexual behavior. *Psychology of Aesthetics, Creativity,*

- and the Arts*, 9(3), 274.
- Foroni, F., & Mayr, U. (2005). The power of a story: New, automatic associations from a single reading of a short scenario. *Psychonomic Bulletin & Review*, 12(1), 139–144.
- Furness, J. B. (2006). The organisation of the autonomic nervous system: Peripheral connections. *Autonomic Neuroscience: Basic and Clinical*, 130(1-2), 1–5. doi: 10.1016/j.autneu.2006.05.003
- Gabriel, S., & Young, A. F. (2011). Becoming a vampire without being bitten: the narrative collective-assimilation hypothesis. *Psychological Science*, 22(8), 990–4. doi: 10.1177/0956797611415541
- Galinsky, A. D., Ku, G., & Wang, C. S. (2005). Perspective-taking and self-other overlap: Fostering social bonds and facilitating social coordination. *Group Processes & Intergroup Relations*, 8(2), 109–124. doi: 10.1177/1368430205051060
- Gambrell, L. B., & Brooks Jawitz, P. (1993). Mental imagery, text illustrations, and children's story comprehension and recall. *Reading Research Quarterly*, 28(3), 264–276.
- Gawronski, B., & Bodenhausen, G. V. (2006). Associative and propositional processes in evaluation: an integrative review of implicit and explicit attitude change. *Psychological Bulletin*, 132(5), 692.
- Gawronski, B., LeBel, E. P., & Peters, K. R. (2007). What do implicit measures tell us? scrutinizing the validity of three common assumptions. *Perspectives on Psychological Science*, 2, 181–193. doi: 10.1111/j.1745-6916.2007.00036.x
- Gerrig, R. J. (1989). Suspense in the absence of uncertainty. *Journal of Memory and Language*, 28(6), 633–648. doi: 10.1016/0749-596X(89)90001-6
- Gerrig, R. J. (1993). Two Metaphors for the Experience of Narrative Worlds. In *Experiencing narrative worlds: On the psychological activities of reading*. (pp. 1–25). doi: 10.1017/CBO9781107415324.004
- Gilbert, D. T. (1991). How mental systems believe. *American Psychologist*, 46(2), 107–

119.

- Gilbert, D. T., Tafarodi, R. W., & Malone, P. S. (1993). You can't not believe everything you read. *Journal of Personality and Social Psychology*, *65*(2), 221–233.
- Glick, P., & Fiske, S. T. (1996). The ambivalent sexism inventory: Differentiating hostile and benevolent sexism. *Journal of Personality and Social Psychology*, *70*(3), 491.
- Glick, P., & Fiske, S. T. (1997). Hostile and Benevolent Sexism. *Psychology of Women Quarterly*, *21*(1), 119–135. doi: 10.1111/j.1471-6402.1997.tb00104.x
- Glick, P., & Fiske, S. T. (2011). Ambivalent sexism revisited. *Psychology of Women Quarterly*, *35*(3), 530–535. doi: 10.1177/0361684311414832
- Glick, P., Lameiras, M., & Castro, Y. R. (2002). Education and catholic religiosity as predictors of hostile and benevolent sexism toward women and men. *Sex Roles*, *47*(9-10), 433–441. doi: 10.1023/A:1021696209949
- Glick, P., Lameiras, M., Fiske, S. T., Eckes, T., Masser, B., Volpato, C., ... Wells, R. (2004). Bad but bold: Ambivalent attitudes toward men predict gender inequality in 16 nations. *Journal of Personality and Social Psychology*, *86*(5), 713.
- Glick, P., Wilkerson, M., & Cuffe, M. (2015). Masculine identity, ambivalent sexism, and attitudes toward gender subtypes. *Social Psychology*, *46*(4), 210–217. doi: 10.1027/1864-9335/a000228
- Gnamb, T., Appel, M., Schreiner, C., Richter, T., & Isberner, M. B. (2014). Experiencing narrative worlds: A latent state-trait analysis. *Personality and Individual Differences*, *69*, 187–192. doi: 10.1016/j.paid.2014.05.034
- Goetz, E. T., Sadoski, M., Stowe, M. L., Fetsco, T. G., & Kemp, S. G. (1993). Imagery and emotional response in reading literary text: Quantitative and qualitative analyses. *Poetics*, *22*(1-2), 35–49. doi: 10.1016/0304-422X(93)90019-D
- Goldstein, T. R. (2009). The pleasure of unadulterated sadness: Experiencing sorrow in fiction, nonfiction, and "in person". *Psychology of Aesthetics, Creativity, and the Arts*, *3*(4), 232–237. doi: 10.1037/a0015343

- Graesser, A. C., Hauff-Smith, K., Cohen, A. D., & Pyles, L. D. (1980). Advanced outlines, familiarity, and text genre on retention of prose. *The Journal of Experimental Education*, 48(4), 281–290. doi: 10.2307/20151355
- Green, M. C. (2004). Transportation into narrative worlds: The role of prior knowledge and perceived realism. *Discourse Processes*, 38(2), 247–266. doi: 10.1207/s15326950dp3802
- Green, M. C. (2008). Research challenges in narrative persuasion. *Information Design Journal*, 16(1), 47–52. doi: 10.1075/idj.16.1.07gre
- 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. doi: 10.1037//0022-3514.79.5.701
- Green, M. C., & Brock, T. C. (2002). In the mind's eye: Transportation-imagery model of narrative persuasion. In M. C. Green, J. J. Strange, & T. C. Brock (Eds.), *Narrative impact: Social and cognitive foundations*. Mahwah N. J: L Erlbaum Associates.
- Green, M. C., Brock, T. C., & Kaufman, G. F. (2004). Understanding media enjoyment: The role of transportation into. *Communication Theory*, 14(4), 311–327.
- Green, M. C., & Clark, J. L. (2013). Transportation into narrative worlds: implications for entertainment media influences on tobacco use. *Addiction*, 108(3), 477–84. doi: 10.1111/j.1360-0443.2012.04088.x
- Green, M. C., & Donahue, J. K. (2009). Simulated worlds: Transportation into narratives. In K. D. Markman, W. M. P. Klein, & J. A. Suhr (Eds.), *Handbook of imagination and mental simulation* (pp. 241–256). New York: Psychology Press.
- Green, M. C., Garst, J., Brock, T. C., & Chung, S. (2006). Fact versus fiction labeling: Persuasion parity despite heightened scrutiny of fact. *Media Psychology*, 8(3), 267–285.
- Green, M. C., Kass, S., Carrey, J., Herzig, B., Feeney, R., & Sabini, J. (2008). Transportation across media: Repeated exposure to print and film. *Media Psychology*, 11(4),

- 512–539. doi: 10.1080/15213260802492000
- Greenwald, A. G., Banaji, M. R., Rudman, L. a., Farnham, S. D., Nosek, B. a., & Mellott, D. S. (2002). A unified theory of implicit attitudes, stereotypes, self-esteem, and self-concept. *Psychological Review*, *109*(1), 3–25. doi: 10.1037/0033-295X.109.1.3
- Greenwald, A. G., Mcghee, D. E., & Schwartz, J. L. K. (1998). Measuring individual differences in implicit cognition: The implicit association test. *Journal of Personality and Social Psychology*, *74*(6), 1464–1480.
- Greenwald, A. G., Poehlman, T. A., Uhlmann, E. L., & Banaji, M. R. (2009). Understanding and using the implicit association test: III. meta-analysis of predictive validity. *Journal of Personality and Social Psychology*, *97*(1), 17.
- Hammond, M. D., & Sibley, C. G. (2011). Why are benevolent sexists happier? *Sex Roles*, *65*(5-6), 332–343.
- Harris, E. A., Thai, M., & Barlow, F. K. (2016). Fifty shades flipped: Effects of reading erotica depicting a sexually dominant woman compared to a sexually dominant man. *The Journal of Sex Research*, *00*(00), 1–12. doi: 10.1080/00224499.2015.1131227
- Hayes, A. F. (2013). *Introduction to mediation, moderation, and conditional process analysis: A regression-based approach*. Guilford Press.
- Hayes, A. F., & Matthes, J. (2009). Computational procedures for probing interactions in ols and logistic regression: Spss and sas implementations. *Behavior Research Methods*, *41*(3), 924–936. doi: 10.3758/BRM.41.3.924
- Heaven, P. C. L., Ciarrochi, J., & Leeson, P. (2011). Cognitive ability, right-wing authoritarianism, and social dominance orientation: A five-year longitudinal study amongst adolescents. *Intelligence*, *39*(1), 15–21. Retrieved from <http://dx.doi.org/10.1016/j.intell.2010.12.001> doi: 10.1016/j.intell.2010.12.001
- Heilman, M. E. (2001). Description and prescription: How gender stereotypes prevent women's ascent up the organizational ladder. *Journal of Social Issues*, *57*(4), 657–674.

- Heller, J. (1961). *Catch-22: A novel*. New York: Simon and Schuster.
- Hill, E. D., Terrell, H. K., Cohen, A. B., & Nagoshi, C. T. (2010). The role of social cognition in the religious fundamentalism-prejudice relationship. *Journal for the Scientific Study of Religion, 49*(4), 724–739.
- Hinyard, L. J., & Kreuter, M. W. (2007). Using narrative communication as a tool for health behavior change: a conceptual, theoretical, and empirical overview. *Health Education & Behavior, 34*(5), 777–92. doi: 10.1177/1090198106291963
- Hoeken, H., & Fijkers, K. M. (2014). Issue-relevant thinking and identification as mechanisms of narrative persuasion. *Poetics, 44*, 84–99. doi: 10.1016/j.poetic.2014.05.001
- Hoeken, H., & van Vliet, M. (2000). Suspense, curiosity, and surprise: How discourse structure influences the affective and cognitive processing of a story. *Poetics, 27*(4), 277–286.
- Hofmann, W., Gawronski, B., Gschwendner, T., Le, H., & Schmitt, M. (2005). A meta-analysis on the correlation between the implicit association test and explicit self-report measures. *Personality and Social Psychology Bulletin, 31*(10), 1369–1385. doi: 10.1177/0146167205275613
- Holmes, E. A., & Mathews, A. (2005). Mental imagery and emotion: A special relationship? *Emotion, 5*(4), 489–497. doi: 10.1037/1528-3542.5.4.489
- Holmes, E. A., Mathews, A., Dalgleish, T., & Mackintosh, B. (2006). Positive interpretation training: Effects of mental imagery versus verbal training on positive mood. *Behavior Therapy, 37*(3), 237–247. doi: 10.1016/j.beth.2006.02.002
- Holmes, E. A., Mathews, A., Mackintosh, B., & Dalgleish, T. (2008). The causal effect of mental imagery on emotion assessed using picture-word cues. *Emotion, 8*(3), 395–409. doi: 10.1037/1528-3542.8.3.395
- Jackson, M. D., & McClelland, J. L. (1975). Sensory and cognitive determinants of reading speed. *Journal of Verbal Learning and Verbal Behavior, 14*(6), 565–574.

doi: 10.1016/S0022-5371(75)80044-2

- Johnson, D. R. (2012). Transportation into a story increases empathy, prosocial behavior, and perceptual bias toward fearful expressions. *Personality and Individual Differences, 52*(2), 150–155. doi: 10.1016/j.paid.2011.10.005
- Johnson, D. R., & Borden, L. A. (2012). Participants at your fingertips: Using amazon's mechanical turk to increase student-faculty collaborative research. *Teaching of Psychology, 39*(4), 245–251. doi: 10.1177/0098628312456615
- Johnson, D. R., Cushman, G. K., Borden, L. A., & McCune, M. S. (2013). Potentiating empathic growth: Generating imagery while reading fiction increases empathy and prosocial behavior. *Psychology of Aesthetics Creativity and the Arts, 7*(3), 306–312. doi: 10.1037/a0033261
- Johnson, D. R., Jasper, D. M., Griffin, S., & Huffman, B. L. (2013). Reading narrative fiction reduces arab-muslim prejudice and offers a safe haven from intergroup anxiety. *Social Cognition, 31*(5), 578–598. doi: 10.1521/soco.2013.31.5.578
- Kaptein, A. A., & Lyons, A. C. (2009). The doctor, the breath and thomas bernhard: using novels in health psychology. *Journal of Health Psychology, 14*(2), 161–70. doi: 10.1177/1359105308100200
- Karniol, R., Gabay, R., Ochion, Y., & Harari, Y. (1998). Is gender or gender-role orientation a better predictor of empathy in adolescence? *Sex Roles, 39*(112), 45–59.
- Keen, S. (2006). A Theory of Narrative Empathy. *Narrative, 14*(3), 207–236. doi: 10.1353/nar.2006.0015
- Keller, P. A., & Block, L. G. (1997). Vividness effects: A resource-matching perspective. *Journal of Consumer Research, 24*(3), 295–304. doi: 10.1086/209511
- Kidd, D. C., & Castano, E. (2013). Reading literary fiction improves theory of mind. *Science, 342*(6156), 377–80. doi: 10.1126/science.1239918
- Knell, S., & Winer, G. A. (1979). Effects of reading content on occupational sex role stereotypes. *Journal of Vocational Behavior, 14*, 78–87.

- Koolhaas, J., Bartolomucci, A., Buwalda, B. D., De Boer, S., Flügge, G., Korte, S., ... Fuchs, E. (2011). Stress revisited: a critical evaluation of the stress concept. *Neuroscience & Biobehavioral Reviews*, 35(5), 1291–1301.
- Krakowiak, K. M., & Oliver, M. B. (2012). When good characters do bad things: Examining the effect of moral ambiguity on enjoyment. *Journal of Communication*, 62, 117–135. doi: 10.1111/j.1460-2466.2011.01618.x
- Kreibig, S. D. (2010). Autonomic nervous system activity in emotion: A review. *Biological Psychology*, 84(3), 394–421.
- Kumkale, G. T., & Albarracin, D. (2004). The sleeper effect in persuasion: A meta-analytic review. *Psychological Bulletin*, 130(1), 143–172. doi: 10.1097/MPG.0b013e3181a15ae8.Screening
- LaMarre, H. L., & Landreville, K. D. (2009). When is Fiction as Good as Fact? Comparing the Influence of Documentary and Historical Reenactment Films on Engagement, Affect, Issue Interest, and Learning. *Mass Communication and Society*, 12, 537–555. doi: 10.1080/15205430903237915
- Lang, P. J. (1979). A bio-informational theory of emotional imagery. *Psychophysical Society*, 16(6), 495–512.
- Lawrence, E. J., Shaw, P., Baker, D., Baron-Cohen, S., & David, A. S. (2004). Measuring empathy: Reliability and validity of the empathy quotient. *Psychological Medicine*, 34(05), 911–920.
- Leavitt, J. D., & Christenfeld, N. J. S. (2011). Story spoilers don't spoil stories. *Psychological Science*, 22(9), 1152–4. doi: 10.1177/0956797611417007
- LeBoutillier, N., & Marks, D. F. (2003). Mental imagery and creativity: A meta-analytic review study. *British Journal of Psychology*, 94(1), 29–44.
- Lehne, M., Engel, P., Rohrmeier, M., Menninghaus, W., Jacobs, A. M., & Koelsch, S. (2015). Reading a suspenseful literary text activates brain areas related to social cognition and predictive inference. *Plos One*, 10(5), e0124550. doi: 10.1371/journal

.pone.0124550

- Levenson, R. W. (2003). Blood, sweat, and fears: The autonomic architecture of emotion. *Annals of the New York Academy of Sciences*, 366, 348–366. doi: 10.1196/annals.1280.016
- Levenson, R. W., & Ruef, A. M. (1992). Empathy: A physiological substrate. *Journal of Personality and Social Psychology*, 63(2), 234–246. doi: <http://dx.doi.org/10.1037/0022-3514.63.2.234>
- Levin, J. R. (1989). A transfer-appropriate-processing perspective of pictures in prose. *Advances in Psychology*, 58, 83–100.
- Levin, J. R., & Lesgold, A. M. (1978). On pictures in prose. *Educational Communication and Technology*, 26(3), 233–243. doi: 10.1007/BF02766607
- Lin, M. H., Kwan, V. S. Y., Cheung, A., & Fiske, S. T. (2005). Stereotype content model explains prejudice for an envied outgroup: Scale of anti-asian american stereotypes. *Personality & Social Psychology Bulletin*, 31(1), 34–47. doi: 10.1177/0146167204271320
- Maass, A., Cadinu, M., Guarnieri, G., & Grasselli, A. (2003). Sexual harassment under social identity threat: the computer harassment paradigm. *Journal of Personality and Social Psychology*, 85(5), 853.
- Maccoby, E. E., Maccoby, N., Romney, A. K., & Adams, J. S. (1961). Social reinforcement in attitude change. *Journal of Abnormal and Social Psychology*, 63(1), 1109–115.
- Malamuth, N. M., & Check, J. V. (1981). The effects of mass media exposure on acceptance of violence against women: A field experiment. *Journal of Research in Personality*, 14, 436–446. doi: 10.1016/0092-6566(81)90040-4
- Mallett, R. K., Ford, T. E., & Woodzicka, J. A. (2016). What did he mean by that? humor decreases attributions of sexism and confrontation of sexist jokes. *Sex Roles*, 75, 272–284. doi: 10.1007/s11199-016-0605-2
- Malliani, A., Lombardi, F., & Pagani, M. (1994). Power spectrum analysis of heart rate

- variability: A tool to explore neural regulatory mechanisms. *British Heart Journal*, 71, 1–2.
- Mar, R. A., Kelley, W. M., Heatherton, T. F., & Macrae, N. C. (2007). Detecting agency from the biological motion of veridical vs animated agents. *Social Cognitive and Affective Neuroscience*, 2(3), 199–205. doi: 10.1093/scan/nsm011
- Mar, R. A., & Oatley, K. (2008). The Function of Fiction is the Abstraction and Simulation of Social Experience. *Perspectives on Psychological Science*, 3(3), 173–192. doi: 10.1111/j.1745-6924.2008.00073.x
- Mar, R. A., Oatley, K., Djikic, M., & Mullin, J. (2011). Emotion and narrative fiction: Interactive influences before, during, and after reading. *Cognition & Emotion*, 25(5), 818–33. doi: 10.1080/02699931.2010.515151
- 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(5), 694–712. doi: 10.1016/j.jrp.2005.08.002
- Mar, R. A., Oatley, K., & Peterson, J. B. (2009). Exploring the link between reading fiction and empathy: Ruling out individual differences and examining outcomes. *Communications*, 34(4), 407–428. doi: 10.1515/COMM.2009.025
- Marks, D. F. (1995). New directions for mental imagery research. *Journal of Mental Imagery*, 19, 153–166.
- Marsh, E. J., & Fazio, L. K. (2006). Learning errors from fiction: Difficulties in reducing reliance on fictional stories. *Memory & Cognition*, 34(5), 1140–1149. doi: 10.3758/BF03193260
- Masser, B., & Abrams, D. (1999). Contemporary sexism. *Psychology of Women Quarterly*, 23(3), 503–517. doi: 10.1111/j.1471-6402.1999.tb00378.x
- Mazzocco, P. J., Green, M. C., Sasota, J. a., & Jones, N. W. (2010). This story is not for everyone: Transportability and narrative persuasion. *Social Psychological and*

- Personality Science*, 1(4), 361–368. doi: 10.1177/1948550610376600
- McManus, I., & Furnham, A. (2006). Aesthetic activities and aesthetic attitudes: influences of education, background and personality on interest and involvement in the arts. *British Journal of Psychology*, 97(Pt 4), 555–87. doi: 10.1348/000712606X101088
- Miller, J. W., Stromeyer, W. R., & Schwieterman, M. a. (2013). Extensions of the Johnson-Neyman technique to linear models with curvilinear effects: Derivations and analytical tools. *Multivariate Behavioral Research*, 48(2), 267–300. doi: 10.1080/00273171.2013.763567
- Mol, S. E., & Bus, A. G. (2011). To read or not to read: A meta-analysis of print exposure from infancy to early adulthood. *Psychological Bulletin*, 137(2), 267–296. doi: 10.1037/a0021890
- Moll, J., Oliveira-souza, R. D., Garrido, G. J., Ivanei, E., Caparelli-daquer, E. M. A., Paiva, M. L. M. F., ... Grafman, J. (2007). The self as a moral agent: Linking the neural bases of social agency and moral sensitivity. *Social Neuroscience*, 2(3-4), 336–352. doi: 10.1080/17470910701392024
- Monfredi, O., Lyashkov, A. E., Johnsen, A.-B., Inada, S., Schneider, H., Wang, R., ... Boyett, M. R. (2014). Biophysical characterization of the underappreciated and important relationship between heart rate variability and heart rate. *Hypertension*, 64(6), 1334–1343.
- Monteith, M. J., Devine, P. G., & Zuwerink, J. R. (1993). Self-directed versus other-directed affect as a consequence of prejudice-related discrepancies. *Journal of Personality and Social Psychology*, 64(2), 198–210.
- Morrison, T. (1987). *Beloved*. New York: Christian Bourgois.
- Moya, M., Glick, P., Expósito, F., De Lemus, S., & Hart, J. (2007). It's for your own good: Benevolent sexism and women's reactions to protectively justified restrictions. *Personality and Social Psychology Bulletin*, 33(10), 1421–1434.
- Moyer-Gusé, E. (2008). Toward a theory of entertainment persuasion: Explaining the

- persuasive effects of entertainment-education messages. *Communication Theory*, 18(3), 407–425. doi: 10.1111/j.1468-2885.2008.00328.x
- Moyer-Gusé, E., & Nabi, R. L. (2010). Explaining the effects of narrative in an entertainment television program: Overcoming resistance to persuasion. *Human Communication Research*, 36(1), 26–52. doi: 10.1111/j.1468-2958.2009.01367.x
- Murphy, S. T., Frank, L. B., Moran, M. B., & Patnoe-Woodley, P. (2011). Involved, transported, or emotional? Exploring the determinants of change in knowledge, attitudes, and behavior in entertainment-education. *Journal of Communication*, 61(3), 407–431. doi: 10.1111/j.1460-2466.2011.01554.x
- Nabi, R. L., & Green, M. C. (2014). The role of a narrative's emotional flow in promoting persuasive outcomes. *Media Psychology*, 1–26. doi: 10.1080/15213269.2014.912585
- Nagoshi, J. L., Adams, K. A., Terrell, H. K., Hill, E. D., Brzuzy, S., & Nagoshi, C. T. (2008). Gender differences in correlates of homophobia and transphobia. *Sex Roles*, 59, 521–531. doi: 10.1007/s11199-008-9458-7
- Newman, E. J., Garry, M., Bernstein, D. M., Kantner, J., & Lindsay, D. S. (2012). Non-probative photographs (or words) inflate truthiness. *Psychonomic Bulletin & Review*, 19(5), 969–974.
- Nicol, A. A. M., & Rounding, K. (2013). Alienation and empathy as mediators of the relation between social dominance orientation, right-wing authoritarianism and expressions of racism and sexism. *Personality and Individual Differences*, 55(3), 294–299. doi: 10.1016/j.paid.2013.03.009
- Oatley, K. (1999). Why fiction may be twice as true as fact: Fiction as cognitive and emotional simulation. *Review of General Psychology*, 3(2), 101–117.
- Oatley, K., Green, M. C., Strange, J. J., & Brock, T. C. (2002). Emotions and the story worlds of fiction. In *Narrative impact: Social and cognitive foundations* (pp. 39–69). Mahwah N. J: L Erlbaum Associates.

- Obama, B. (2015, November 19). President Obama & Marilynne Robinson: A Conversation—II. *The New York Review of Books*. <http://www.nybooks.com>.
- Oliveira Laux, S. H., Ksenofontov, I., & Becker, J. C. (2015). Explicit but not implicit sexist beliefs predict benevolent and hostile sexist behavior. *European Journal of Social Psychology, 45*, 702–715.
- Orwell, G. (1949). *Nineteen eighty-four*. London: Secker and Warburg.
- Paas, F. G. W. C., Van Merriënboer, J. J. G., & Adam, J. J. (1994). Measurement of cognitive load in instructional research. *Perceptual and Motor Skills, 79*, 419–430. doi: 10.2466/pms.1994.79.1.419
- Paluck, E. L. (2009). Reducing intergroup prejudice and conflict using the media: a field experiment in Rwanda. *Journal of Personality and Social Psychology, 96*(3), 574–87. doi: 10.1037/a0011989
- Paolacci, G., & Chandler, J. (2014). Inside the Turk: Understanding Mechanical Turk as a participant pool. *Current Directions in Psychological Science, 23*(3), 184–188. doi: 10.1177/0963721414531598
- Park, J., & Banaji, M. R. (2000). Mood and heuristics: The influence of happy and sad states on sensitivity and bias in stereotyping. *Attitudes and Social Cognition, 78*(6), 1005–1023. doi: 10.1037//0022-3514.78.6.1005
- Pearson, J., Naselaris, T., Holmes, E. A., & Kosslyn, S. M. (2015). Mental imagery: Functional mechanisms and clinical applications. *Trends in Cognitive Sciences, 19*(10), 590–602.
- Pennebaker, J. W., Booth, R. J., & Francis, M. E. (2007). Linguistic inquiry and word count: LIWC [computer software]. Austin, TX: *liwc.net*.
- Petrova, P. K., & Cialdini, R. B. (2008). Evoking the imagination as a strategy of influence. *Handbook of Consumer Psychology, 505–523*.
- Pettigrew, T. F., & Tropp, L. R. (2008). How does intergroup contact reduce prejudice? Meta-analytic tests of three mediators. *European Journal of Social Psychology, 38*(2), 175–183. doi: 10.1002/ejsp.554

- 38(6), 922–934.
- Petty, R. E., & Cacioppo, J. T. (1984). The effects of involvement on responses to argument quantity and quality: Central and peripheral routes to persuasion. *Journal of Personality and Social Psychology*, 46(1), 69.
- Petty, R. E., Cacioppo, J. T., & Schumann, D. (1983). Central and peripheral routes to advertising effectiveness: The moderating role of involvement. *Journal of Consumer Research*, 10(2), 135–146. doi: 10.2307/2488919
- Pino, M. C., & Mazza, M. (2016). The Use of “Literary Fiction” to Promote Mentalizing Ability. *PLoS ONE*, 11(8), 1–14. Retrieved from <http://dx.doi.org/10.1371/journal.pone.0160254> doi: 10.1371/journal.pone.0160254
- Pratto, F., Sidanius, J., Stallworth, L. M., & Malle, B. F. (1994). Social dominance orientation: A personality variable predicting social and political attitudes. *Journal of Personality and Social Psychology*, 67(4), 741–763. doi: 10.1037/0022-3514.67.4.741
- Prentice, D. A., Gerrig, R. J., & Ballis, D. S. (1997). What readers bring to the processing of fictional texts. *Psychonomic Bulletin & Review*, 4(3), 416–420.
- Prieto-Pablos, J. A. (1998). The paradox of suspense. *Poetics*, 26, 99–113. doi: 10.1080/14616700601056874
- Prkachin, K. M., Williams-avery, R. M., Zwaal, C., & Mills, D. E. (1999). Cardiovascular changes during induced emotion: An application of Lang’s theory of emotional imagery. *Journal of Psychosomatic Research*, 47(3), 255–267.
- Pumpirla, J., Howorka, K., Groves, D., Chester, M., & Nolan, J. (2002). Functional assessment of heart rate variability: Physiological basis and practical applications. *International Journal of Cardiology*, 84, 1–14.
- Qualtrics. (2005). <http://www.qualtrics.com>. Provo, Utah USA.
- Quintero Johnson, J. M., & Sangalang, A. (2016). Testing the explanatory power of two measures of narrative involvement : An investigation of the influence of transportation and narrative engagement on the process of narrative persuasion. *Media*

- Psychology*, 3269(September), 1–30. doi: 10.1080/15213269.2016.1160788
- Rajendra Acharya, U., Paul Joseph, K., Kannathal, N., Lim, C. M., & Suri, J. S. (2006). Heart rate variability: A review. *Medical and Biological Engineering and Computing*, 44(12), 1031–1051. doi: 10.1007/s11517-006-0119-0
- Ramos, M. R., Barreto, M., Ellemers, N., Moya, M., Ferreira, L., & Calanchini, J. (2015). Exposure to sexism can decrease implicit gender stereotype bias. *European Journal of Social Psychology*, 00(00), 00.
- Richter, T., Appel, M., & Calio, F. (2013). Stories can influence the self-concept. *Social Influence*, 9(3), 172–188. doi: 10.1080/15534510.2013.799099
- Richter, T., Schroeder, S., & Wöhrmann, B. (2009). You don't have to believe everything you read: Background knowledge permits fast and efficient validation of information. *Journal of Personality and Social Psychology*, 96(3), 538–558. doi: 10.1037/a0014038
- Rosenbaum, J. E., Johnson, B. K., & Rosenbaum, J. E. (2015). Who's afraid of spoilers? Need for cognition, need for affect, and narrative selection and enjoyment. *Psychology of Popular Media Culture*.
- Rudman, L. A., & Fetterolf, J. C. (2014). How accurate are metaperceptions of sexism? Evidence for the illusion of antagonism between hostile and benevolent sexism. *Group Processes & Intergroup Relations*, 17(3), 275–285. doi: 10.1177/1368430213517272
- Rudman, L. A., & Glick, P. (2001). Prescriptive gender stereotypes and backlash toward agentic women. *Journal of Social Issues*, 57(4), 743–762.
- Rudman, L. A., & Kilianski, S. E. (2000). Implicit and explicit attitudes toward female authority. *Personality and Social Psychology Bulletin*, 26(11), 1315–1328.
- Rudman, L. A., Moss-Racusin, C. A., Phelan, J. E., & Nauts, S. (2012). Status incongruity and backlash effects: Defending the gender hierarchy motivates prejudice against female leaders. *Journal of Experimental Social Psychology*, 48(1), 165–179.

- Ryan, M. L. (2007). Diagramming narrative. *Semiotica*, *165*(2007), 11–40. doi: 10.1515/SEM.2007.030
- Sahni, R. (2012). Noninvasive monitoring by photoplethysmography. *Clinics in Perinatology*, *39*(3), 573–583. doi: 10.1016/j.clp.2012.06.012
- Sassenberg, K., & Moskowitz, G. B. (2005). Don't stereotype, think different! overcoming automatic stereotype activation by mindset priming. *Journal of Experimental Social Psychology*, *41*(5), 506–514.
- Saunders, B. A., Scaturro, C., Guarino, C., & Kelly, E. (2016). Contending with catcalling: The role of system-justifying beliefs and ambivalent sexism in predicting women's coping experiences with (and men's attributions for) stranger harassment. *Current Psychology*. doi: 10.1007/s12144-016-9421-7
- Scales, A. M., & Rhee, O. (2001). Adult reading habits and patterns. *Reading Psychology*, *22*(3), 175–203. doi: 10.1080/027027101753170610
- Schiappa, E., Gregg, P. B., & Hewes, D. E. (2005). The parasocial contact hypothesis. *Communication Monographs*, *72*(1), 92–115. doi: 10.1080/0363775052000342544
- Schnabel, K., Asendorpf, J. B., & Greenwald, A. G. (2008). Assessment of individual differences in implicit cognition: A review of IAT measures. *European Journal of Psychological Assessment*, *24*, 210–217. doi: 10.1027/1015-5759.24.4.210
- Schwartz, G. E., Weinberger, D. A., & Singer, J. A. (1981). Cardiovascular differentiation of happiness, sadness, anger, and fear following imagery and exercise. *Psychosomatic Medicine*, *43*(4), 343–364.
- Scott, K. P. (1986). Effects of sex-fair reading materials on pupils' attitudes, comprehension, and interest. *American Educational Research Journal*, *23*(1), 105–116. doi: 10.3102/00028312023001105
- Sestir, M., & Green, M. C. (2010). You are who you watch: Identification and transportation effects on temporary self-concept. *Social Influence*, *5*(4), 272–288. doi: 10.1080/15534510.2010.490672

- Shaffer, F., McCraty, R., & Zerr, C. L. (2014). A healthy heart is not a metronome: An integrative review of the heart's anatomy and heart rate variability. *Frontiers in Psychology, 5*, 1040.
- Shedlosky-Shoemaker, R., Costabile, K. A., & Arkin, R. M. (2014). Self-expansion through fictional characters. *Self and Identity, 13*(5), 556–578. doi: 10.1080/15298868.2014.882269
- Sibley, C. G., Wilson, M. S., & Duckitt, J. (2007). Antecedents of men's hostile and benevolent sexism: The dual roles of social dominance orientation and right-wing authoritarianism. *Personality & Social Psychology Bulletin, 33*(2), 160–172. doi: 10.1177/0146167206294745
- Singer, T., & Lamm, C. (2009). The social neuroscience of empathy. *Annals of the New York Academy of Sciences, 1156*(1), 81–96.
- Slater, M. D., Rouner, D., & Long, M. (2006). Television dramas and support for controversial public policies: Effects and mechanisms. *Journal of Communication, 56*(2), 235–252. doi: 10.1111/j.1460-2466.2006.00017.x
- Sloan, R. P., Shapiro, P. a., Bagiella, E., Myers, M. M., Bigger, J. T., Steinman, R. C., & Gorman, J. M. (1994). Brief interval heart period variability by different methods of analysis correlates highly with 24 h analyses in normals. *Biological Psychology, 38*(2-3), 133–142. doi: 10.1016/0301-0511(94)90034-5
- Stanovich, K. E., & Cunningham, A. E. (1992). Studying the consequences of literacy within a literate society: The cognitive correlates of print exposure. *Memory & Cognition, 20*(1), 51–68. doi: 10.3758/BF03208254
- Stanovich, K. E., & Cunningham, A. E. (1993). Where does knowledge come from? Specific associations between print exposure and information acquisition. *Journal of Educational Psychology, 85*(2), 211–229. doi: 10.1037/0022-0663.85.2.211
- Stevenson, M. R., & Medler, B. R. (1995). Is homophobia a weapon of sexism? *Journal of Men's Studies, 4*(1), 1.

- Stowe, H. B. (1852). *Uncle tom's cabin*. Boston: John P. Jewitt.
- Strange, J. J. (2002). How fictional tales wag real-world beliefs. In M. C. Green, J. J. Strange, & T. C. Brock (Eds.), *Narrative impact: Social and cognitive foundations*. Mahwah, N.J: L Erlbaum Associates.
- Strange, J. J., & Leung, C. C. (1999). How anecdotal accounts in news and in fiction can influence judgments of a social problem's urgency, causes, and cures. *Personality and Social Psychology Bulletin*, 25(4), 436–449. doi: 10.1177/0146167299025004004
- Swim, J. K., Aikin, K. J., Hall, W. S., & Hunter, B. A. (1995). Sexism and racism: Old-fashioned and modern prejudices. *Journal of Personality and Social Psychology*, 68(2), 199–214. doi: 10.1037/0022-3514.68.2.199
- Swim, J. K., Mallett, R., Russo-Devosa, Y., & Stangor, C. (2005). Judgments of sexism: A comparison of the subtlety of sexism measures and sources of variability in judgments of sexism. *Psychology of Women Quarterly*, 29(4), 406–411. doi: 10.1111/j.1471-6402.2005.00240.x
- Sztajzel, J. (2004). Heart rate variability: A noninvasive electrocardiographic method to measure the autonomic nervous system. *Swiss Medical Weekly*, 134, 514–522.
- Tal-Or, N., & Cohen, J. (2010). Understanding audience involvement: Conceptualizing and manipulating identification and transportation. *Poetics*, 38(4), 402–418. doi: 10.1016/j.poetic.2010.05.004
- Tarvainen, M. P., Niskanen, J.-P., Lipponen, J. A., Ranta-aho, P. O., & Karjalainen, P. A. (2014). Kubios {HRV} – heart rate variability analysis software. *Computer Methods and Programs in Biomedicine*, 113(1), 210 – 220. doi: <http://dx.doi.org/10.1016/j.cmpb.2013.07.024>
- Task Force of The European Society of Cardiology. (1996). Guidelines heart rate variability. *European Heart Journal*, 17, 354–381. doi: 10.1161/01.CIR.93.5.1043
- Tavares, P., Lawrence, A. D., & Barnard, P. J. (2008). Paying attention to social meaning: An fMRI study. *Cerebral Cortex*, 18(8), 1876–1885. doi: 10.1093/cercor/bhm212

- Thayer, J. F., Hansen, A. L., Saus-rose, E., & Johnsen, B. H. (2009). Heart rate variability, prefrontal neural function, and cognitive performance: The neurovisceral integration perspective on self-regulation, adaptation, and health. *Annals of Behavioural Medicine, 37*, 141–153. doi: 10.1007/s12160-009-9101-z
- Tibbetts, S.-L. (1978). Wanted: Data to prove that sexist reading material has an impact on the reader. *The Reading Teacher, 32*(2), 165–169.
- Tukachinsky, R. (2014). Experimental manipulation of psychological involvement with media. *Communication Methods and Measures, 8*(1), 1–33. doi: 10.1080/19312458.2013.873777
- Tun, P. A. (1989). Age differences in processing expository and narrative text. *Journal of Gerontology, 44*(1), 9–15. doi: 10.1093/geronj/44.1.P9
- van Laer, T., de Ruyter, K., Visconti, L. M., & Wetzels, M. (2014). The extended transportation-imagery model: A meta-analysis of the antecedents and consequences of consumers' narrative transportation. *Journal of Consumer Research, 40*(5), 797–817. doi: 10.1086/673383
- van Reenen, D. (2014). Is this really what women want? An analysis of fifty shades of grey and modern feminist thought. *South African Journal of Philosophy, 33*(2), 223–233. doi: 10.1080/02580136.2014.925730
- Vezzali, L., Stathi, S., Giovannini, D., Capozza, D., & Trifiletti, E. (2014). The greatest magic of harry potter: Reducing prejudice. *Journal of Applied Social Psychology, n/a–n/a*. doi: 10.1111/jasp.12279
- Wallentin, M., Nielsen, A. H., Vuust, P., Dohn, A., Roepstorff, A., & Lund, T. E. (2011). Amygdala and heart rate variability responses from listening to emotionally intense parts of a story. *NeuroImage, 58*(3), 963 – 973. doi: <http://dx.doi.org/10.1016/j.neuroimage.2011.06.077>
- West, R. F., Stanovich, K. E., & Mitchell, H. R. (1993). Reading in the real world and its correlates. *Reading Research Quarterly, 28*(1), 34–50.

- Wheeler, C., Green, M. C., & Brock, T. C. (1999). Fictional narratives change beliefs: Replications of prentice, gerrig, and bailis (1997) with mixed corroboration. *Psychonomic Bulletin & Review*, *6*(1), 136–141. doi: 10.3758/BF03210821
- Zell, E., Strickhouser, J. E., Lane, T. N., & Teeter, S. R. (2016). Mars, venus, or earth? Sexism and the exaggeration of psychological gender differences. *Sex Roles*, *75*(7), 287–300. doi: 10.1007/s11199-016-0622-1
- Zwarun, L., & Hall, A. (2012). Narrative persuasion, transportation, and the role of need for cognition in online viewing of fantastical films. *Media Psychology*, *15*(3), 327–355. doi: 10.1080/15213269.2012.700592

Appendices

Appendix A: Author Recognition Task

Study ID:

Below you will see a list of 140 names. Some of the people in the list are popular writers and some are not.

You are to read the names and select those individuals **who you know to be writers**. Some of the names are people who are not popular writers so guessing can easily be detected.

- | | | |
|---|--|--|
| <input type="checkbox"/> Sinclair Ross | <input type="checkbox"/> Jim Collins | <input type="checkbox"/> Ray Bradbury |
| <input type="checkbox"/> Ursula K Le Guin | <input type="checkbox"/> Robert Inness | <input type="checkbox"/> Dean Koontz |
| <input type="checkbox"/> Diane Cuneo | <input type="checkbox"/> Ernst Mayr | <input type="checkbox"/> Lauren Adamson |
| <input type="checkbox"/> Hilda Borko | <input type="checkbox"/> Naomi Wolf | <input type="checkbox"/> Antonio Damasio |
| <input type="checkbox"/> John Irving | <input type="checkbox"/> Douglas Rushkoff | <input type="checkbox"/> Reed Larson |
| <input type="checkbox"/> Pierre Berton | <input type="checkbox"/> Amy Tan | <input type="checkbox"/> Patricia Cornwell |
| <input type="checkbox"/> Aimee Dorr | <input type="checkbox"/> Jean Baudrillard | <input type="checkbox"/> Deepak Chopra |
| <input type="checkbox"/> K Warner Schaie | <input type="checkbox"/> Philip C McGraw | <input type="checkbox"/> Oliver Sacks |
| <input type="checkbox"/> Bob Woodward | <input type="checkbox"/> Douglas Adams | <input type="checkbox"/> Robert Emery |
| <input type="checkbox"/> Clive Cussler | <input type="checkbox"/> Peter S Pande | <input type="checkbox"/> Michael Moore |
|
 | | |
| <input type="checkbox"/> David Perry | <input type="checkbox"/> Dale Blyth | <input type="checkbox"/> John Saul |
| <input type="checkbox"/> Robert Ludlum | <input type="checkbox"/> Judith Krantz | <input type="checkbox"/> Jackie Collins |
| <input type="checkbox"/> Yukio Mishima | <input type="checkbox"/> Roland Barthes | <input type="checkbox"/> Frank Gresham |
| <input type="checkbox"/> Albert Camus | <input type="checkbox"/> Piers Anthony | <input type="checkbox"/> John Maynard Smith |
| <input type="checkbox"/> Scott Paris | <input type="checkbox"/> Miriam Sexton | <input type="checkbox"/> Robert D Kaplan |
| <input type="checkbox"/> Carl Corter | <input type="checkbox"/> Stephen R Covey | <input type="checkbox"/> Margaritia Azmitia |
| <input type="checkbox"/> Diana Palmer | <input type="checkbox"/> W Patrick Dickson | <input type="checkbox"/> Kenneth H Blanchard |
| <input type="checkbox"/> Naomi Klein | <input type="checkbox"/> Susan Sontag | <input type="checkbox"/> Steve Yussen |
| <input type="checkbox"/> Nicholas Sparks | <input type="checkbox"/> Elliot Blass | <input type="checkbox"/> Sidney Sheldon |
| <input type="checkbox"/> John Updike | <input type="checkbox"/> Edward Cornell | <input type="checkbox"/> Joy Fielding |
| <input type="checkbox"/> Robert Fulghum | <input type="checkbox"/> Frank Keil | <input type="checkbox"/> Peter F Drucker |
|
 | | |
| <input type="checkbox"/> Toni Morrison | <input type="checkbox"/> John Le Carré | <input type="checkbox"/> Joseph LeDoux |
| <input type="checkbox"/> Napoleon Hill | <input type="checkbox"/> Robert Jordan | <input type="checkbox"/> Arthur C Clark |
| <input type="checkbox"/> Italo Calvino | <input type="checkbox"/> Noam Chomsky | <input type="checkbox"/> Bertrand Russell |
| <input type="checkbox"/> Lynn Liben | <input type="checkbox"/> Stephen J Gould | <input type="checkbox"/> Paulo Coelho |

Study ID:

- | | | |
|--|---|---|
| <input type="checkbox"/> Martin Ford | <input type="checkbox"/> Jean Vanier | <input type="checkbox"/> Morton Mendelson |
| <input type="checkbox"/> W O Mitchell | <input type="checkbox"/> Robert T Kiyosaki | <input type="checkbox"/> William Gibson |
| <input type="checkbox"/> Richard Dawkins | <input type="checkbox"/> Marianne Williamson | <input type="checkbox"/> Hugh Lytton |
| <input type="checkbox"/> Amir D Aczel | <input type="checkbox"/> Jeffery Gray | <input type="checkbox"/> Iris Johansen |
| <input type="checkbox"/> Richard Passman | <input type="checkbox"/> P D James | <input type="checkbox"/> Eric Schlosser |
| | | |
| <input type="checkbox"/> Thomas Bever | <input type="checkbox"/> Carol Shields | <input type="checkbox"/> Faith Popcorn |
| <input type="checkbox"/> Erma Bombeck | <input type="checkbox"/> James Morgan | <input type="checkbox"/> Terry Goodkind |
| <input type="checkbox"/> Eric Amsel | <input type="checkbox"/> John Searle | <input type="checkbox"/> Mark Strauss |
| <input type="checkbox"/> W G Sebald | <input type="checkbox"/> Jack Canfield | <input type="checkbox"/> Alice Munro |
| <input type="checkbox"/> M D Johnson Spencer | <input type="checkbox"/> Nora Roberts | <input type="checkbox"/> Thomas Kuhn |
| <input type="checkbox"/> Franklin Manis | <input type="checkbox"/> Sue Grafton | <input type="checkbox"/> Catherine Anderson |
| <input type="checkbox"/> Frances Fincham | <input type="checkbox"/> Umberto Eco | <input type="checkbox"/> Milan Kundera |
| <input type="checkbox"/> Danielle Steele | <input type="checkbox"/> Thomas Mann | <input type="checkbox"/> Terry Brooks |
| <input type="checkbox"/> Oscar Barbarin | <input type="checkbox"/> Stephen Hawking | <input type="checkbox"/> Michel Foucault |
| <input type="checkbox"/> Ian Rankin | <input type="checkbox"/> Norman Mailer | <input type="checkbox"/> Reuben Baron |
| | | |
| <input type="checkbox"/> Alister Younger | <input type="checkbox"/> Barry Z Posner | <input type="checkbox"/> Stephen C Lundin |
| <input type="checkbox"/> Diana Ackerman | <input type="checkbox"/> Denise Daniels | <input type="checkbox"/> Geraldine Dawson |
| <input type="checkbox"/> Anne McCaffrey | <input type="checkbox"/> Matt Ridley | <input type="checkbox"/> Harold Gardin |
| <input type="checkbox"/> Melody Beattie | <input type="checkbox"/> M Scott Peck | <input type="checkbox"/> José Saramago |
| <input type="checkbox"/> Ken Follett | <input type="checkbox"/> Maeve Binchy | <input type="checkbox"/> Gary Beaucamp |
| <input type="checkbox"/> Robert Siegler | <input type="checkbox"/> John Condry | <input type="checkbox"/> Daniel Goleman |
| <input type="checkbox"/> Rohinton Mistry | <input type="checkbox"/> Gabriel Garcia Marquez | |

- Check this box if you do not recognise any authors

Appendix B: Transportability Scale (Dal Cin, Zanna, & Fong, 2004)

When reading for pleasure:

1	2	3	4	5	6	7	8	9
Strongly Disagree								Strongly Agree

1. I can easily envision the events in the story.
2. I find I can easily lose myself in the story.
3. I find it difficult to tune out activity around me.
4. I can easily envision myself in the events described in a story.
5. I get mentally involved in the story.
6. I can easily put stories out of my mind after I've finished reading them.
7. I sometimes feel as if I am part of the story.
8. I am often impatient to find out how a story ends.
9. I find that I can easily take the perspective of the character(s) in the story.
10. I am often emotionally affected by what I've read.
11. I have vivid images of the characters.
12. I find myself accepting events that I might have otherwise considered unrealistic.
13. I find myself thinking what the characters may be thinking.
14. I find myself thinking of other ways the story could have ended.
15. My mind often wanders.
16. I find myself feeling what the characters may feel.
17. I find that events in the story are relevant to my everyday life.
18. I often find that reading stories has an impact on the way I see things.
19. I easily identify with characters in the story.

20. I have vivid images of the events in the story.

Items 3, 6, and 15 are reverse scored

Appendix C: Ambivalent Sexism Inventory (Glick & Fiske, 1996)

Below are a series of statements concerning men and women and their relationships in contemporary society. Please indicate the degree to which you agree or disagree with each statement using the scale below.

0	1	2	3	4	5
Disagree					Agree
Strongly					Strongly

1. No matter how accomplished he is, a man is not truly complete as a person unless he has the love of a woman.
2. Many women are actually seeking special favors, such as hiring policies that favour them over men, under the guise of asking for 'equality'.
3. In a disaster, women ought not necessarily to be rescued before men.
4. Most women interpret innocent remarks or acts as being sexist.
5. Women are too easily offended.
6. People are often truly happy in life without being romantically involved with a member of the opposite sex.
7. Feminists are not seeking for women to have more power than men.
8. Many women have a quality of purity that few men possess.
9. Women should be cherished and protected by men.
10. Most women fail to appreciate fully all that men do for them.

11. Women seek to gain power by getting control over men.
12. Every man ought to have a woman whom he adores.
13. Men are complete without women.
14. Women exaggerate problems they have at work.
15. Once a woman gets a man to commit to her, she usually tries to put him on a tight leash.
16. When women lose to men in a fair competition, they typically complain about being discriminated against.
17. A good woman should be set on a pedestal by her man.
18. There are actually very few women who get a kick out of teasing men by seeming sexually available and then refusing male advances.
19. Women, compared to men, tend to have a superior moral sensibility.
20. Men should be willing to sacrifice their own well-being in order to provide financially for the women in their lives.
21. Feminists are making entirely reasonable demands of men.
22. Women, as compared to men, tend to have a more refined sense of culture and good taste.

Scoring: For an overall measurement of sexism the average of all items. The hostility and benevolent sexism subscales can also be calculated separately by averaging these items.

Hostile sexism scale: Questions 2,4,5,7,10,11,14,15,16,18,21.

Benevolent sexism scale: Questions 1,3,6,8,9,12,13,17,19,20.

Items 3,6,7,13,18,21 are reverse scored

Appendix D: Demographics

What genre of reading do you prefer? Select all that apply.

- Romance
- Suspense/thriller
- Humour/comedy
- Horror
- Science Fiction/fantasy
- General Fiction
- Autobiography/biography
- Non-Fiction
- Historical Fiction
- Other

How often do you read for pleasure?

- Never
- Less than Once a Month
- Once a Month
- 2-3 Times a Month
- Once a Week
- 2-3 Times a Week
- Daily

How many books do you read in a year?

- 0
- 1-9
- 10-19
- 20-29
- 30+

Appendix E: Need for Cognition Scale (Cacioppo, Petty, & Kao, 1984)

1	2	3	4	5
Extremely uncharacteristic of you				Extremely characteristic of you
<ol style="list-style-type: none"> 1. I prefer complex to simple problems. 2. I like to have the responsibility of handling a situation that requires a lot of thinking. 3. Thinking is not my idea of fun. 4. I would rather do something that requires little thought rather than something that is sure to challenge my thinking abilities. 5. I try to anticipate and avoid situations where there is a likely chance I will have to think in depth about something. 6. I find satisfaction in deliberating hard for long hours. 7. I only think as hard as I have to. 8. I prefer to think about small daily projects to long-term ones. 9. I like tasks that require little thought once I've learned them. 10. The idea of relying on thought to make my way to the top appeals to me. 11. I really enjoy a task that involves coming up with new solutions to problems. 12. Learning new ways to think doesn't excite me very much. 13. I prefer my life to be filled with puzzles that I must solve. 14. The notion of thinking abstractly is appealing to me. 15. I would prefer a task that is intellectual, difficult, and important to one that is somewhat important but does not require much thought. 16. I feel relief rather than satisfaction after completing a task that required a lot of mental effort. 17. It's enough for me that something gets the job done; I don't care how or why it works. 18. I usually end up deliberating about issues even when they do not affect me personally. 				

Items 3, 4, 5, 7, 8, 9, 12, 16, 17 are reverse scored

Appendix F: Interpersonal Reactivity Index

The following statements inquire about your thoughts and feelings in a variety of situations. For each item, indicate how well it describes you by choosing the appropriate letter on the scale at the top of the page: from A (does not describe me well) to E (describes me very well). When you have decided on your answer, select the letter for that item number. **READ EACH ITEM CAREFULLY BEFORE RESPONDING.** Answer as honestly as you can. Thank you.

A	B	C	D	E
Does describe well	not me			Describes very well

1. I day dream and fantasize, with some regularity, about things that might happen to me
2. I often have tender, concerned feelings for people less fortunate than me
3. I sometimes find it difficult to see things from the "other guy's" point of view
4. Sometimes I don't feel very sorry for other people when they are having problems
5. I really get involved with the feelings of the characters in a novel
6. In emergency situations, I feel apprehensive and ill-at-ease
7. I am usually objective when I watch a movie or play, and I don't often get completely caught up in it
8. I try to look at everybody's side of a disagreement before I make a decision
9. When I see someone being taken advantage of, I feel kind of protective towards them
10. I sometimes feel helpless when I am in the middle of a very emotional situation
11. I sometimes try to understand my friends better by imagining how things look from their perspective
12. Becoming extremely involved in a good book or movie is somewhat rare for me
13. When I see someone get hurt, I tend to remain calm
14. Other people's misfortunes do not usually disturb me a great deal
15. If I'm sure I'm right about something, I don't waste much time listening to other people's arguments
16. After seeing a play or movie, I have felt as though I were one of the characters

17. Being in a tense emotional situation scares me
18. When I see someone being treated unfairly, I sometimes don't feel very much pity for them
19. I am usually pretty effective in dealing with emergencies
20. I am often touched by things that I see happen
21. I believe that there are two sides to every question and try to look at them both
22. I would describe myself as a pretty soft-hearted person
23. When I watch a good movie, I can easily put myself in the place of a leading character
24. I tend to lose control during emergencies
25. When I am upset at someone, I usually try to "put myself in their shoes" for a while
26. When I am reading an interesting story or novel, I imagine how I would feel if the events in the story were happening to me
27. When I see someone who badly needs help in an emergency, I go to pieces
28. Before criticizing somebody, I try to imagine how I would feel if I were in their place

Items 3, 4, 7, 12, 13, 14, 15, 18, 19 are reverse scored.

Appendix G: Readings

The Handmaid's Tale (Atwood, 1985)

Gender-relevant Condition (Study 2 to 4)

I don't feel like a nap this afternoon, there's still too much adrenaline. I sit on the window seat, looking out through the semi-sheer of the curtains. White nightgown. The window is as open as it goes, there's a breeze, hot in the sunlight, and the white cloth blows across my face. From the outside I must look like a cocoon, a spook, face enshrouded like this, only the outlines visible, of nose, bandaged mouth, blind eyes. But I like the sensation, the soft cloth brushing my skin. It's like being in a cloud.

They've given me a small electric fan, which helps in this humidity. It whirs on the floor, in the corner, its blades encased in grille-work. If I were Moira, I'd know how to take it apart, reduce it to its cutting edges. I have no screwdriver, but if I were Moira I could do it without a screwdriver. I'm not Moira.

I use to work transferring books to computer discs, to cut down on storage space and replacement costs, they said. Discers, we called ourselves. We called the library a discotheque, which was a joke of ours. After the books were transferred they were supposed to go to the shredder, but sometimes I took them home with me. I liked the feel of them, and the look. Luke said I had the mind of an antiquarian. He liked that, he liked old things himself.

It's strange, now, to think about having a job. *Job*. It's a funny word.

It's a job for a man. Do a jobbie, they'd say to children when they were being toilet trained. Or of dogs: he did a job on the carpet. You were supposed to hit them with rolled-up newspapers, my mother said. I can remember when there were newspapers, though I never had a dog, only cats.

The Book of Job.

All those women having jobs: hard to imagine, now, but thousands of them had jobs, millions. It was considered the normal thing. Now it's like remembering the paper money, when they still had that. My mother kept some of it, pasted into her scrapbook along with the early photos. It was obsolete by then, you couldn't buy anything with it. Pieces of paper, thickish, greasy to the touch, green-coloured, with pictures on each side, some old man in a wig and on the other side a pyramid with an eye above it. It said *In God We Trust*. My mother said people used to have signs beside their cash registers, for a joke: *In God We Trust, All Others Pay Cash*. That would be blasphemy now.

You had to take those pieces of paper with you when you went shopping, though by the time I was nine or ten most people used plastic cards. Not for the groceries though, that came later. It seems so primitive, totemistic even, like cowrie shells. I must have used that kind of money myself, a little, before everything went on the Compubank.

I guess that's how they were able to do it, in the way they did, all at once, without anyone knowing beforehand. If there had still been portable money, it would have been more difficult.

It was after the catastrophe, when they shot the president and machine-gunned the Congress and the army declared a state of emergency. They blamed it on the Islamic

fanatics, at the time.

Keep calm, they said on television. Everything is under control.

I was stunned. Everyone was, I know that. It was hard to believe. The entire government, gone like that. How did they get in, how did it happen?

That was when they suspended the Constitution. They said it would be temporary. There wasn't even any rioting in the streets. People stayed home at night, watching television, looking for some direction. There wasn't even an enemy you could put your finger on.

Look out, said Moira to me, over the phone. Here it comes.

Here what comes? I said.

You wait, she said. They've been building up to this. It's you and me up against the wall, baby. She was quoting an expression of my mother's, but she wasn't intending to be funny.

Things continued in that state of suspended animation for weeks, although some things did happen. Newspapers were censored and some were closed down, for security reasons they said. The roadblocks began to appear, and Identipasses. Everyone approved of that, since it was obvious you couldn't be too careful. They said that new elections would be held, but that it would take some time to prepare for them. The thing to do, they said, was to continue on as usual.

The Pornomarts were shut, though, and there were no longer any Feels on Wheels vans and Bun-Die Buggies circling the Square. But I wasn't sad to see them go. We all knew what a nuisance they'd been.

It's high time somebody did something, said the woman behind the counter, at the store where I usually bought my cigarettes. It was on the corner, a newsstand chain: papers, candy, cigarettes. The woman was older, with grey hair; my mother's generation.

Did they just close them, or what? I asked.

She shrugged. Who knows, who cares, she said. Maybe they just moved them off somewhere else. Trying to get rid of it altogether is like trying to stamp out mice, you know? She punched my Compunumber into the till, barely looking at it: I was a regular, by then. People were complaining, she said.

The next morning, on my way to the library for the day, I stopped by the same store for another pack, because I'd run out. I was smoking more those days, it was the tension, you could feel it, like a subterranean hum, although things seemed so quiet. I was drinking more coffee too, and having trouble sleeping. Everyone was a little jumpy. There was a lot more music on the radio than usual, and fewer words.

When I got to the corner store, the usual woman wasn't there.

Instead there was a man, a young man, he couldn't have been more than twenty.

She sick? I said as I handed him my card.

Who? he said, aggressively I thought.

The woman who's usually here, I said.

How would I know, he said. He was punching my number in, studying each number, punching with one finger. He obviously hadn't done it before. I drummed my fingers on the counter, impatient for a cigarette, wondering if anyone had ever told him something

could be done about those pimples on his neck. I remember quite clearly what he looked like: tall, slightly stooped, dark hair cut short, brown eyes that seemed to focus two inches behind the bridge of my nose, and that acne. I suppose I remember him so clearly because of what he said next.

Sorry, he said. This number's not valid.

That's ridiculous, I said. It must be, I've got thousands in my account. I just got the statement two days ago. Try it again.

It's not valid, he repeated obstinately. See that red light? Means it's not valid.

You must have made a mistake, I said. Try it again.

He shrugged and gave me a fed-up smile, but he did try the number again. This time I watched his fingers, on each number, and checked the numbers that came up in the window. It was my number all right, but there was the red light again.

See? he said again, still with that smile, as if he knew some private joke he wasn't going to tell me.

I'll phone them from the office, I said. The system had fouled up before, but a few phone calls usually straightened it out. Still, I was angry, as if I'd been unjustly accused of something I didn't even know about. As if I'd made the mistake myself.

You do that, he said indifferently. I left the cigarettes on the counter, since I hadn't paid for them. I figured I could borrow some at work.

I did phone from the office, but all I got was a recording. The lines were overloaded, the recording said. Could I please phone back?

The lines stayed overloaded all morning, as far as I could tell. I phoned back several times, but no luck. Even that wasn't too unusual.

About two o'clock, after lunch, the director came in to the discing room.

I have something to tell you, he said. He looked terrible; his hair was untidy, his eyes were pink and wobbling, as though he'd been drinking.

We all looked up, turned off our machines. There must have been eight or ten of us in the room.

I'm sorry, he said, but it's the law. I really am sorry.

For what? somebody said.

I have to let you go, he said. It's the law, I have to. I have to let you all go. He said this almost gently, as if we were wild animals, frogs he'd caught, in a jar, as if he were being humane.

We're being fired? I said. I stood up. But why?

Not fired, he said. Let go. You can't work here anymore, it's the law. He ran his hands through his hair and I thought, He's gone crazy. The strain has been too much for him and he's blown his wiring.

You can't just do that, said the woman who sat next to me. This sounded false, improbable, like something you would say on television.

It isn't me, he said. You don't understand. Please go, now. His voice was rising. I don't want any trouble. If there's trouble the books might be lost, things will get broken. He looked over his shoulder. They're outside, he said, in my office. If you don't go now they'll come in themselves. They gave me ten minutes. By now he sounded crazier than ever.

He's loopy, someone said out loud; which we must all have thought.

But I could see out into the corridor, and there were two men standing there, in uniforms, with machine guns. This was too theatrical to be true, yet there they were: sudden apparitions, like Martians. There was a dreamlike quality to them; they were too vivid, too at odds with their surroundings.

Just leave the machines, he said while we were getting our things together, filing out. As if we could have taken them.

We stood in a cluster, on the steps outside the library. We didn't know what to say to one another. Since none of us understood what had happened, there was nothing much we could say. We looked at one another's faces and saw dismay, and a certain shame, as if we'd been caught doing something we shouldn't.

It's outrageous, one woman said, but without belief. What was it about this that made us feel we deserved it?

I've been fired, I told Moira when I got her on the phone. She said she would come over. By that time she was working for a women's collective, the publishing division. They put out books on birth control and rape and things like that, though there wasn't as much demand for those things as there used to be.

I'll come over, she said. She must have been able to tell from my voice that this was what I wanted.

She got there after some time. So, she said. She threw off her jacket, sprawled into the oversize chair. Tell me. First we'll have a drink.

She got up and went to the kitchen and poured us a couple of Scotches, and came back and sat down and I tried to tell her what had happened to me. When I'd finished, she said, Tried getting anything on your Compucard today?

Yes, I said. I told her about that too.

They've frozen them, she said. Mine too. The collective's too. Any account with an F on it instead of an M. All they needed to do is push a few buttons. We're cut off.

But I've got over two thousand dollars in the bank, I said, as if my own account was the only one that mattered.

Women can't hold property anymore, she said. It's a new law. Turned on the TV today?

No, I said.

It's on there, she said. All over the place. She was not stunned, the way I was. In some strange way she was gleeful, as if this was what she'd been expecting for some time and now she'd been proven right. She even looked more energetic, more determined. Luke can use your Compucount for you, she said. They'll transfer your number to him, or that's what they say. Husband or male next of kin.

But what about you? I said. She didn't have anyone.

I'll go underground, she said. Some of the gays can take over our numbers and buy us things we need.

But why? I said. Why did they?

Ours is not to reason why, said Moira. They had to do it that way, the Compucounts and the jobs both at once. Can you picture the airports, otherwise? They don't want us going anywhere, you can bet on that.

The Handmaid's Tale (Atwood, 1985)**Gender-irrelevant condition (Study 3 and 5)**

I walk with Ofglen along the summer street. It's warm, humid; this would have been sundress-and-sandals weather, once. In each of our baskets are strawberries - the strawberries are in season now, so we'll eat them and eat them until we're sick of them - and some wrapped fish. We got the fish at Loaves and Fishes, with its wooden sign, a fish with a smile and eyelashes. It doesn't sell loaves though. Most households bake their own, though you can get dried-up rolls and wizened doughnuts at Daily Bread, if you run short. Loaves and Fishes is hardly ever open. Why bother opening when there's nothing to sell? The sea fisheries were defunct several years ago; the few fish they have now are from fish farms, and taste muddy. The news says the coastal areas are being "rested." Sole, I remember, and haddock, swordfish, scallops, tuna; lobsters, stuffed and baked, salmon, pink and fat, grilled in steaks. Could they all be extinct, like the whales? I've heard that rumour, passed on to me in soundless words, the lips hardly moving, as we stood in line outside, waiting for the store to open, lured by the picture of succulent white fillets in the window. They put the picture in the window when they have something, take it away when they don't. Sign language.

Ofglen and I walk slowly today; we are hot in our long dresses, wet under the arms, tired. At least in this heat we don't wear gloves. There used to be an ice cream store, somewhere in this block. I can't remember the name. Things can change so quickly, buildings can be torn down or turned into something else, it's hard to keep them straight in your mind the way they used to be. You could get double scoops, and if you wanted they would put chocolate sprinkles on the top. These had the name of a man. Johnnies? Jackies? I can't remember.

Jimmys, that was the name.

Ofglen and I are more comfortable with one another now, we're used to each other. Siamese twins. We don't bother much with the formalities anymore when we greet each other; we smile and move off, in tandem, traveling smoothly along our daily track. Now and again we vary the route; there's nothing against it, as long as we stay within the barriers. A rat in a maze is free to go anywhere, as long as it stays inside the maze.

We've been to the stores already, and the church; now we're at the Wall. Nothing on it today, they don't leave the bodies hanging as long in summer as they do in winter, because of the flies and the smell. This was once the land of air sprays, pine and floral, and people retain the taste; especially the Commanders, who preach purity in all things.

"You have everything on your list?" Ofglen says to me now, though she knows I do. Our lists are never long. She's given up some of her passivity lately, some of her melancholy. Often she speaks to me first.

"Yes," I say.

"Let's go around," she says. She means down, towards the river. We haven't been that way for a while.

"Fine," I say. I don't turn at once, though, but remain standing where I am, taking a last look at the Wall. There are the red bricks, there are the searchlights, there's the barbed

wire, there are the hooks. Somehow the Wall is even more foreboding when it's empty like this. When there's someone hanging on it at least you know the worst. But vacant, it is also potential, like a storm approaching. When I can see the bodies, the actual bodies, when I can guess from the sizes and shapes that none of them is Luke, I can believe also that he is still alive.

I don't know why I expect him to appear on this wall. There are hundreds of other places they could have killed him. But I can't shake the idea that he's in there, at this moment, behind the blank red bricks.

I try to imagine which building he's in. I can remember where the buildings are, inside the Wall; we used to be able to walk freely there, when it was a university. We still go in there once in a while, for Women's Salvagings. Most of the buildings are red brick too; some have arched doorways, a Romanesque effect, from the nineteenth century. We aren't allowed inside the buildings anymore; but who would want to go in? Those buildings belong to the Eyes.

Maybe he's in the Library. Somewhere in the vaults. The stacks.

The Library is like a temple. There's a long flight of white steps, leading to the rank of doors. Then, inside, another white staircase going up. To either side of it, on the wall, there are angels. Also there are men fighting, or about to fight, looking clean and noble, not dirty and blood-stained and smelly the way they must have looked. Victory is on one side of the inner doorway, leading them on, and Death is on the other. It's a mural in honour of some war or other. The men on the side of Death are still alive. They're going to heaven. Death is a beautiful woman, with wings and one breast almost bare; or is that Victory? I can't remember.

They won't have destroyed that.

We turn our backs to the Wall, head left. Here there are several empty storefronts, their glass windows scrawled with soap. I try to remember what was sold in them, once. Cosmetics? Jewellery? It's just the ones dealing in what they call vanities that have been shut down.

At the corner is the store known as Soul Scrolls. It's a franchise: there are Soul Scrolls in every city centre, in every suburb, or so they say. It must make a lot of profit.

The window of Soul Scrolls is shatterproof. Behind it are print-out machines, row on row of them; these machines are known as Holy Rollers, but only among us, it's a disrespectful nickname. What the machines print is prayers, roll upon roll, prayers going out endlessly. They're ordered by Compuphone, I've overheard the Commander's Wife doing it. Ordering prayers from Soul Scrolls is supposed to be a sign of piety and faithfulness to the regime, so of course the Commanders' Wives do it a lot. It helps their husbands' careers.

There are five different prayers: for health, wealth, a death, a birth, a sin. You pick the one you want, punch in the number, then punch in your own number so your account will be debited, and punch in the number of times you want the prayer repeated.

The machines talk as they print out the prayers; if you like, you can go inside and listen to them, the toneless metallic voices repeating the same thing over and over. Once the prayers have been printed out and said, the paper rolls back through another slot and

is recycled into fresh paper again. There are no people inside the building: the machines run by themselves. You can't hear the voices from outside; only a murmur, a hum, like a devout crowd, on its knees. Each machine has an eye painted in gold on the side, flanked by two small golden wings.

I try to remember what this place sold when it was a store, before it was turned into Soul Scrolls. I think it was lingerie. Pink and silver boxes, coloured pantyhose, brassieres with lace, silk scarves? Something lost.

Ofglen and I stand outside Soul Scrolls, looking through the shatterproof windows, watching the prayers well out from the machines and disappear again through the slot, back to the realm of the unsaid. Now I shift my gaze. What I see is not the machines, but Ofglen, reflected in the glass of the window. She's looking straight at me.

We can see into each other's eyes. This is the first time I've ever seen Ofglen's eyes, directly, steadily, not aslant. Her face is oval, pink, plump but not fat, her eyes roundish.

She holds my stare in the glass, level, unwavering. Now it's hard to look away. There's a shock in this seeing; it's like seeing somebody naked, for the first time. There is risk, suddenly, in the air between us, where there was none before. Even this meeting of eyes holds danger. Though there's nobody near.

At last Ofglen speaks. "Do you think God listens," she says, "to these machines?" She is whispering: our habit at the Centre.

In the past this would have been a trivial enough remark, a kind of scholarly speculation. Right now it's treason.

I could scream. I could run away. I could turn from her silently, to show her I won't tolerate this kind of talk in my presence. Subversion, sedition, blasphemy, heresy, all rolled into one.

I steel myself. "No," I say.

She lets out her breath, in a long sigh of relief. We have crossed the invisible line together. "Neither do I," she says.

"Though I suppose it's faith, of a kind," I say. "Like Tibetan prayer wheels."

"What are those?" she asks.

"I only read about them," I say. "They are moved around by the wind. They're all gone now."

"Like everything," she says. Only now do we stop looking at one another.

"Is it safe here?" I whisper.

"I figure it's the safest place," she says. "We look like we're praying, is all."

"What about them?"

"Them?" she says, still whispering. "You're always safest out of doors, no mike, and why would they put one here? They'd think nobody would dare. But we've stayed long enough. There's no sense in being late getting back." We turn away together. "Keep your head down as we walk," she says, "and lean just a little towards me. That way I can hear you better. Don't talk when there's anyone coming."

We walk, heads bent as usual. I'm so excited I can hardly breathe, but I keep a steady pace. Now more than ever I must avoid drawing attention to myself.

"I thought you were a true believer," Ofglen says.

"I thought you were," I say.

“You were always so stinking pious.”

“So were you,” I reply. I want to laugh, shout, hug her.

“You can join us,” she says.

“Us?” I say. There is an us then, there’s a we. I knew it.

“You didn’t think I was the only one,” she says.

I didn’t think that. It occurs to me that she may be a spy, a plant, set to trap me; such is the soil in which we grow. But I can’t believe it; hope is rising in me, like sap in a tree. Blood in a wound. We have made an opening.

I want to ask her if she’s seen Moira, if anyone can find out what’s happened, to Luke, to my child, my mother even, but there’s not much time; too soon we’re approaching the corner of the main street, the one before the first barrier. There will be too many people.

“Don’t say a word,” Ofglen warns me, though she doesn’t need to. “In any way.”

“Of course I won’t,” I say. Who could I tell?

We walk the main street in silence, past Lilies, past All Flesh. There are more people on the sidewalks this afternoon than usual: the warm weather must have brought them out. Women, in green, blue, red, stripes; men too, some in uniform, some only in civilian suits. The sun is free, it is still there to be enjoyed. Though no one bathes in it anymore, not in public.

There are more cars too, Whirlwinds with their chauffeurs and their cushioned occupants, lesser cars driven by lesser men.

Something is happening: there’s a commotion, a flurry among the shoals of cars. Some are pulling over to the side, as if to get out of the way. I look up quickly: it’s a black van, with the white-winged eye on the side. It doesn’t have the siren on, but the other cars avoid it anyway. It cruises slowly along the street, as if looking for something: shark on the prowl.

I freeze, cold travels through me, down to my feet. There must have been microphones, they’ve heard us after all.

Ofglen, under cover of her sleeve, grips my elbow. “Keep moving,” she whispers. “Pretend not to see.”

But I can’t help seeing. Right in front of us the van pulls up. Two Eyes, in grey suits, leap from the opening double doors at the back. They grab a man who is walking along, a man with a briefcase, an ordinary-looking man, slam him back against the black side of the van. He’s there a moment, splayed out against the metal as if stuck to it; then one of the Eyes moves in on him, does something sharp and brutal that doubles him over, into a limp cloth bundle. They pick him up and heave him into the back of the van like a sack of mail. Then they are inside also and the doors are closed and the van moves on.

It’s over, in seconds, and the traffic on the street resumes as if nothing has happened.

What I feel is relief. It wasn’t me.

Two Were Left (Cave, 1942)**Boy version (Study 2 and 6)**

On the third night of hunger, Noni thought of the dog. Nothing else lived on the ice island.

In the breakup of the iceberg, Noni lost everything. He had only Nimuk, his devoted, loyal husky. And now the two were alone. They were stranded on the ice. They eyed each other.

Noni's love for Nimuk was very real. But Noni knew that the men of his village killed their dogs. They did it when there was no food. They did not think twice about it.

And he knew that Nimuk was hungry, too. "One of us will soon be eating the other," Noni thought. "So . . ."

He could not kill the dog with his bare hands. Nimuk was powerful. A weapon, like a knife, was needed.

Removing his mittens, he unstrapped the brace from his leg. He had hurt his leg a few weeks ago. He had made the brace from pieces of leather and iron.

He put one of the pieces into a crack in the ice. Then he began to rub the other against it. Nimuk watched him.

He worked all night. At dawn, his task was complete.

Noni pulled the finished knife from the ice. He touched its edge. The sun reflected from it.

"Here, Nimuk," he called softly. The dog watched him suspiciously. "Come here," Noni called.

Nimuk came closer. Noni saw fear in the animal's eyes. Weakened by hunger, the dog dragged his body forward. Noni's heart wept. Now! Now was the time to strike!

A terrible feeling came over Noni, and he started to cry. He could not hurt Nimuk. He cursed the knife and threw it far from him. He fell.

Now the dog growled. He circled the boy's body. Noni was sick with fear. Without the knife, he was defenseless. He was too weak to go get it now. And Nimuk was hungry.

The dog circled him. Noni heard his breathing from behind and knew Nimuk was getting close. He prayed for the attack to be fast. He felt the dog's breath against his neck. He knew this was the end.

Then he felt the dog's hot tongue. Nimuk was licking his face.

Noni's eyes opened. He did not believe it. He pulled the dog into his arms. Then he began to cry.

The plane came out of the south. The pilot looked down. He saw something flashing. He turned his plane. He saw a shape. It looked human. Or were there two shapes?

He set his plane down and went to them. They were a boy and a dog. The boy was unconscious. But he was alive. The dog whined. He was too weak to move.

A short distance away there was a shiny object. It was what caught the pilot's attention. It was a knife stuck in the ice. It moved gently in the wind.

A Brief History of Musical Firsts (Rosen, 2016)

Non-fiction condition (Study 2 and 5)

Astronaut Chris Hadfield has a new song out, a sweet Christmas melody laid over some solid guitar strumming. But if you listen carefully, you'll hear something else: a soft whir of fans in the background. Why? Because this song wasn't recorded in the constructed silence of a recording studio, but on the International Space Station as it orbited Earth at about 17,000 miles per hour, some 260 miles overhead.

It seems that this is the first song written specifically for the International Space Station to be recorded there. But that's a pretty specific accomplishment – and that's because humans have been playing music in space for about five decades. The first song we have a recording of from space was also a Christmas tune, this one a bit better known: Jingle Bells. Astronauts Walter M. Schirra Jr. and Thomas P. Stafford snuck some bells and a harmonica (now housed at the Smithsonian's Air and Space Museum) onto Gemini 6 in 1965. As they prepared to re-enter Earth's atmosphere on December 16, they played a little joke on those listening down below.

The prank, captured in the video below, is a little hard to make out verbatim, but Schirra's later recollections give the joke's flavor. He wrote: "We have an object, looks like a satellite going from north to south, probably in polar orbit.... Looks like he might be going to re-enter soon.... You just might let me pick up that thing.... I see a command module and eight smaller modules in front. The pilot of the command module is wearing a red suit." And then they began to play.

Stafford told Smithsonian Magazine in 2005 that it was Schirra who originally came up with the idea. "He could play the harmonica, and we practiced two or three times before we took off, but of course we didn't tell the guys on the ground.... We never considered singing, since I couldn't carry a tune in a bushelbasket."

It seems that no one heard the recording of that moment – the first musical instruments played in space, according to Margaret A. Weitekamp, a curator at the Air and Space Museum – for decades, but last year a YouTube user by the name buzzlab, and identified by Boing Boing as "Patrick," ferreted it out of NASA's Media Resource Center in Houston, Texas, which provided him with 33 hours of audio files from the mission with a note that promised, "It's in there somewhere."

On the International Space Station and Mir, where astronauts have lived for long periods and therefore have had more leisure time, instruments have been fixtures of space-station living – wherever humans live, music lives too. On a space station, NASA explains, the instruments don't sound any different, but they are all thoroughly checked to make sure they will not threaten the safety of the astronauts (if they were to, say, emit some noxious gases, or perhaps combust). Astronauts have to adapt to playing without gravity, figuring out clever ways of holding themselves in place while they strum or tap the keys.

Over the years of space-station living, there have been many firsts: Cosmonaut Yuri Romanenko wrote 20 songs while living on Mir in the late '80s, though it seems he did not record them there. Hadfield brought a modified, foldable electric guitar to Mir in the

'90s, and he and astro-guitarist Thomas Reiter used it to play Russian folk ballads and Beatles songs. Several astronauts have schlepped keyboards with them; Don Petit turned a vacuum tube into a workable didgeridoo; and two astronauts, Cady Coleman and Ellen Ochoa, have both brought flutes with them into space. In 2011, a recording of Coleman playing Bach's Bouree was merged with another from Ian Anderson, of Jethro Tull, for the first ever Earth-space duet.

But there is one first that was planned and never happened, and that story is a reminder of the tough path that space exploration has sometimes been. And that is the story of Ron McNair, who was the first person to bring an instrument into space (not counting the bells and harmonica of the Gemini pranksters). In 1984 he brought his saxophone with him on a shuttle mission. The tape of that music was sadly recorded over.

Following that trip, composer Jean Michel Jarre wrote a piece for McNair to debut on his next flight – the 1986 *Challenger* mission. It would have been the first piece ever composed for and debuted in space, and McNair's solo would have been fed to an Earth concert over a live feed.

After the loss of the *Challenger's* crew, saxophonist Kirk Whalun recorded the work, renamed Ron's Piece.

Appendix H: Transportation Scale (Green & Brock, 2000)

Circle the number under each question that best represents your opinion about the narrative you just read.

1	2	3	4	5	6	7
Not at All						Very Much

1. While I was reading the narrative, I could easily picture the events in it taking place.
2. While I was reading the narrative, activity going on in the room around me was on my mind.
3. I could picture myself in the scene of the events described in the narrative.
4. I was mentally involved in the narrative while reading it.
5. After the narrative ended, I found it easy to put it out of my mind.
6. I wanted to learn how the narrative ended.
7. The narrative affected me emotionally.
8. I found myself thinking of ways the narrative could have turned out differently.
9. I found my mind wandering while reading the narrative.
10. The events in the narrative are relevant to my everyday life.
11. The events in the narrative have changed my life.
12. I had a vivid mental image of [character name].

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.

Appendix I: Study 2 Additional Measures

Pick the main event or theme that is most relevant to the story you just read:

1. The history of playing music in space (*Musical Firsts*, correct)
2. An astronaut, turn singer, reflects on the passage of time since his mission to the moon (*Musical Firsts*, incorrect)
3. The restrictions of a woman's right to work and own property under militant, patriarchal government (*The Handmaid's Tale*, correct)
4. A woman reflects on her life before she stopped working in order to have a family (*The Handmaid's Tale*, incorrect)
5. Loyalty and friendship is more important than anything, even in the face of death (*Two Were Left*, correct)
6. A boy kills his dog in order to survive when he is stranded on an ice island (*Two Were Left*, incorrect)
7. None of these options

Appendix J: Study 4 Reading

Race Condition

I use to work transferring books to computer discs, to cut down on storage space and replacement costs, they said. Discers, we called ourselves. We called the library a dis-cotheque, which was a joke of ours. After the books were transferred they were supposed to go to the shredder, but sometimes I took them home with me. I liked the feel of them, and the look.

It's strange, now, to think about having a job. Job. It's a funny word.

Do a jobbie, they'd say to children when they were being toilet trained. Or of dogs: he did a job on the carpet. You were supposed to hit them with rolled-up newspapers, my father said. I can remember when there were newspapers, though I never had a dog, only cats.

All those Asian-Americans having jobs: hard to imagine, now, but thousands of them had jobs, millions. It was considered the normal thing. Now it's like remembering the paper money, when they still had that. My father kept some of it, pasted into his scrapbook along with the early photos. It was obsolete by then, you couldn't buy anything with it. Pieces of paper, thickish, greasy to the touch, green-coloured, with pictures on each side, some old man in a wig and on the other side a pyramid with an eye above it. It said *In God We Trust*. My father said people used to have signs beside their cash registers, for a joke: *In God We Trust, All Others Pay Cash*. That would be blasphemy now.

You had to take those pieces of paper with you when you went shopping, though by the time I was nine or ten most people used plastic cards. Not for the groceries though, that came later. It seems so primitive, totemistic even, like cowrie shells. I must have used that kind of money myself, a little, before everything went on the Compubank.

I guess that's how they were able to do it, in the way they did, all at once, without anyone knowing beforehand. If there had still been portable money, it would have been more difficult.

It was after the catastrophe, when they shot the president and machine-gunned the Congress and the army declared a state of emergency. They blamed it on fanatics, at the time.

Keep calm, they said on television. Everything is under control.

I was stunned. Everyone was, I know that. It was hard to believe. The entire government, gone like that. How did they get in, how did it happen?

That was when they suspended the Constitution. They said it would be temporary. There wasn't even any rioting in the streets. People stayed home at night, watching television, looking for some direction. There wasn't even an enemy you could put your finger on.

Look out, said Ming to me, over the phone. Here it comes.

Here what comes? I said.

You wait, he said. They've been building up to this. It's you and me up against the wall, baby. He was quoting an expression of my father's, but he wasn't intending to be funny.

Things continued in that state of suspended animation for weeks, although some things did happen. Newspapers were censored and some were closed down, for security reasons they said. The roadblocks began to appear, and Identipasses. Everyone approved of that,

since it was obvious you couldn't be too careful. They said that new elections would be held, but that it would take some time to prepare for them. The thing to do, they said, was to continue on as usual.

The Pornomarts were shut, though, and there were no longer any Feels on Wheels vans and Bun-Die Buggies circling the Square. But I wasn't sad to see them go. We all knew what a nuisance they'd been.

It's high time somebody did something, said the man behind the counter, at the store where I usually bought my cigarettes. It was on the corner, a newsstand chain: papers, candy, cigarettes. The man was older, with grey hair; my father's generation.

Did they just close them, or what? I asked.

He shrugged. Who knows, who cares, he said. Maybe they just moved them off somewhere else. Trying to get rid of it altogether is like trying to stamp out mice, you know? He punched my Compunumber into the till, barely looking at it: I was a regular, by then. People were complaining, he said.

The next morning, on my way to the library for the day, I stopped by the same store for another pack, because I'd run out. I was smoking more those days, it was the tension, you could feel it, like a subterranean hum, although things seemed so quiet. I was drinking more coffee too, and having trouble sleeping. Everyone was a little jumpy. There was a lot more music on the radio than usual, and fewer words.

When I got to the corner store, the usual man wasn't there. Instead there was a young man, he couldn't have been more than twenty.

He sick? I said as I handed him my card.

Who? he said, aggressively I thought.

The man who's usually here, I said.

How would I know, he said. He was punching my number in, studying each number, punching with one finger. He obviously hadn't done it before. I drummed my fingers on the counter, impatient for a cigarette, wondering if anyone had ever told him something could be done about those pimples on his neck. I remember quite clearly what he looked like: tall, slightly stooped, light hair cut short, blue eyes that seemed to focus two inches behind the bridge of my nose, and that acne. I suppose I remember him so clearly because of what he said next.

Sorry, he said. This number's not valid.

That's ridiculous, I said. It must be, I've got thousands in my account. I just got the statement two days ago. Try it again.

It's not valid, he repeated obstinately. See that red light? Means it's not valid.

You must have made a mistake, I said. Try it again.

He shrugged and gave me a fed-up smile, but he did try the number again. This time I watched his fingers, on each number, and checked the numbers that came up in the window. It was my number all right, but there was the red light again.

See? he said again, still with that smile, as if he knew some private joke he wasn't going to tell me.

I'll phone them from the office, I said. The system had fouled up before, but a few phone calls usually straightened it out. Still, I was angry, as if I'd been unjustly accused of something I didn't even know about. As if I'd made the mistake myself.

You do that, he said indifferently. I left the cigarettes on the counter, since I hadn't paid for them. I figured I could borrow some at work.

I did phone from the office, but all I got was a recording. The lines were overloaded, the recording said. Could I please phone back?

The lines stayed overloaded all morning, as far as I could tell. I phoned back several times, but no luck. Even that wasn't too unusual.

About two o'clock, after lunch, the director came in to the discing room.

I have something to tell you, he said. He looked terrible; his hair was untidy, his eyes were pink and wobbling, as though he'd been drinking.

We all looked up, turned off our machines. There must have been eight or ten of us in the room.

I'm sorry, he said, but it's the law. I really am sorry.

For what? somebody said.

I have to let you go, he said. It's the law, I have to. I have to let you all go. He said this almost gently, as if we were wild animals, frogs he'd caught, in a jar, as if he were being humane.

We're being fired? I said. I stood up. But why?

Not fired, he said. Let go. You can't work here anymore, it's the law. He ran his hands through his hair and I thought, He's gone crazy. The strain has been too much for him and he's blown his wiring.

You can't just do that, said the man who sat next to me. This sounded false, improbable, like something you would say on television.

It isn't me, he said. You don't understand. Please go, now. His voice was rising. I don't want any trouble. If there's trouble the books might be lost, things will get broken. He looked over his shoulder. They're outside, he said, in my office. If you don't go now they'll come in themselves. They gave me ten minutes. By now he sounded crazier than ever.

He's loopy, someone said out loud; which we must all have thought.

But I could see out into the corridor, and there were two men standing there, in uniforms, with machine guns. This was too theatrical to be true, yet there they were: sudden apparitions, like Martians. There was a dreamlike quality to them; they were too vivid, too at odds with their surroundings.

Just leave the machines, he said while we were getting our things together, filing out. As if we could have taken them.

We stood in a cluster, on the steps outside the library. We didn't know what to say to one another. Since none of us understood what had happened, there was nothing much we could say. We looked at one another's faces and saw dismay, and a certain shame, as if we'd been caught doing something we shouldn't.

It's outrageous, one man said, but without belief. What was it about this that made us feel we deserved it?

I've been fired, I told Ming when I got him on the phone. I'll come over, he said. He must have been able to tell from my voice that this was what I wanted.

He got there after some time. So, he said. He threw off his jacket, sprawled into the

oversize chair. Tell me. First we'll have a drink.

He got up and went to the kitchen and poured us a couple of Scotches, and came back and sat down and I tried to tell him what had happened to me. When I'd finished, he said, Tried getting anything on your Compucard today?

Yes, I said. I told him about that too.

They've frozen them, he said. Mine too. The collective's too. Any account with an A on it. All they needed to do is push a few buttons. We're cut off. But I've got over two thousand dollars in the bank, I said, as if my own account was the only one that mattered.

Asians can't hold property anymore, he said. It's a new law. Turned on the TV today?

No, I said.

It's on there, he said. All over the place. He was not stunned, the way I was. In some strange way he was gleeful, as if this was what he'd been expecting for some time and now he'd been proven right. He even looked more energetic, more determined.

But why? I said. Why did they?

Ours is not to reason why, said Ming. They had to do it that way, the Compucounts and the jobs both at once. Can you picture the airports, otherwise? They don't want us going anywhere, you can bet on that.

Appendix K: Scale of Anti-Asian American Stereotypes (Lin et al., 2005)

Below are a number of statements with which you will agree or disagree. There are absolutely no right or wrong answers. Use the specified scale to indicate the number that best matches your response to each statement.

1	2	3	4	5	6
Strongly Disagree					Strongly Agree

1. Asian Americans seem to be striving to become number one.
2. Asian Americans commit less time to socializing than others do.
3. In order to get ahead of others, Asian Americans can be overly competitive.
4. Asian Americans do not usually like to be the centre of attention at social gatherings.
5. Most Asian Americans have a mentality that stresses gain of economic power.
6. Asian Americans can sometimes be regarded as acting too smart.
7. Asian Americans put high priority on their social lives.
8. Asian Americans do not interact with others smoothly in social situations.
9. As a group, Asian Americans are not constantly in pursuit of more power.
10. When it comes to education, Asian Americans aim to achieve too much.
11. Asian Americans tend to have less fun compared to other social groups.
12. A lot of Asian Americans can be described as working all the time.
13. The majority of Asian Americans tend to be shy and quiet.

14. Asian Americans are not very “street smart”.
15. Asian Americans know how to have fun and can be pretty relaxed.
16. Most Asian Americans are not very vocal.
17. Asian Americans are a group not obsessed with competition.
18. Asian Americans spend a lot of time at social gatherings.
19. Oftentimes, Asian Americans think they are smarter than everyone else is.
20. Asian Americans enjoy a disproportionate amount of economic success.
21. Asian Americans are not as social as other groups of people.
22. Asian Americans are motivated to obtain too much power in society.
23. Most Asian Americans function well in social situations.
24. Many Asian Americans always seem to compare their own achievements to other people’s.
25. Asian Americans rarely initiate social events or gatherings.

Competence subscale = items 1, 3, 5, 6, 9, 10, 12, 17, 19, 20, 22, 24

Sociability subscale = items 2, 4, 7, 8, 11, 13, 14, 15, 16, 18, 21, 23, 25

Items 7, 9, 15, 17, 18, 23 are reverse scored.

Appendix L: Lemon Task (Holmes & Matthews, 2005)

Now you are going to go through an exercise that involves imagining a lemon

You are going to be asked to imagine different aspects of the lemon. As you go along pay attention to what you can picture in your imagination. As you go through this task you will be asked: How vividly could you imagine the situation that was described? After reading each of the instructions you should shut your eyes, as this will help you imagine the situation more vividly. You do not need to spend a lot of time on each instruction. Imagine yourself being actively involved and taking part in the situation, seeing it through your own eyes. (items answered by selecting point on a 5-point scale):

1	2	3	4	5
Not at all vivid	Slightly vivid	Somewhat vivid	Very vivid	Extremely vivid

- Imagine holding a lemon. *How vividly can you imagine this?*
- Now imagine you are shining a light on the lemon and look at its skin - what can you see? Imagine taking a flashlight with your other hand and shining it onto the lemon so you can see it more clearly. *How vividly could you imagine the situation that was described?*
- Now cut into it with knife and smell the juice. Scratch lemon's skin. Can you smell it – that zesty smell? Can you see the inside of the lemon? What does that look like? Now bring the lemon right up to your face and have a really close look at it. Can you imagine the smell? *How vividly could you imagine the situation that was described?*
- You suddenly squeeze the lemon, and it squirts into your eye. Do you feel pain? Irritation? Surprise? You splash cool water in your eyes, they feel better now. *How vividly could you imagine the situation that was described?*

Appendix M: Fourth-Grade Task

Instructions:

This is a study about reading. Today, we are asking you to read a narrative and evaluate it for use by adults who read at the fourth-grade level. Many adults in adult literacy programs are only able to reach this level. Interesting stories at the fourth-grade level are therefore needed for these adults. For the fourth-grade reader, it is important to avoid long words (too many syllables), complex sentences (too many clauses), and difficult expressions (familiar words in hard-to-understand combinations).

Appendix N: Study 6 Stimuli

Character image (Girl version)



On the third night of hunger, Noni thought of the dog. Nothing else lived on the ice island.

In the breakup of the iceberg, Noni lost everything. She had only Nimuk, her devoted, loyal husky. And now the two were alone. They were stranded on the ice. They eyed each other.

Noni's love for Nimuk was very real. But Noni knew that the men of her village killed their dogs. They did it when there was no food. They did not think twice about it.

And she knew that Nimuk was hungry, too. "One of us will soon be eating the other," Noni thought. "So . . ."

She could not kill the dog with her bare hands. Nimuk was powerful. A weapon, like a knife, was needed.

Removing her mittens, she unstrapped the brace from her leg. She had hurt her leg a few weeks ago. She had made the brace from pieces of leather and iron.

She put one of the pieces into a crack in the ice. Then she began to rub the other against it. Nimuk watched her.

She worked all night. At dawn, her task was complete.

Noni pulled the finished knife from the ice. She touched its edge. The sun reflected from it.

"Here, Nimuk," she called softly. The dog watched her suspiciously. "Come here," Noni called.

Nimuk came closer. Noni saw fear in the animal's eyes. Weakened by hunger, the dog dragged his body forward. Noni's heart wept. Now! Now was the time to strike!

A terrible feeling came over Noni, and she started to cry. She could not hurt Nimuk. She cursed the knife and threw it far from her. She fell.

Now the dog growled. He circled the girl's body. Noni was sick with fear. Without the knife, she was defenceless. She was too weak to go get it now. And Nimuk was hungry.

The dog circled her. Noni heard his breathing from behind and knew Nimuk was getting close. She prayed for the attack to be fast. She felt the dog's breath against her neck. She knew this was the end.

Then she felt the dog's hot tongue. Nimuk was licking her face.

Noni's eyes opened. She did not believe it. She pulled the dog into her arms. Then she began to cry.

The plane came out of the south. The pilot looked down. He saw something flashing. He turned his plane. He saw a shape. It looked human. Or were there two shapes?

He set his plane down and went to them. They were a girl and a dog. The girl was unconscious. But she was alive. The dog whined. He was too weak to move.

A short distance away there was a shiny object. It was what caught the pilot's attention. It was a knife stuck in the ice. It moved gently in the wind.

No character image condition (Girl version)



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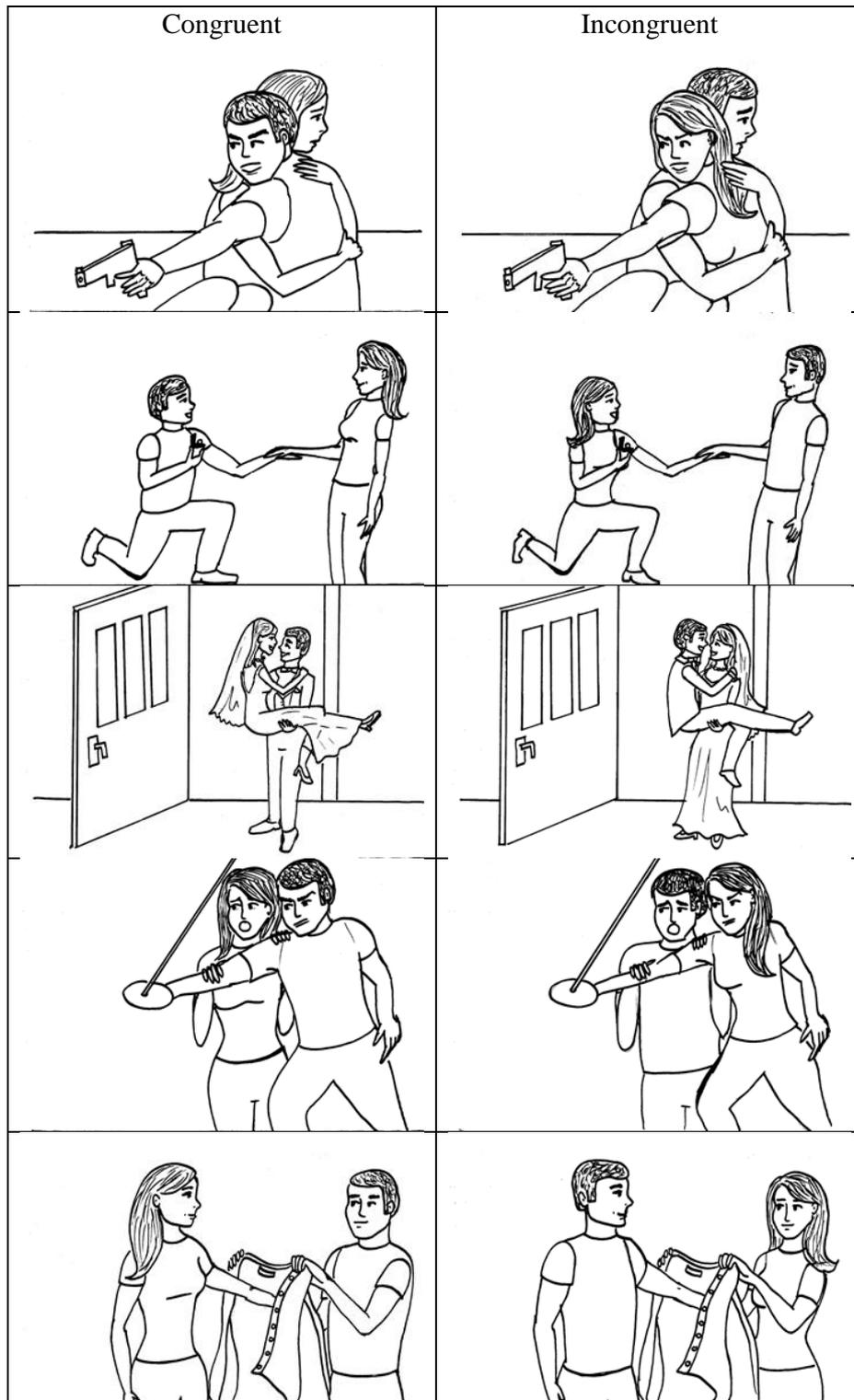
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Appendix O: Benevolent Sexism IAT Targets



Appendix P: Descriptive Statistics for HRV

Table P.1

Descriptive Statistics for Heart Rate Variability Measures for Each Condition

	Baseline		Reading		<i>p</i>
	Mean	SD	Mean	SD	
LF ms ²	68.93	13.63	66.53	13.40	.80
HF ms ²	30.99	13.59	33.57	13.36	.02
LF (no units)	530.81	390.01	509.54	469.83	.12
HF (no units)	194.90	77.24	214.67	87.74	.12

Note: HF = high frequency, LF = low frequency.