Fiction as Autobiography

Brenda W. Yang

Duke University

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“For surely it is a magical thing for a handful of words, artfully arranged, to stop time. To conjure a place, a person, a situation, in all its specificity and dimensions. To affect us and alter us, as profoundly as real people and things do.” – Jhumpa Lahiri

*“Memory... is a shifting, partial thing, a net that doesn't catch all the fish by any means and sometimes catches butterflies that don't exist.” – Rebecca Solnit, in *The Faraway Nearby**

Introduction

The aim of this document is to discuss a category of experience that consumes vast acres of the psychological landscape: the consumption of *narrative fiction*, broadly including novels, short stories, films, and television shows. I point to what parts of this phenomenon have been explored, and what remains uncharted. And as with any good adventure, I aim to return with a new understanding of the world at large.

As an illustrative example, consider the Jorge Borges short story “Funes el Memorioso” (Funes the Memorious), which describes the eponymous main character who can remember all things perfectly: “He knew the forms of the clouds in the southern sky on the morning of April 30, 1882, and he could compare them in his memory with the veins in the marbled binding of a book he had seen only once” (Borges, 2006). The narrator is racing a storm on horseback with his cousin when he first sees Ireneo Funes, who made an impression on the narrator by giving the time without a reference:

“After a sultry day, an enormous slate-gray storm had obscured the sky... We rode into a narrow lane which wound down between two enormously high brick footpaths. It had grown black of a sudden... I raised my eyes and saw a boy running along the narrow, cracked path... I remember the loose trousers, tight at the bottom, the hemp sandals; I remember the cigarette in the hard visage, standing out against the by now limitless darkness. Bernardo unexpectedly yelled to him: ‘What’s the time, Ireneo?’ Without looking up, without stopping, Ireneo replied, ‘In ten minutes it will be eight o’clock, child Bernardo Juan Francisco.’ The voice was sharp, mocking.” (p. 108).

As the story proceeds, this trick of memory is revealed to be more of a curse than a gift: Funes cannot understand abstraction. For example, while he could recall an entire day of his life precisely, this process of remembering would take another whole day.

This short story is a favorite among cognitive scientists. It is cited in articles and books communicating scientific concepts (Lombrozo, 2015; Quiroga, 2012) as well as high-impact publications, including *Science* and *Nature Neuroscience* (Chen et al., 2017; Izquierdo & Cammarota, 2004). “Funes el Memorioso,” like other works of fiction, can serve as entertainment and diversion. It can also do a great deal more: it is used to make a point about the function of forgetting, it is a simulation that offers an understanding of the nature of memory, and it engages the reader differently than an expository argument with similar content. Like virtually all stories, it utilizes characters, briefly sketched here but vividly realized (“the cigarette in the hard visage”), moving through spatial contexts. And source confusion is unlikely here: the story is difficult to mistake for reality. The process of understanding, remembering, and discussing this scene and story is the behavior I will examine here.

Motivation & Consequences of Fiction

Why study fiction? For one, it is a pervasive human activity. Narrative media is a large part of people’s day to day lives: 74% Americans have read a book in the past year (Perrin, 2018), 71% watch a movie once a week or more (Taylor, Funk, & Craighill, 2006), and in 2015, Netflix users accumulated 42.5 billion hours of total viewing time (Luckerson, 2016). Works of fiction make headlines and create cultural moments, from grand film releases such as *Star Wars: The Last Jedi* and *Black Panther* (Barnes, 2017; Cobb, 2018; Wallace, 2018) to short stories, e.g. the recently published *Cat Person* (Roupenian, 2017; Sini, 2017). Universities devote buildings and departments to the scholarly analysis of literature, movies, television shows, and other forms of narrative art. Thus, studying engagement with fiction is of inherent interest and importance to psychology, a science concerned with describing and understanding all aspects of human behavior. Secondly, fiction is of

particular relevance to memory researchers, as it is clear that people recollect works of fiction day to day, whether in conversation with others or in written form, in blogs and even scholarly works. Any theory of memory which does not allow or account for how and why people remember fictional events fails to capture key aspects of remembering.

And thirdly, reading fiction has downstream effects on learning, attitudes, and behavior in the real world. In other words, reading and watching fiction *matters*, and a full description of how people read and remember fiction can contribute to understanding why. While a thorough review of the many ways fiction impacts people's lives is beyond the scope of the present project, I present a survey here to give a flavor of this work, and to motivate the topic more generally.

People learn from fiction. While the people, places, and events in fiction are frequently—by definition—invented, there is great overlap between what is true of the world and what is true in a work of fiction. For example, while reading *Funes el Memorioso*, the reader assumes that horses have four legs and run quickly, that storms involve water falling from the sky, that most people have normal memories, and so on. This brings up an interesting theoretical issue: how do people decide what information in a story is true in general, and what information is true only in the fictional world? Information in the former category might be incorporated into general knowledge, while the latter should be held apart. In general, work has shown that information learned in a story is partly *incorporated* into the knowledge base and partly *compartmentalized* (e.g. Potts & Peterson, 1985). Overall, people's knowledge base and fiction have a dialogical relationship: people leverage what they know in order to make sense of stories, and they can also learn information about the world from fictional narratives (Marsh, Meade, & Roediger, 2003; Rapp, Hinze, Slaten, & Horton, 2014; Marsh & Mullet, 2016). Thus, educators in diverse disciplines have

incorporated works of fiction into curricula, such as utilizing the feature film GATTACA to help teach genetics (Knippels, Severiens, & Klop, 2009) or using fictionalized historical diaries to bring history “to life” (Storey, 1982).

However, there is a dark side to learning from fiction. For example, novels have been used to teach secondary students about the Holocaust, which vary in how well they serve this pedagogical role (Short, 1997). Some are commendable for their vivacity and accuracy in, for instance, describing the dire economic conditions in Germany preceding Hitler’s rise to power. Others cultivate misconceptions either directly (e.g. depicting Jewish people in Germany as a highly religious group overall) or by omission (e.g. avoiding mention of the existence of extermination camps). Experimental research also supports the notion that works of fiction can result in learning both true and false information. In a series of studies, when true (e.g. *Moscow is the capital of Russia*) and false (e.g. *the largest ocean is the Atlantic*) statements were embedded into short stories, readers reproduced these facts on later tests of general knowledge (Marsh, 2004; Marsh & Fazio, 2006, 2007). Notably, this was true of both types of statements, meaning that while readers were more likely to answer Moscow correctly after reading the correct version of the story, they were also more likely to reproduce the false fact about the Atlantic Ocean. Interestingly, people are quite susceptible to falsehoods in both text and film even they know the correct answer (Butler, Zaromb, Lyle, & Roediger, 2009; Marsh, Butler, & Umanath, 2012).

Media Can Shift How People View the World. In addition to learning from fiction, media can also influence people’s perspectives in subtle but significant ways. For example, people ranging from Michelle Obama to educators to popular psychology blogs have been quoted as saying “representation matters” (Hall, 2018; Jones, 2016; Thomas, 2016). This is the intuition that the people and situations seen in mass media shape how people view the

real world. This idea has been examined at length in the communication literature: *cultivation theory* posits that the many hours people spend in front of their television and other forms of mass media will “cultivate” a view of the world that is skewed towards what is depicted on-screen, and sometimes away from reality¹ (Morgan & Shanahan, 2010). This research finds that heavy viewers of television tend to have increased judgments about the prevalence of occupations such as doctors, lawyers, and scientists, as well as inflated estimates of divorce and murder rates (Gerbner, Gross, Morgan, & Signorielli, 1980; Shrum, Wyer, & O’Guinn, 1998). When people are made aware of their reliance on television as a source for such judgments, this difference between light and heavy viewers goes away, suggesting that people implicitly rely on the availability heuristic (Tversky & Kahneman, 1973). Recent work on this topic brings a more focused approach in examining the relationship between TV consumption and attitudes. One study finds a relationship between the number of the medical drama *Grey’s Anatomy* episodes seen and evaluations of doctor courageousness, as mediated by judgments of *Grey’s Anatomy*’s credibility; judgments of doctor courageousness were also related to patient’s satisfaction with their own physicians (Quick, 2009). Overall, cultivation effects appear to be small but consistent, with meta-analyses estimating an average effect size of 0.10 (Morgan & Shanahan, 1997; Shanahan & Morgan, 1999, p. Ch. 6).

One criticism of research into cultivation theory is that this work is often atheoretical, relying almost exclusively on survey methods to describe an effect without explaining why they may occur (Morgan & Shanahan, 2010; W. J. Potter, 1994). The

¹ Because this research examines mass media as a system, such work necessarily includes fictional programs, as well as other media, such as local news, talk shows, and reality shows. While I argue in subsequent sections that the distinction between fiction and non-fiction is not a psychologically significant one, in the present survey, I will focus on studies that examine works of fiction in particular.

availability heuristic is likely one explanation, but it cannot be the only one. People sometimes rely on information in fiction explicitly, i.e. even when they know they are drawing on it. When researchers interviewed prison inmates in Belgium about what they expected when they were first incarcerated, the inmates made explicit references to American movies and TV shows in describing what they had imagined prison would look like (Van den Bulck & Vandebosch, 2003). However, these expectations were often misleading. While prisons and jails depicted by Hollywood are based on older models where the surroundings look industrial, inmates eat in a large cafeteria, and guards are harsh, prisons in Belgium are smaller, most inmates eat meals alone, and guards are unarmed and fairly accommodating. And although people knew these images were not only fictional, but based on a different legal system in a different country, they nevertheless drew on this information in forming expectations and decisions upon entering prison. This phenomenon is currently unaccounted for by current theories in the cultivation theory literature.

Fiction changes behavior in the world. While narratives can be persuasive in shifting people's beliefs and attitudes (Green, Strange, & Brock, 2003), can works of fiction shift the key decisions people make about their lives and families? A body of work inspired by Albert Bandura suggests yes. While Bandura's "bobo doll" experiments and his insight that people can learn complex behaviors through observation are well-known (social learning theory; Bandura, 1971), less discussed are his efforts to apply principles of his theory to produce and study effects of serial dramas (i.e. soap operas and episodic radio shows) in communities as diverse as Mexico, India, Tanzania, and China (Bandura, 2006). Such programs were designed to promote causes such as family planning (Rogers et al., 1999), HIV prevention (Vaughan, Rogers, Singhal, & Swlehe, 2000), egalitarian gender practices (Papa et al., 2000), women's access to education (Bandura, 2006), environmental

sustainability (Bandura, 2002), and more. Many of the 75+ series were quite popular, airing at prime time and enjoying viewerships in the millions. Anecdotally, their impacts were palpable. After a soap opera in Mexico ended with an epilogue where an actor informed the audience how to enroll in a national literacy program, 25,000 people went to the distribution center in Mexico City the next day to learn more. A radio drama in India with 25 million listeners depicted a mother challenging cultural norms in order to advocate for her daughter's education. Listeners of the program launched schools for young women, with teenage girls explaining, "When Taru [the daughter] and her mother can fight harsh circumstances, why can't we?" Explicit mention of plot points and characters from the dramas are well-evidenced when people explain the reasoning behind their choices. And while testing the efficacy of such programs can be difficult to quantify for logistical and ethical reasons (e.g. a true control group may not be defensible), some implementations allow for natural experiments, which do demonstrate effects specific to watching or listening to these programs, as indicated by measures such as national surveys about attitudes, demographic information (e.g. fertility rates), and visits to clinics (Rogers et al., 1999).

This work in shifting people's behavior is evocative of fiction's potential impacts. While theories of observational learning can be applied generally to explain these effects, there remains an explanatory gap in understanding how soap operas can move people to challenge cultural norms or alter the size of one's family. In other clinical and applied settings, novels are "prescribed" to treat depression, and showed comparable effectiveness to other forms of therapy (bibliotherapy; Cuijpers, 1997). Elsewhere, reading groups are used to teach life and coping skills to prison inmates (Billington, 2011). The emphasis in these settings is primarily to design something that works, not to describe how and why it does so; psychological theory for the effects of fiction are scarce.

Organization of the Present Document

Fiction matters, and its consequences seep into people's lives. Intuitively, fictions are like second-hand experiences, albeit often multi-faceted and fantastical. In the primary section of this Major Area Paper, I lay out this intuition more explicitly: *memories of fictional events can be meaningfully considered part of the autobiographical record*. My aim is to delineate a set of understudied phenomena that bears an important relationship to autobiographical remembering. In pursuit of this aim, I knit together relevant past work in the empirical tradition. For the present purpose, I consider forms of narrative fiction—novels, short stories, films, and television shows—together. This decision is both theoretically motivated as well as pragmatic: the psychological processes involved in remembering the events across media types are more similar than they are different, and by combining them, I am able to draw upon a larger body of research. Also, for simplicity, I exclude other formats which might be considered narrative fiction such as video games, interactions in virtual reality environments, musical ballads and acts, multi-paneled visual art, etc.

In the final and exploratory section, I briefly explore possible *differences* between memories of fiction and memory for autobiographical remembering. This work is necessarily speculative, as empirical work examining these distinctions is very sparse. One reason for this is that traditionally, narrative fiction and autobiographical memory have not been studied together, instead housed as fiction and non-fiction books are typically stored in the library: on separate shelves, and thus as separate worlds that rarely interact. However, it is only by first laying out deep and fundamental similarities between these two categories of memory—by removing this common variance, if you will—can we begin to explore true and nuanced differences between personal memories and memories of fiction.

Memories of Fiction are Part of the Autobiographical Record

In the psychological sciences, people's engagement with fiction has been examined from many angles, including: how reading in general and literary fiction in particular contributes to the development of intelligence, how properties of narrative texts affect readers' downstream reports, the characteristics of subgroups of readers, fiction's persuasive impact, interactions between knowledge of real and fictional worlds, use in clinical settings, relationships between people and fictional characters or celebrities (i.e. parasocial interactions), the impact of genre in comprehension, and more². However, few studies have examined memory for the events which occurred in works of fiction (*memories of fiction*) on their own terms. And while it has been suggested that such memories share important qualities with memory for the personal past (Zwaan, 1999; Magliano, Radvansky, & Copeland, 2012; Rubin & Umanath, 2015), memories of fiction have not been examined using the methodologies and measures offered by the field of autobiographical memory.

Here, I argue for the following: that memories of fiction are event memories which should be considered part of the autobiographical record. To preview, my argument begins with the point that there is not a fundamental psychological distinction between fiction and non-fiction, and that representations of both personal memories and fictional ones share a narrative format as well as neural substrates. Events of all kinds—whether constructed through experience, words on a page, or scenes on a screen—are comprehended and

² Keyword searches were conducted using the psycINFO database using Boolean combinations of the terms narrative, fiction, literature, film, movie, television, narrative, event memory, and autobiographical memory e.g. (film OR movie OR television) AND fiction. Results were limited to empirical or quantitative studies, literature and systematic reviews, brain imaging studies, and experimental replications. Results that were classified in the humanities or as psychoanalytic theory were excluded. The nature of the search terms still yielded irrelevant studies (e.g. titles containing: "Fact or **fiction**?"), which were examined on a case by case basis.

remembered as *mental models*, abstract representations of characters, their internal states, and the contexts through which they move. Such mental models become the substance of event memories and autobiographical remembering.

Fictionality Is Not a Deeply Coded Psychological Property

My argument assumes that the incorporation of fictional events into autobiography is not hindered by a monitoring process. After all, there appears to be a critical difference between experienced and fictional events: we do not *believe* the events described in the work of fiction really happened. Indeed, foundational figures in the philosophy of fiction have maintained that fiction is processed differently from nonfiction (Currie, 1990; Walton, 1990). Others have argued that research into fiction and its potential impacts was neglected partly because fiction was assumed to be impotent, as real events seem to obviously overshadow invented ones (Busselle, Ryabovolova, & Wilson, 2004; Potter, 1986). Indeed, it is intuitive that whether something is fictional or not should matter: books come clearly labeled as fiction or nonfiction, films are either based on true events or not, and the true status of a story has consequences for action. For example, a documentary about tragic events might move the viewer to act (e.g. donate money), whereas this would not be possible for a fictional cause. Consider *A Million Little Pieces*, a book publicized as a memoir about recovery from drug use and the second-highest-selling book of 2005. When it was revealed that the author “wholly fabricated or wildly embellished” details in the book, he received widespread condemnation and a blistering response from Oprah Winfrey, who had initially promoted the book (Kakutani, 2006). In this case and others, people cared deeply when a work labeled as fact was revealed to be even partly fictional. In this section, I consider the important question of whether fictionality has cognitive consequences, with an eye to whether events have the potential to be partitioned away from one’s autobiography by

nature of their fictionality. In other words, do our psychological processes care about the distinction between fiction and nonfiction?

Stylistic conventions are not enough. The surface features of books and movies are one place to begin the search for a fiction/nonfiction distinction. Textbooks and novels are written differently, and feature films and documentaries have distinct editing patterns. However, these differences are insufficient. While certain conventions do often indicate books and films as fiction (“indices of fictionality”; Hamburger, 1968), they are not “obligatory, constant, and sufficiently exclusive” enough that they could not be applied to works of fiction as well (Genette, Ben-Ari, & McHale, 1990). In other words, there is enough overlap on any possible index of fictionality between works of fiction and nonfiction to make classification impossible. One reason this is true is that fiction and nonfiction borrow from each other. For example, a writer might produce a novel in the style of a first-person diary, mimicking characteristics of a memoir. Nonfiction writers can also mimic a novelistic style for dramatic effect and engagement; examples of techniques borrowed from fiction by journalists in the last few decades include the use of dialogue, scene-by-scene description, and highlighting a “character’s” point of view (T. Wolfe, 1975; Djikic, Oatley, & Moldoveanu, 2013). Thus, there is often more heterogeneity *within* the classifications of nonfiction and fiction than across this category distinction. John Searle wrote that “there is no textual property, syntactical or semantic, that will identify a text as a work of fiction” (Searle, 1975), which is born out in modern analyses. Thus, there are not reliable signals in works of fiction that mark them as such for psychological processes to depend on.

The influence of paratext. Fortunately for consumers of media, works of fiction almost always come labeled as such. This enveloping information is the *paratext* and typically makes clear whether the events described really happened in the world or not.

Broadly, the term paratext refers to information surrounding or near the work of fiction, such as the cover of the book or opening sequence of a movie (Genette, 1997). Presently, we are interested in paratext which signals the fictional nature of text, video, and even still images.

Do people process information differently when it is labeled as either fact or fiction? This would be consistent with the idea that our cognitive systems are sensitive to *belief* in whether an event occurred. This is evaluated experimentally by holding content constant while manipulating the label of fiction or nonfiction, and looking for subsequent differences in memory, persuasion, emotional responses, or other measures. Generally, I limit this overview to empirical work satisfying the criterion of controlling for content. To preview the conclusion, the empirical evidence on the question of paratext is very mixed. This lack of clarity is partly due to variation in the operationalization across experimental designs and theoretical frameworks. For example, some studies used text as stimuli, while others used video clips or photographs. Most of the text stimuli were narrative in nature, but some were expository. The length and overall quality of narrative stimuli also varied drastically, from stories just a few sentences long, generated by experimenters, to longer excerpts of award-winning novels. However, the general answer to whether paratext matters is, “Maybe a little bit, sometimes.” Finding an effect of framing content as either fiction or nonfiction is comparable to tracking a rare and possibly mythical creature: it is difficult to find, and seems to appear only under a specific set of shifting circumstances. We examine studies looking for effects of memory first, then persuasion and emotional responses. A summary of studies can be found in Table 1.

One foundational study examined the influence of paratext by labeling short narratives as either non-fiction or fiction (Zwaan, 1994). Specifically, instructions for the

respective conditions were, “These stories are all excerpts from news stories... These stories describe important events that happened during the 1980s. Please read these stories just like you would normally read a news story” and “The following text are all excerpts from novels by famous Dutch and other European literary authors. Please read these texts like you would normally read a novel.” In this study, the people read slower when they thought they were reading literary texts relative to news stories. Moreover, people tended to have stronger *surface form* (i.e. verbatim) representations of text in the fiction condition, as measured by successful identification of sentences taken straight from the text, as opposed to close paraphrases, inferences, and distractors. There was also some evidence that readers represented causal information more strongly in nonfiction conditions. The authors suggest that readers may delay thematic interpretation of a text when it is perceived as indeterminate, which can be influenced by reader expectations: in reading a news article, irrelevant information should be quickly disregarded, but in a literary text, what is or is not relevant to the plot or themes is more ambiguous. This might push readers to maintain the less abstract surface form representations when the text is presented as literary.

Another study³ showed that when interviews from an NPR feature were framed as people talking about jobs they really held versus imagining what it would be like if they did had that job (e.g. flight attendant, medicine woman), people’s retellings of these interviews were on average 1.5 times longer for the imagine (i.e. fiction) condition (Hendersen & Clark, 2007). This effect disappears when the designation of fiction or nonfiction is given after participants read the text, suggesting that the effect is not due to a shift in retelling strategies at retrieval, but perhaps a different process at encoding. This may offer

³ Note that this work was reported in a conference proceeding, and to my knowledge, has not been otherwise published.

additional support for the idea that fictional processing may preserve more of the surface form of a text. However, other work is mixed on whether paratext affects memory. For example, McDaniel and colleagues use Grimm's fairy tales to investigate different aspects of memory for narratives (McDaniel, Hines, Waddill, & Einstein, 1994). In one study, a fairy tale was edited to fit a more modern context, and great pains were taken to make the story appear to be part of a newspaper (McDaniel et al., 1994, Experiments 4a and 4b). McDaniel et al. went as far as to use the campus newspaper's production facility to typeset the story. When this newsy version of a fairy tale was compared to the classic one, there was no effect of the paratext manipulation on either reading time or patterns of free recall.

Does paratext affect persuasion? A body of work demonstrates that narratives overall can be highly persuasive i.e. effective at changing people's beliefs and attitudes on related topics (Green et al., 2003; Shen, Sheer, & Li, 2015; Appel, Gnambs, Richter, & Green, 2015). Here, we consider a related but distinct issue: are texts labeled as true more persuasive than ones labeled as fictional? In one study examining this question, participants read a longer narrative from the perspective of a character who is considering dropping out of high school (Strange & Leung, 1999). No differences were found as a function of framing the story as an excerpt from a news story versus a literary magazine on judgments related to the story, such as listing the common causes of high school failure and what policy makers should do to address issues in K-12 education. Another study framed a more expository text as either a speech given by a real person or a fictional character on television, and found both framings to be similarly persuasive, even when the topic was manipulated to be of high personal relevance to participants (Green, Garst, Brock, & Chung, 2006). This parity also holds when participants explicitly state that they expect factual texts to be more useful and trustworthy (Appel & Malečkar, 2012). Additional work and theories corroborate the idea that paratext has little effect on persuasion (Genette et

al., 1990; Mikkonen, 2006; Wheeler, Green, & Brock, 1999). Some studies suggest that individual differences may come into play. For instance, Green et al. found that participants who scored high in need for cognition⁴ were sensitive to manipulations of argument strength such that they found strong arguments to be more persuasive, regardless of whether they were labeled as fact or fiction (Green et al., 2006). Participants who scored low in need for cognition, in contrast, were not sensitive to argument strength, suggesting that for at least some people, work labeled as fiction may be scrutinized less; this direction merits follow-up work and clarification.

Does paratext have an effect on emotional impact? One might intuit that real events—having truly occurred—should elicit stronger emotions than fictional ones. On the other hand, fictional events might allow for a “distancing” that allows the reader or viewer to more safely embrace certain emotions (Menninghaus et al., 2017). However, there is not strong evidence of differences in emotional response as a result of manipulating paratextual information. One study compared students who watched a documentary (*The Triumph of Evil*) or a feature film (*Hotel Rwanda*) about violence in Rwanda (LaMarre & Landreville, 2009). While these conclusions should be taken cautiously as the content varies between conditions, the authors found that participants who saw the documentary rated themselves as feeling slightly guiltier. However, the remaining measures of disgust, interest, engagement, and performance on a quiz did not differ. Two studies using video clips, one including physiological measures, failed to find consistent effects of paratext. In one of the studies, participants watched video clips from sad television shows framed as fictional or based on real events in addition to describing “the saddest thing” they could remember

⁴ “Need” for cognition is an individual difference measuring the tendency for someone to engage in and enjoy thinking (Cacioppo & Petty, 1982). Participants high and low in need for cognition in Green et al. (2006) were determined using a median split.

happening in their life (Goldstein, 2009). Remarkably, participants' ratings on their emotional responses from their own life did not differ from ratings of video clips labeled as real or fictional, which in turn did not differ from each other. However, participants did report a higher level of anxiety for the sad autobiographical memory compared to the television clips.

Table 1. Studies comparing the effect of paratext

Study	Stimulus Type	Primary Measures	Effect of paratext?
Zwaan, 1994	Text: narrative	Reading and response times	Yes
McDaniel et al. 1994	Text: narrative	Reading time, free recall	No
Hendersen & Clark, 2007	Text: interviews	Free recall	Yes
Slater, 1990	Text	Persuasion (beliefs about social groups)	Some conditions
Murphy, 1998	Text: narrative	Persuasion (judgement of political situation)	Some conditions
Strange & Leung, 1999	Text: narrative	Persuasion (beliefs about education)	No
Green et al., 2006	Text: expository	Persuasion	No
Appel & Maleckar, 2012	Text: narrative	Persuasion (beliefs about the mentally ill)	No
Mendelson & Papacharissi, 2007	Photographs	Emotion	Some conditions
Goldstein, 2009	Audiovisual	Emotion ratings	No*
Marre & Landreville, 2009	Audiovisual	Emotion (disgust, guilt), Interest, engagement, quiz performance	Yes, guilt only
Sperduti et al., 2016	Video	Emotion ratings, physiology	Some conditions
Hartung et al., 2017	Text: narrative	Reading time, memory for events, appreciation	No

These results are not definitive on the question of whether and how *belief in the occurrence of events* affects cognitive processing. One concern with many of these studies is that they may be manipulating the goals and purpose readers bring to the text or video, rather than precisely isolating the effects of believing whether an event occurred. For example, several experiments manipulate fiction-nonfiction by instructing the participant to read text as they might typically consume the news or a novel (e.g. Zwaan, 1994). In

addition to changing belief in the events described, these manipulations are also likely to shift how readers process the text in other ways. For example, people often approach newspapers with the goal of gleaning information quickly, and literary stories with the goal of processing and interpreting broader themes. However, expectations are distinct from the question of *belief*. These differing approaches in goals could explain, for instance, longer reading times for texts framed as literary, without truly relying on the fiction-nonfiction distinction. And while it might be difficult to disentangle reading (or watching) goals from the question of paratext, as people often *do* bring distinct goals to works of fiction and nonfiction, it is important to note that these constructs are distinct. For example, sometimes fiction can be read to learn about the world, and nonfiction can be read for diversion and entertainment. It should also be noted that this issue is not necessarily a flaw in the design of the cited studies. The experiments described by Zwaan et al. purport to examine *genre expectations*, which they do, but do not offer strong evidence on the more specific question of fiction versus nonfiction.

One well-executed attempt was recently made to distinguish between the issue of fictionality as opposed to reader goals and expectations (Hartung, Hagoort, & Willems, 2017). The authors address potential issues of previous work by including: a manipulation of paratext that does not explicitly give readers' distinct goals between conditions, multiple dependent measures, high-quality literary stimuli, a convincing back story for both fiction and nonfiction conditions, and a large sample ($N = 1,742$). In a compromise between using experimenter-generated texts (which can be manipulated and are novel to participants, but often lack literary qualities) and published works of fiction (which readers could be familiar with and may not be easily manipulated), Hartung et al. used narratives written for the study by a creative writer. The respective instructions for the nonfiction and fiction

conditions were, “You are going to read a story about Martin Rombouts. He is a young Dutch columnist. He writes about his everyday life, always inspired by a real event” and “You are going to read a story from Martin Rombouts. He is a young Dutch writer. He writes short fictional stories that are inspired by his imagination.” The fiction/nonfiction manipulation had no effect on any of the dependent measures, which included: reading time, degree of narrative immersion (as measured by the story world absorption subscale; Kuijpers, Hakemulder, Tan, & Doicaru, 2014), appreciation, or performance in a memory task.

While one experiment does not close this question for further investigation, the mixed nature of previous results combined with the rigor of the research by Hartung et al. suggests that people’s cognitive processes are not particularly sensitive to the question of whether described events really happened in the world or not. It appears that the fiction–nonfiction distinction is not a deeply coded one. While this finding may be counterintuitive, it becomes less surprising in the context of other research. Our cognitive systems are likely built, in a Spinozan fashion, on an assumption of truth, in that not believing a falsehood requires an active second step after initial belief (Gilbert, 1991; Asp et al., 2012). This can be applied to works of fiction as well, meaning that accepting fictional information as true is the default, in contrast to the lay conception that disbelief must “suspended”. Moreover, applying a more critical lens may run counter to the goals people bring to fiction, such as following the narrative, emotional involvement, and overall enjoyment. This is supported by work demonstrating that people are less likely to notice false notes if they are more transported into the narrative (Green & Brock, 2000).

Of course, the idea that paratext has very limited effects does not mean that “anything goes” in works of fiction: novels, movies, and television shows ring true in ways that do not necessarily have to do with literal correspondence to the real world. For

example, some have argued that while fictionality does not affect the processing of narratives, people do attend carefully to the *perceived realism* of works of fiction, and are quick to respond if the story feels false (Busselle & Bilandzic, 2008). Communication research has described a variety of judgments which contribute to perceived realism, such as plausibility (the extent to which an event could exist), probability (the frequency with which such events might occur), internal coherence (e.g. lack of inconsistencies), and more (Busselle et al., 2004). Other research has also found that people, beginning at a young age, distinguish between the perceived reality of characters versus that of events (Hawkins, 1977). Indeed, writers and creators of fiction have long played with different notions of realism, with genres such as fantasy and science-fiction working entirely within the realm of the impossible. However, within the context of wars in space and hobbits in holes, the relationships between characters tend to be realistic, with people responding to betrayal or frustration as one might expect. While a more thorough consideration of different notions of truth is beyond the present scope, it is clear that while consumers of fiction do not necessarily distinguish between fiction and nonfiction cognitively, they do attend to other, complex notions of truth and reality.

Narratives and Autobiography

I have argued in the preceding section that while fiction and nonfiction may be useful labels for bookshelves, this boundary category is not psychologically privileged. However, a distinction that appears to be critical is the one between narrative and non-narrative. While this line is theoretically distinct from the division between fiction and non-fiction—a good history book is often narrative in nature, and one could formulate even an instruction manual into a narrative if pressed to do so—the vast majority of fiction does come in a narrative form, while much of nonfiction is more expository in nature. It is

possible that people's intuitions about deep differences between fiction and non-fiction are derived from the differences between narratives and non-narratives.

Jerome Bruner wrote that "A good story and a well-formed argument are different natural kinds" (1986, p. 11). For example, consider the logical proposition "if x, then y" compared to "The king died, and then the queen died." Loosely, narratives involve an event or series of events linked in a causal structure, whereas exposition outlines an argument or explanation (Graesser, Millis, & Zwaan, 1997; Mar, 2004). This dichotomy laid out by Bruner, among others, has converging empirical evidence. One line of support comes from McDaniel and colleagues, who argue that properties of the text will tend to afford different types of processing. In particular, the material appropriate processing framework (MAP) distinguishes between *propositional processing*, which deals with individual ideas, and *relational processing*, which has to do with the relationships between ideas (McDaniel & Einstein, 1989). Both propositional and relational processing are part of successful text recall, but texts tend to encourage one type of processing more than other. Support for this framework is found when encoding manipulations improve memory for certain types of text but not others, with the underlying logic being that if a text already affords relational processing, a manipulation that also draws attention to the relationships between ideas will not further improve performance. For example, having participants reorder sentences of a text is assumed to encourage relational processing, and reading a text with many of the letters missing (while maintaining legibility) encourages propositional processing. Because narratives already encourage holistic processing, a sentence reordering manipulation does not improve recall; however, presenting a fairy tale with missing letters does help (McDaniel, Einstein, Dunay, & Cobb, 1986; McDaniel et al., 1994). A reverse pattern is found for propositional text.

Other work directly compares expository versus narrative texts. One study examined narratives and essays, and used a “think-aloud” procedure in which participants verbalized thoughts and associations while reading (Narvaez, Van Den Broek, & Ruiz, 1999). These comments were recorded and coded into categories such as repetitions, predictions, evaluations (e.g. “I think that’s a strong assertion”), and associations (e.g. “This reminds me of a planetarium show I saw”). Narvaez et al. found that expository texts took participants longer to read and elicited more of certain comments compared to narrative ones. Other work shows differences in how prior knowledge is integrated between narrative and expository formats (Wolfe & Mienko, 2007), and that there are neural differences in how these formats are processed (Baretta, Tomitch, MacNair, Lim, & Waldie, 2009). Narratives and non-narratives also show developmental differentiation. Comprehension and production of narrative tends to happen earlier (Berman & Katzenberger, 2004), and educators often need to take more explicit steps to teach students how to successfully comprehend and produce expository texts compared to narrative ones (Kucer, 2011).

Linking fiction and autobiography through narrative. Young children recount past experiences in conversation in a narrative format, and they form strong emotional attachments to events and characters as young as two years of age (Alexander, Miller, & Hengst, 2001; Fivush & Fromhoff, 1988; Miller & Sperry, 1988; Eisenberg, 1985). The early development of narrative offers some evidence for the primacy of this format in every day cognition, which can also be found in common experiences: we dream in stories, discuss our day with friends and loved ones in narratives, and consume news about the world in a narrative form. And when the credits roll on a movie or the last page of a novel is turned, we can feel as if we have experienced the events ourselves. One reason for this is that works of fiction and autobiographical memories share a common *narrative* format, one that is

distinct from argument or logic-based representations, as argued above. This idea has been suggested by several psychologists (Brown, 1990; Bruner, 1991; Fivush, Fivush, & Haden, 2003; Sarbin, 1998) and pondered by scholars in the humanities (Arendt, 2013; Mitchell, 1981). Whether or not autobiographical memories are stored *as* narratives or constructed from component parts into a narrative when recalled, autobiographical memory researchers have conceptualized people's memories of themselves as stories since the field's inception (Barclay, 1996; Rubin, 1996).

Do memories of fictional events follow autobiographical rules? Here, I peer down the other end of the telescope. If narrative formats are shared between memories of lived experiences and memories of fiction, then not only should insights from narratology be applicable to studying autobiographical memory (Neisser & Fivush, 1994; Trabasso & Sperry, 1985; Trabasso & van den Broek, 1985; van den Broek, 1988), but the reverse should be true as well: memory of events from fiction should mimic patterns of autobiographical memory. While there are relatively few psychological studies examining memory for works of fiction, what does exist suggests that memories for fiction mirror autobiographical memory in at least two ways: events are organized according to similar cues, and a reminiscence bump emerges when remembering across the lifespan.

Autobiographical events can be organized by several indices, which include location (remembering the last visit to Disney World), person (the first time you met a significant other), and time (what happened last New Year's Eve). Prior research shows that although autobiographical memories may be organized into time periods (e.g. time in college) and people are more-or-less accurate when dating their own memories (Janssen, Chessa, & Murre, 2006; Rubin & Baddeley, 1989), time is generally a poor cue for memory retrieval because it is likely not stored directly in memory as a single code (Conway & Bekerian,

1987; Friedman, 1993; Larsen, Thompson, & Hansen, 1996). Rather, evidence suggests that temporal information is actively and repeatedly constructed by using other cues as constraints, such as details about the event (e.g. It was definitely casual *Friday* because Divya was wearing jeans), the people present (e.g. My aunt only visits me during *Thanksgiving*), or even the weather. Indeed, these kinds of inferences are reported when participants are probed about their strategies for dating personal memories (Friedman, 1993). A reconstructive theory of memory for time can also explain odd patterns of errors people tend to make, which would not be predicted if temporal information was stored directly and decayed linearly (Friedman & Wilkins, 1985). In one study, people were asked to estimate the time an earthquake had occurred 9 months prior (Friedman, 1987). While people were generally accurate to within 1 hour of when the earthquake happened when judging the time of day, they were nearly 2 months off on average when judging the month. This pattern of dramatically reduced accuracy at coarser time scales compared to narrower ones is typical of such *scale effects*, reflecting a sensitivity to cyclic information in inferring information about time. In the absence of such landmarks, there is generally poorer retention of temporal information in autobiographical memory compared to memory for people and places (Friedman, 1993, 2004), and recent work suggests the same pattern holds true for simulations of the future (D'Argembeau, Jeunehomme, Majerus, Bastin, & Salmon, 2014; De Brigard, Gessell, Yang, Stewart, & Marsh, in preparation).

Is information about narrative organized similarly? One experiment directly pitted person and temporal characteristics against each other as organizational cues in memory. Taylor & Tversky designed stories in which character and time are symmetrical, and thus should *a priori* serve equally well as ways to index the events in the story (Taylor & Tversky, 1997, Experiment 1). People read vignettes (e.g. about a retirement home) organized by

character or time. For example, the character-oriented story described each character's day in sequence (e.g. reading about Arnold's entire day, then about Marvin's and Jerry's), whereas temporally ordered stories described what all characters did at a given time (e.g. reading about what Arnold, Marvin, and Jerry all did in the morning before learning about everyone's afternoons). Three data points suggest that participants prioritized the cues about people rather than time. One, it took longer for participants to read the temporally organized story compared to the character-oriented one. Two, when participants were asked in two tasks to indicate whether pairs of events were performed by same or different times or by the same or different characters, participants responded more quickly on the character-focused task. And three, when participants were asked to draw a diagram on a blank sheet of paper to represent the information they read, they tended to draw the diagrams organized by character, even if this meant remapping the temporally ordered story they read into a character based map.

Moving from recall cues, another pattern typical of autobiographical memory is the *reminiscence bump* (Rubin, Wetzler, & Nebes, 1986; Rubin & Schulkind, 1997; Rubin, Rahhal, & Poon, 1998). This robust phenomenon is found when older adults are asked to report important events from their life or to recall events based on neutral cue words (see Koppel & Berntsen (2015) and Koppel & Rubin (2016) for recent reviews). The typical shape of a reminiscence bump from lived experience is shown in the left panel of Figure 1, along with an effect of recency. Early explanations for this phenomenon included: the bump comes from forming one's identity (Conway, 2005), is the result of a peak in physiological and cognitive functioning (Rubin et al., 1998), is a function of novelty (Rubin et al., 1998), is a marker of life transitions (Conway & Haque, 1999), or is the result of using life scripts (Berntsen & Rubin, 2004).

Figure 1. The left panel is from (Rubin & Schulkind, 1997), describing the initial characterization of the reminiscence bump in Rubin et al, 1986 and its subsequent replication. The right panel is from Copeland et al, 2009, depicting events from the novel *The Stone Diaries*.

Will people show a reminiscence bump when remembering a work of fiction? Note that, in addition to personal events, people also show a reminiscence bump for media consumed during adolescence, including music, television shows, books, and works of fiction generally (Holbrook & Schindler, 1989; Janssen, Chessa, & Murre, 2007). However, the question currently at hand is distinct from this phenomenon. Rather than considering memory for specific works of fiction, we are considering how people will recall events from the life of a character. One experiment has examined this question, in which participants read *The Stone Diaries* by Carol Shields (Copeland, Radvansky, & Goodwin, 2009). Critically, the ten chapters of the novel proceed chronologically through a woman's life. A few days after reading the novel, participants completed a variety of memory tasks, which included summarizing the novel in a freeform way, recalling events in response to cued words or names, listing details from major events of the novel, and answering short answer questions. The results of collapsing and normalizing these memory measures are shown in the right panel of Figure 1.

Of note are two bumps in memory corresponding to chapters 3 and 6, which refer to when the protagonist is about 20 years old (i.e. young adulthood, within the range of a classic reminiscence bump) and when the protagonist experiences a life transition around 50 years of age, respectively. The second bump is also consistent with the autobiographical memory literature, which shows that a “second bump” corresponding to major life transitions is sometimes seen (Conway & Haque, 1999)⁵.

In addition to revealing a similar patterns between memory for the experienced lifespan and a fictional story, this result is also interesting because it is not consistent with some of the explanations that have been offered for the reminiscence bump. It is unlikely this bump was due to identity formation, as participants were likely not incorporating the events of the novel they were reading for a study into their own identity. It is also unlikely to be the result of physiological maturation. However, the life script explanation – that people recall details about important events in the narrative “script” of life – *is* consistent with the results here. Indeed, the authors note that participants tended to recall details from the protagonist’s life such as graduation from high school or marriage, but less from later chapters involving themes of hospitalization and death. This is in line with other findings in the autobiographical memory literature demonstrating no reminiscence bump for people’s recollection of negative life events (Berntsen & Rubin, 2004; Rubin & Berntsen,

⁵ The observant reader may note the recency effect in autobiographical memory is absent from narrative remembering. While this effect is interesting, the lack of a recency effect for the novel is far from damning. For one, some studies of autobiographical remembering also do not evince a recency effect, especially when participants are cued to retrieve important memories, rather than by words (Rubin & Schulkind, 1997) or when participants recall memories as a life narrative (Fromholt et al., 2003). There is a hint of a recency effect when only the results from the cued recall task were analyzed, which is the recall task most similar to the Galton word cueing technique used for autobiographical remembering. When collapsing across recall tasks, it is possible that such an effect was washed out.

2003). Thus, this is an instance where studying memory for fictional events can suggest evidence for theories of memory more broadly, although such evidence is not definitive.

Similar Neural Representations

So far, we have discussed how fiction/nonfiction is not a key psychological distinction, while narrative/non-narrative is. Both memories of fiction and of lived experience share this narrative format, and memories of fiction follow similar rules. Another line of evidence supporting the idea that memories of fiction can be incorporated into the autobiographical record is based on neural similarities between consuming fiction and action and perception in the world. Seeking generalizable answers to questions about the mechanisms of perception, memory, and cognition, researchers in the neurosciences often use fictional stimuli as stand-ins for real life experience. For example, an episode from television's *Curb Your Enthusiasm* was used as naturalistic stimuli to investigate how memory for events decays over weeks and months (Furman, Dorfman, Hasson, Davachi, & Dudai, 2007). Chen et al. (2017) used the pilot of TV drama *Sherlock* to examine how neural representations are shared between people; Nummenmaa et al. (2012) examined the synchrony of emotion-processing using films *When Harry Met Sally* and *The Godfather*; and Yeshurun et al. (2017) utilized a J. D. Salinger short story to investigate how beliefs impact the interpretation of events.

Of course, the aim of these studies and more like them (e.g. (Bartels & Zeki, 2004; Hasson, Ghazanfar, Galantucci, Garrod, & Keysers, 2012; Hasson, Nir, Levy, Fuhrmann, & Malach, 2004; Kauppi, Jääskeläinen, Sams, & Tohka, 2010; Koster-Hale & Saxe, 2013; Lahnakoski et al., 2012; Mobbs et al., 2006; Whittingstall, Bartels, Singh, Kwon, & Logothetis, 2010) is not a thorough description of Larry David sitcoms or feature films. Rather, the goal is to describe neural processes generalizable to the world at large.

This assumption rests on a body of research demonstrating similarities in neural responses between fictional stimuli and perception and action in the world. One well-characterized phenomenon is that there are similar sensorimotor responses between reading or watching a stimulus and performing that action in the world. Classic neuroimaging work demonstrates that reading or hearing simple motor actions such as “kick” or “lick” elicits somatotopic responses in motor cortices (Hauk, Johnsrude, & Pulvermüller, 2004; Tettamanti et al., 2005). In one study (Aziz-Zadeh, Wilson, Rizzolatti, & Iacoboni, 2006), participants read or watched actions relating to the mouth, hand, and foot (e.g. “biting the banana”, “grasping the pen”, “pressing the car break”). Both reading and watching these phrases localized relevant somatotopic areas of interest in the premotor cortex. Recent and evolving work explores language processing at a cellular level, suggesting that motor and somatosensory neurons are involved in understanding sensory and motor actions encoded by verbs (Yang Y. et al., 2017). For a review of such findings in an embodied cognition framework, see Aziz-Zadeh & Damasio, 2008.

While analysis of neural responses to single verbs allows for reliable and relatively precise characterization of responses in the motor and premotor cortices, narratives show that responses to works of fiction can be similar to real world experience at higher levels of processing as well. For example, in one fMRI study, participants read excerpts from *One Boy's Day*, a novel which describes a 7-year-old boy's everyday activities in chunks, such as “Waking Up” and “Music Lesson.” These excerpts were coded for dimensions of interest, including changes in characters' spatial locations, when characters initiate a new goal, and when characters interact with objects (Speer, Reynolds, Swallow, & Zacks, 2009). Composite maps time-locked to the dimensions were created from fMRI data of participants reading these narratives. Overall, they found that brain regions associated with, for

example, grasping and somatosensory hand representations showed increased activation during parts of stories where characters were interacting with objects (e.g. “Raymond laid down his pencil”). Similarly, changes in characters’ goals were associated with increased activity in areas of the temporal cortex previously associated with goal-directed actions, and reading about changes in spatial location were associated with changes in areas of the parahippocampal cortices otherwise related to spatial processing and navigation.

A Common Form of Representation: Mental Models

To claim that memories of fiction constitute a meaningful part of the autobiographical record is to posit a common form of representation between fictional events and ones experienced in the world at large. In this section, I review research motivating and describing the powerful concept of *mental models*, also called *situation models*, which provides key principles for the nature of events both experienced and imagined (Johnson-Laird, 1983; Kintsch & Van Dijk, 1978). For the sake of consistency, I will use the more general term *mental model* for the remainder of this document, although the terms *situation model* and *event model* (Richmond & Zacks, 2017) are often used to describe this idea as well.

Motivation for and definition of mental models. Historically, the conceptual need for mental models arose from people’s responses to text that could not be explained by memory for lower level features of the text itself. Early studies showed that people vary greatly in how often they misidentify (i.e. false alarm to) one pair of sentences compared to another, despite the sentence pairs being superficially very similar (Bransford, Barclay, & Franks, 1972). For example, people rarely mistake the following two sentences as the same:

“Three turtles rested beside a floating log, and a fish swam beneath *them*”
 “Three turtles rested beside a floating log, and a fish swam beneath *it*.”

However, people do frequently mistake the following pair:

“Three turtles rested on a floating log and a fish swam beneath *them*”
 “Three turtles rested on a floating log, and a fish swam beneath *it*.”

Because the pairs of sentences differ by only one word in each case (rested *beside* versus rested *on*), people’s contrasting responses suggest a form of representation beyond the surface form or the text base (ideas of a text). Subsequent research provided accumulating evidence for the existence of this kind of mental representation, described the nature of such representations more precisely (Johnson-Laird, 1983; Kintsch & Van Dijk, 1978), and described mental models’ major dimensions (Zwaan, Langston, & Graesser, 1995). This work frequently examined narratives, in part because reading narrative text was assumed to be similar to everyday experiences (Graesser, Singer, & Trabasso, 1994).

Today, most researchers agree that a mental model captures how an event is represented in the mind, and that the successful construction of a coherent mental model is tantamount to successfully comprehending a text or event (Gernsbacher, Goldsmith, & Robertson, 1992; van der Schoot, Reijntjes, & van Lieshout, 2012; Zwaan et al., 1995). Mental models are an abstract representation of crucial relationships, likely having adaptive value despite their relatively high computational cost because such models have great predictive power (Richmond & Zacks, 2017). This a critical function of an advanced nervous system. Ongoing work examines properties of the proposed dimensions of mental models, which include spatial layout, the protagonist, temporality, causality, and intentionality (e.g. the event-indexing model; Zwaan et al., 1995). I will pay particular attention to the dimensions of spatial layout and the protagonist (i.e. character or agent) here, because the former is well-delineated while raising interesting and relevant issues, and the latter is of particular concern for mental models from fictional sources.

Spatial dimensions. Recent theory suggests that scene-making is essential to the construction of an event of any kind, whether experienced or imagined (Rubin & Umanath,

2015). This brings to increased relevance how people construct and update spatial dimensions in mental models derived from text. Evidence that readers of a narrative can construct and access mental models containing spatial information comes from studies where participants internally represent locations not explicitly stated in the text. For example, participants in one classic study learned the map of a building shown in Figure 2, including the objects in each room (Morrow, Bower, & Greenspan, 1989). Then, they read a narrative written by the experimenters describing a character walking around the building layout they had previously learned. Critically, the text implied that the character walks through some rooms on the way from one location to another (e.g. laboratory to wash room) without explicitly mentioning the *middle* room (the storage area). When the protagonist in the narrative has moved to the new room, participants are asked to determine whether two objects (e.g. LOCKERS and MIRROR) are in the *same* or *different* room, and reaction times are measured.

Figure 2. An example of a map that participants learned, with dotted path added (Morrow et al., 1989)

The key result here has been called the *distance effect*, in which participants' reaction times to probes are a function of distance from where the character was located at that point in the story. In the example given above, participants responded fastest to objects in the wash room, where the character was located at that moment in the narrative. Critically, the next fastest response times were to objects in the storage area, which was never explicitly mentioned by the text. Objects in the laboratory or other, unrelated rooms were still slower.

The study described above required that participants learned the building layout to criterion prior to reading the narrative text, which takes a substantive amount of time, between 30 to 45 minutes. However, readers can also construct these cognitive maps through narrative descriptions, which is closer to what occurs when people read works of fiction (Taylor & Tversky, 1992; Zwaan & Radvansky, 1998). Moreover, once such maps are constructed, they are divorced from the original perspective of the text, as shown by Taylor and Tversky (1992). They demonstrated that people form cognitive maps from either route (e.g. "You are walking down the path and see the art museum on the left...") or survey (e.g. "The art museum is located west of the path...") descriptions, but that once the mental representations are formed, they do not retain the original perspective of the text descriptions.

However, although spatial dimensions are some of the most thoroughly explored in the literature, evidence suggests that naturalistic reading typically does not result in detailed spatial maps. Intuitively, the experimental paradigms described above are not reflective of naturalistic reading, nor are the contrived narratives written by the experimenters reflective of published novels. When people who read *Chronicle of a Death Foretold*, a Gabriel García Márquez novella, were asked to draw a map of what events

occurred, the resulting figures showed inconsistent spatial representations, with one person actually refusing to complete the task, explaining, “I never gave any thought at all to trying to place locations in relationship to one another” (Ryan, 2003). Experimentally, a body of work examines the extent to which some dimensions of mental models are generated spontaneously by readers, whereas others are used when the task specifically calls for it. Generally, while readers do spontaneously generate inferences about characters’ goals and what events lead to others (causality), people do not tend to automatically track spatial locations of objects unless the task specifically requires it (Zwaan & van Oostendorp, 1993; Gray-Wilson, Rinck, McNamara, Bower, & Morrow, 1993; Graesser et al., 1994). Some work suggests that this might occur with age, such that younger adults tend to rely more on representations of the text base while eschewing mental models of the spatial layout, while older adults are more likely to use a constructed situation model (Stine-Morrow, Morrow, & Leno, 2002). Recent research is also consistent with the idea that whether or not spatial aspects are represented in a mental model is dependent on the instructions given to the reader and readers’ goal in processing the narrative (Bailey, Kurby, Sargent, & Zacks, 2017). This difference between fictional narratives and everyday life may arise from situation demands: while one can read a novel quite well without constructing a spatial map, navigating the world requires understanding how to navigate one’s house, or to drive from one place to another. Thus, one would predict that fictional contexts that require spatial knowledge (e.g. the James Bond video game *GoldenEye 007*, which requires navigating maze-like levels; a detective novel where positioning in a room is critical to solving the mystery) would be more likely to elicit distance effects.

Overall, there is ample evidence that people are capable of representing spatial information as a part of a mental model of a situation or event, although whether or not

this happens is heavily dependent on context. Research into this topic remains an active one. However, if readers are inconsistently representing spatial information when reading narratives, what makes up people's mental models?

Character Dimensions. People do not consume fiction because they find it thrilling to map out fictional spaces—people do it for the characters. This is borne out empirically: while people inconsistently form mental maps of layouts in text, they spontaneously track the mental states of characters in complex ways, including their goals and emotions.

Initial evidence of this was found in the same set of experiments which also demonstrated the distance effect for spatial layouts (Morrow et al., 1989). As before, participants learned the layout shown in Figure 2, and read about a character strolling through said layout. However, the critical statements involved the protagonist being physically located in one room, but *thinking* about another. When probed about objects in various rooms, as before, participants responded most quickly to objects in the room that was being thought about, rather than the room the participant was in, suggesting that they were tracking the thoughts of the character. More recently, the hypothesis that people track characters' thoughts when reading a narrative was tested in a more complex paradigm. In short, researchers nested a cognitive psychology experiment *within* a story, and found the predicted psychological effects that would be predicted for the characters in the story to be generally true for the reader (Gunraj, Upadhyay, Houghton, Westerman, & Klin, 2017). Specifically, Gunraj et al. nested a list-wise *directing forgetting paradigm* in the narrative (Bjork, 1970; Titz & Verhaeghen, 2010). In directed forgetting studies, participants study two (or more) lists of words. In the key "Forget" condition, after reading the first list of words, participants are told to disregard it, and that it will not be on the subsequent test. Then, they are exposed to the second list of words. Participants in the "Remember"

condition are not given the instructions to forget the first list. Later, everyone is tested on both lists. The key result is that participants in the Forget condition show a cost for List 1 (the one they were told to disregard) and a benefit for List 2, relative to people in the Remember condition. In other words, people appear to have additional cognitive resources “left over” for List 2 without the burden of List 1. There are several theoretical mechanisms for the directed forgetting effect, which will not be discussed here (Sahakyan & Kelley, 2002; Wylie, Foxe, & Taylor, 2008).

The key question in Gunraj et al.’s study is whether readers will track a character’s mental state well enough to mimic the respective costs and benefits to two lists. In one narrative, a protagonist plans to buy a list of items at one store (e.g. MIRROR, PENCIL, BOTTLE), then decides that such items are unnecessary luxuries. She then makes a new list of items (e.g. HONEY, COFFEE, LUNCH) to purchase at a different store. In the Remember condition, the protagonist buys both sets of items. A second narrative involves a character accidentally studying the wrong vocabulary list in the Forget condition; this story may mimic more closely a directed forgetting experiment in that it is a list of words to be memorized rather than items to be purchased. Across both narratives, a benefit in recall is seen for the second list of words for the Forget condition participants relative to participants who read a narrative where the protagonist had to keep both lists in mind. Differences were not found with regard to the “cost” of List 1, which could be the result of this “secondhand” manipulation being weaker than the typical paradigm. However, the presence of a mnemonic benefit for List 2 provides compelling evidence that readers model the mental states of fictional characters in fairly complex ways.

An important class of mental states is emotions. On one hand, it is clear that works of fiction frequently evoke emotion in viewer, from exalted works of literature to the most prototypical of romantic comedies. Gerrig has referred to reactions from the reader or

audience that arise as a result of being involved in the narrative *participatory responses* (Allbritton & Gerrig, 1991). A canonical example of a participatory response is a scene from a horror movie: a shaky hand of the protagonist reaching for a door knob, the viewer knowing a horrible danger (a homicidal prison escapee, a ravenous ghoul, or the like) lies on the other side, resulting in the viewing feeling the urge to shout, “Don’t do it!” or “Watch out!” Experimentally, it has been demonstrated that the number of participatory responses elicited can be manipulated by altering the level of suspense in a story (Bezdek, Foy, & Gerrig, 2013), and that closer identification with characters tends to make events more suspenseful (Gerrig, 1993).

There is also significant evidence that people track the emotions of characters and respond in kind. Feeling participatory responses (dread about the door, frustration about the character’s obliviousness to a demon behind said door) is distinct from what the character may be feeling (mild curiosity about a shaking doorknob). This nesting of mental states is similar to false belief tasks, where people must distinguish between what is true of the world and what someone falsely believes (Wellman, Cross, & Watson, 2001). When texts and video clips are manipulated to imply one emotion, participants’ reading times slow for sentences that are incongruent with those implied emotions, suggesting that the characters’ emotions were part of the reader’s mental models (Gernsbacher et al., 1992; Töpper & Schwan, 2008; Vega, 1996). This kind of tracking seems to happen automatically during typical reading and movie-watching; in one study where one group of participants were instructed to empathize with the characters, researchers did not find differences between the instructions group and the people who did not receive any instructions (Komeda & Kusumi, 2006). When participants’ brain activity is monitored using fMRI, emotional content elicited activation in the ventromedial prefrontal cortex and the amygdala, and the

types of inconsistencies in emotional information elicited longer reading or verification times in earlier work engaged parts of the brain related to monitoring processes (Ferstl, Rinck, & Cramon, 2005).

Mental models are abstract. A key assumption throughout this research is that the mental models derived from different media (text versus video) and kinds of representation (perceived or imagined) use the same cognitive processes. There are 4 lines of evidence suggesting that mental models derived from these diverse sources are fundamentally the same. One is built on the assumption that these cognitive systems are parsimonious: why have separate systems when there could be just one? In considering evolutionary reasons why we even have the costly mechanism of mental models, Raymond and Zacks (2017) argue that mental models are powerful for *predicting* action in everyday life, which has enormous adaptive value. Being able to incorporate imagined or vicarious models into our personal prediction systems is likely a feature of the system. And since such processes could not have evolved for reading or the consumption of narrative fiction as we know it, it follows that the systems applied to narrative fiction are derived from ones designed for more general use (Boyd, 2009).

Secondly, experimental evidence strongly suggests that the mental models derived from prose-based and visual media are the same. A hint of this kind of agnosticism to medium was seen in work described above, where mental maps are similar whether constructed from survey or route descriptions (Taylor & Tversky, 1992). Other work has compared models derived from text, movies, pictures, or even video games (Gernsbacher, Varner, & Faust, 1990; Magliano, Miller, & Zwaan, 2001; Magliano, Radvansky, Forsythe, & Copeland, 2014; Radvansky & Copeland, 2006), and found that such models exhibit similar properties. Similarly, manipulations affect cognition in similar ways across text

reading and video representation, and such convergence across media that bear few surface similarities (e.g. black text on a white page versus a feature film) is unlikely without assuming a more general structure.

Thirdly, there is evidence linking how well people can form mental models to actual performance of real world tasks. This work provides a needed link between prose and audiovisual stimuli and experience in the world. There is a paucity of research utilizing the latter due to experimental intractability, but work with a population of mentally impaired older adults demonstrates that participants better at mental model formation also show improved performance on naturalistic tasks, which included packing a child's lunch and backpack (Bailey, Kurby, Giovannetti, & Zacks, 2013).

And finally, key models of comprehension posit that such processes are amodal in the sense that they are not dependent on the surface properties of the written text, auditory input, or visual stimulus. Gernsbacher's structure-building framework explicitly posits that comprehension of information involves general cognitive processes, i.e. that the skills of successfully comprehending a text are not just specialized linguistic ones. Evidence for this is found based on a close relationship between understanding written and auditory narratives and nonverbal, picture-based stories (Gernsbacher et al., 1990). This theory has been useful in developing a battery for assessing comprehension of media (Multimedia Comprehension Battery). In general, the structure building framework conceptualizes successful comprehension as the successful building of a "coherent, mental representation, or *structure* of the information being comprehended" (Gernsbacher, 1991). In this view, the text of a novel or the visual input of a television show can be conceived of as instructions for building the mental model, akin to a "doll house" in the mind. One implication of this theory is that once the doll house/mental model is built, there is no longer a need for the

instructions. This prediction is supported by experimental evidence for reduced memory for the surface form of a text once a complete “structure” is built (Gernsbacher, 1991). Overall, the structure building framework theory has strong experimental evidence and supports the idea that mental models are abstract.

The Argument: Fictional Events as Part of the Autobiographical Record

So far, I have argued that mental models are an abstract form of representation, such that lived experience, text, and film all form mental models with similar characteristics. These mental models track intentionality and causality, and are capable of tracking other properties as needed, such as spatial layouts. Additionally, people are surprisingly neutral on the question of *fictionality*: we tend to process narratives and events similarly regardless of their status as fiction or nonfiction. Building from these points, I argue that memories of fiction should be examined as part of the autobiographical record. This is perhaps a counter-intuitive idea, but recent work has expanded the notion of what we might consider autobiographical or episodic memory. For example, our memory for the past is far from a veridical record: it is highly constructive and prone to errors great and small. *False memories*—memories that were believed to have occurred but in fact never did—are, if not rampant, at least unextraordinary (Loftus, 2005; Loftus & Pickrell, 1995). Thus, the notion of *belief* that an event occurred is dissociable from veracity.

More recently, researchers have described memories that have properties of reliving but are no longer believed to have occurred (*non-believed memories*; Mazzoni, Scoboria, & Harvey, 2010; Otgaar, Scoboria, & Mazzoni, 2014; Scoboria, Memon, Gawrylowicz, & Clark, 2015). This type of memory was famously reported by Jean Piaget, who reported having a vivid and detailed memory that a man attempted to kidnap him at the age of 2 while he was out with his nurse. But as an adolescent, Piaget’s nurse confessed to inventing this

story, and he withdrew his belief that this kidnapping event occurred, while retaining properties of vivacity and a sense of reliving for the memory. While such examples were assumed to be rare, more recent work shows that they are relatively common: 20% of respondents in a survey reported at least one non-believed autobiographical memory (Mazzoni et al., 2010). Examples of such events include vivid memories of impossible events (e.g. Santa Claus coming down the chimney) or events that occurred, but to someone else (e.g. a childhood car accident that really happened to sibling). Such memories can be conceptualized as false memories “exposed,” and demonstrate a disassociation between reliving and belief.

False and non-believed memories expand the theoretical space of autobiographical memory by exposing the dimension of *belief* of whether or not an event occurred, as shown as the vertical axis on Figure 3. Another latent and less explored dimension is that of *selfhood*. Recent work by Pillemer and colleagues characterizes the phenomenon of *vicarious memories*, which are recollected memories of events which occurred to someone else, and moreover, are known to not belong to the self i.e. there is no error in source-monitoring. An example might be an anecdote related by a parent so often as to have taken on a life of its own. These vicarious memories can be “borrowed” for a variety of reasons, such as to make a conversation more exciting, or to make enhance one’s social standing (Brown, Cadera, Fields, & Marsh, 2015).

Figure 3. Two dimensions of event memories

The categories of personal memories (memories formed from lived experience), false memories (which are not distinguishable from personal memories to the person remembering), non-believed memories, and vicarious memories populate three of four quadrants in the two-dimensional space formed by the dimensions of *belief* and *self* (Figure 3). While these dimensions are likely continuous in nature, they are shown and discussed as dichotomous here for conceptual ease. Rubin has argued that understanding memory in terms of key dimensions (Rubin, in preparation) can reveal hitherto unstudied aspects of memory; here is an example of that phenomenon. The bottom left quadrant of Figure 3 describes memories of events where the person remembering is not agent, and which the rememberer does not believe to have occurred. This description applies neatly to the present topic, *memories of fiction*.

In order for memories of fiction to demonstrate they can “keep up” with the other forms of event memory described in Figure 3, they should demonstrate similar phenomenological properties, such as a sense of reliving and sensory imagery. Intuitions about the memories of events from one’s favorite novel or movie suggest that such event memories do exhibit phenomenological qualities similar to personal memories. Some prior

research (Gordon, Gerrig, & Franklin, 2009) and my own data bear out this intuition (Figure 4). When cued by concrete nouns to rate qualities of personal memories and memories from works of fiction, people readily ascribed phenomenological characteristics such as reliving, sensory imagery, and knowledge of a spatial layout to memories of fiction. Notably, such ratings exhibit a similar pattern between events derived from lived experience versus fiction, while they are consistently lower than for memories of fiction than for personal memories.

Figure 4. Phenomenological properties of personal and fictional memories. Closed circles (●) refer to personal memories and open circles (○) refer to memories of fiction. Error bars represent standard error of the mean. From Yang, Deffler & Marsh, in preparation.

Moreover, autobiographical memories are more than vivid remembrances: they also have functional significance. Memories of one's personal past are thought to be used for at least three broad categories (Bluck, 2003; Bluck, Alea, Habermas, & Rubin, 2005; Bluck & Alea, 2011): planning and decision-making (directive functions), maintaining a sense of a continuous self over time (self functions), and maintaining and developing relationships (social functions).

Data from diary studies (Marsh & Tversky, 2004) and surveys (Bluck et al., 2005) support the claim that people regularly think and talk about their past experiences in everyday situations. My own research shows that people endorse fictional memories for many of the same functions, albeit at lower rates.

To summarize, I have delineated the set of understudied phenomena that is memory for events which occurred in works of narrative fiction. Memories of the world and narrative are captured by mental models, which are neutral with regard their mode of construction. Moreover, such memories of narratives are relatively insensitive to the issue of fictionality, such that we apply the same cognitive processes regardless of whether events are framed as fictional or not. In other words, the dimension of *belief* as illustrated in Figure 3 might seem *a priori* useful in delineating categories of experience, but in practice may not be a deeply coded psychological distinction. When mental models are remembered, they form the basis of *event memories* (Rubin & Umanath, 2015), which form the lion's share of one's autobiographical record. This provides the framework for motivating how memories of events which never occurred should be considered part of one's autobiography. As a note regarding terminology, I do not propose that the term *autobiographical memory* should be applied to scenes from books or movies; this shift in terminology would not only be confusing, but would not be true to how the term is used in the vast majority of cases, which is memory for events in one's personal past. However, I do claim that memories of fiction are of the same fundamental type or natural kind as prototypical autobiographical memories, exhibiting similar properties, functions, and downstream effects on judgements and behavior.

Differences Between Fictional and Experienced Events

Thus far, I have drawn almost exclusively similarities between memories of fictional events and ones that were personally experienced. Now, I will explore some of the differences, which are quite exploratory and speculative. The list in Table 2 and the discussion following are not intended to be exhaustive, but rather motivational – there is much ground left to be covered.

Table 2. Some proposed differences between memories of fiction and personal memories

<i>Memories of Fiction</i>	<i>Memories of Lived Experience</i>
can be re-experienced	only happen once
can be shared	unique to a single perspective
direct access to mental states of others	no access to mental states of others
already packaged as narrative	unconstrained by event/story
impossible events can occur	constrained by natural laws
time is not constrained	time moves linearly
aesthetics is a factor	aesthetics is not a factor
no personal responsibility/distancing possible	higher personal stakes
not subject to standards of correspondence truth	subject to standards of correspondence truth
may be less scrutinized	may be more scrutinized
event is nested e.g. the memory of sitting in a movie theater watching Yoda train Luke Skywalker	memories are not nested

Fictional Formats Allow for Re-Experiencing and Sharing

Motivational posters encourage people to “seize the day,” because moments in life are ephemeral: they cannot be re-experienced outside of the domains of our imperfect memories. Works of fiction, on the other hand, come in packages that can be relived in their original form, as many times as one cares to re-engage in the experience. What are the cognitive consequences of this difference? One possibility is people may be more accurate in their memories for fiction compared to their personal memories when they have been exposed to the fictional experience repeatedly. This comparison is experimentally difficult,

as evaluations of people's accuracy for remembering their own lives can be difficult to capture, but it is not impossible: diary studies and experiments in which participants wear cameras throughout the day are a couple of approaches that have been used in the past.

The fact that fiction comes packaged also leads to another property: a fictional experience can be directly shared with others, from a few people to millions. Of course, people share experiences all the time, such as attending a rock concert together. However, even standing side by side, two people might still have slightly different experiences: a chatty and distracting stranger might stand next to one person but not the other, or a tall individual might block only one person's view of the stage. Moreover, written texts in particular describe not only the outside world, but also characters' internal states and experiences, simulating how fictional people attend to and perceive the world, whereas the internal thoughts of two concertgoers may vary quite a bit. While people's participatory responses to fiction are not identical, works of fiction do elicit predictable responses in people, such as empathy for a relatable character, or suspense at a crucial plot point (Allbritton & Gerrig, 1991). Might people's experiences of events in fiction be more similar because these internal worlds are more structured? Neuroimaging work shows synchrony in brain activity between people watching movies and when they recount the events that happened in films (Chen et al., 2017; Hasson et al., 2012; Kauppi et al., 2010). This work shows that people share neural patterns when engaged in films, but it remains to be seen how such patterns of synchrony compare between lived and fictional experiences.

The fact that works of fiction are widely sharable might mean that fictional events can play particularly meaningful roles in social contexts. Indeed, fiction is often the most visible when it brings people together, from *Game of Thrones* watching parties to fandoms for Marvel comic books. Two strangers who otherwise share few experiences or commonalities

can nevertheless have memories of the same fictional event if they have read the same book or watched the same television show. As discussing and sharing events is a way of maintaining social bonds (Jolly, Tamir, Burum, & Mitchell, 2018) and a key function of autobiographical memory (Alea & Bluck, 2007), fiction may play a unique role in fostering social intimacy.

Others' Mental States

In the real world, we do not have access to others' mental states. This is reflected by the fact that proving other humans are truly conscious beings and not automatons (i.e. how do I know that I am not the only conscious person on Earth?) remains a thorny philosophical problem with no consensus solution (Hyslop, 2016). Our knowledge of others' mental lives occurs by generalizing from knowledge of our own cognition (i.e. others' minds work like my own) and making inferences through skills such as theory of mind (Koster-Hale & Saxe, 2013; Leslie, 1987). However, in fiction, we have veridical access to the mental states of other people. In a first-person narrative, we are invited to the narrator's mind; in an omniscient style, we move between the mental lives of multiple characters. The reader's attention is guided not by salience cues in the world, but by the attention of an author/narrator.

One possible consequence of having access to mental states is that reading works of fiction may be a "bootcamp" for improving social cognition, more so than experience in the real world; some have argued that practice following others' minds is the true "function" of fiction (Mar & Oatley, 2008; Oatley, 1999). A lively and ongoing literature supports this idea on two scales. One line of research shows that reading literary fiction compared to non-fiction or non-literary fiction improves immediate theory of mind performance, such as the "Reading the Mind in the Eyes" task (Baron-Cohen, Wheelwright, Hill, Raste, & Plumb,

2001; Kidd & Castano, 2013). A second line of work makes the developmental argument that people who have read more fiction exhibit improvements in social cognition, and that this association is not just correlational, but causal; a recent meta-analysis gathers evidence for this claim (Dodell-Feder & Tamir, 2017).

More precise formulations of the link between fiction consumption and social cognition is ongoing. For example, Kidd & Costano argue that it is only “literary” fiction which will improve social cognition. While such a designation is admittedly a fuzzy quality, K&C argue that this is nevertheless a consequential construct. One way that literariness may be captured is in increased ambiguity: perhaps works of literary fiction tend to depict events that can be interpreted in multiple meaningful ways, when compared to both the real world and genre fiction. This interpretability may translate to particularly powerful training for skills of social cognition. Another open question in this line of research is whether improvements in social cognition is limited to written texts, or whether it extends to visual media. For example, Black and Barnes find participants who watched award-winning television such as *Mad Men* or *West Wing* compared to substantial documentary television shows (e.g. *NOVA Colosseum* or *How the Universe Works*) did better on the Reading the Mind in the Eyes test (2015).

Impossible Events

The world we live in is constrained by natural, physical laws. Not so in narrative fiction, where genres such as science fiction and fantasy on built on undoing the possible and supposing, “What if?” From *Harry Potter* to *Star Wars*, many of the most popular media franchises are based on impossible, or at least highly implausible, premises. What follows from the arguments in this document is that people form mental models of such impossible events described in works of fiction, which can become part of people’s autobiographical

records. And if people do rely on works of fiction to make decisions in their lives, as is suggested by past work, this means—remarkably—that people can and do rely on events that never happened, are known to have never happened, and moreover, could *never* happen in this world.

This allowance for the impossible into autobiographical reasoning has interesting implications. People may preferentially draw on works of fiction when reasoning about unfamiliar contexts. Recall that inmates in Belgium relied on American media to form expectations about prison. They likely did so not because they prioritized fictional representations from another country to factual ones, but because they did not have direct experience to rely on. In fiction, we can have access to worlds removed from our experience in at least three ways. One, we have contact with realistic situations that are distant from our own lives, such as the intimate worlds of physicians or political machinations that take place in the White House, which are popular topics for television programs. Two, we can have fictionalized access to realistic situations that are temporally inaccessible (i.e. the past), such as Victorian England or the French Revolution. And three, we can have access to impossible worlds, which includes imaginations of what the future may look like.

Thus, fiction may have a particular role to play in people's decision-making about policies for the future, including those which involve technologies such as cloning, artificial intelligence, and nanotechnology. The last case serves as a useful case study (Gordon, 2009). People are generally ignorant about the specifics of nanotechnology, but one survey found that fewer than 30% of Americans viewed it as morally acceptable, although current applications of this technology relate to mundane advances such as odor-resistant socks and coatings for hair straighteners (Vance et al., 2015). People also hold strong and negative beliefs about biotechnological advances, such as cloning embryos, based on misleading

information; these views persist when people become better informed about the facts (Nisbet, 2005). Gordon argues that a significant source of negative attitudes about these advancements is science fiction: “Although depictions of emerging technologies in science fiction run the gamut from apocalyptic (e.g. Jeff Carlson’s *Plague Year*, 2007) to optimistic (e.g. William Gibson’s *All Tomorrow’s Parties*, 1999), those that receive the most wide-spread attention are almost uniformly negative (see Collins, 2007, for an overview).” Past work establishes that misinformation is generally quite difficult to correct (Lewandowsky, Ecker, Seifert, Schwarz, & Cook, 2012; Marsh & Yang, 2018), and that fiction is one potential source of misinformation (Butler, Dennis, & Marsh, 2012; Fazio, Dolan, & Marsh, 2015). The present work hints that people may be particularly prone to relying on fiction about unfamiliar or future scenarios. To speculate, the vivacity of event memories derived from works of fiction can be particularly hard to uproot in favor of what are often dry facts about biotechnology. Public opinion can be important for determining policy and funding; misconceptions about the dangers of genetically modified foods or embryonic cloning has consequences for how people eat and the future of biomedical research. In combatting false information spread by memories of fiction, a strategy of “fighting fire with fire” may be needed – could narratives, even fictional ones, be more effect in combatting information than fact-base approaches?

Considerations, Counterarguments, and Conclusion

Finally, I present four previously encountered or anticipated considerations and counterarguments in evaluating the claim that memories of fiction are part of the autobiographical record and thus, should be studied as such, although this collection is certainly not complete.

“Books and movies are very different.” One clear issue is the fact that I have combined studies and theories of varying modalities together. This is at least partly justified, as described above, but some empirical work does suggest differences in memories resulting from prose- versus screen-based stories (Gordon et al., 2009). There are some reasons to believe this might be true. For example, visual imagery is not needed in the perception of visual media; does this difference in what people must imagine or bring to a scene have consequences? Additionally, mental states are more difficult to depict on the silver screen than in writing: while characters’ thoughts can be directly described in text, filmmakers must use devices such as narration to illustrate internal states. The extent to which these and other differences between media have consequences for mnemonic representation is one area for future research.

“Most of what is read is not remembered.” The majority of fiction consumed in day to day life is not recorded in memory; why it should it be considered part of a person’s autobiography? While this concern is certainly true of fiction, it also describes lived experience: we do not remember the vast majority of the moments we experience. Importantly, my claim is not that *all* memories of fiction can be considered part of the autobiographical record: it is that there do exist memories of fiction that can be considered as such, and that this a phenomenon is a frequent and important part of psychological life.

“The content of many fictional works is not significant.” People often consume fiction as entertainment, from Netflix binges to genre thriller novels. One might argue that these activities do not hold significant psychological weight. One response to this concern is a recommendation from William James in outlining how to study religious experience. He noted that such a research program would do well to study the most religious man in his most religious moments (James, 1902). Which is to say that while some who identify as

Christian while only practicing their religion minimally (e.g. attending church only on Christmas Eve), this does not reduce the overall potency of other vibrant religious experiences. Similarly, the fact that fiction is not always meaningful does not mean that it cannot be. A second, non-exclusive reply to the critique of insignificance is that these goal orientations (entertainment, diversion) are interesting in their own right. How and why do people seek an escape into fictional worlds? And thirdly, consuming fictional content for such purposes does not necessarily detract from their potential effects: one can still learn facts from low-brow sources, and such work can still move people's perceptions of the world (i.e. cultivation theory; Shanahan & Morgan, 1999).

“The autobiographical record is, by definition, about the self.” This is perhaps the most serious of the counterarguments enumerated here. Theories and neural evidence suggest that self-relevance lies at the core of what constitutes autobiographical remembering (Cabeza et al., 2004; Chow, Westphal, & Rissman, 2018; Sajonz et al., 2010). The issue of the self is of clear relevance to the study of memory, and makes an appearance as one of two dimensions in Figure 3. My claim here does not exclude the influence of this dimension, but clarifies that it is but one of many relevant factors. Memories of fiction and personal memories use the same cognitive representations and neural substrates, exhibit similar phenomenological qualities (albeit with differences of degree), have functional significance, and are used in everyday life. If one wishes to exclude fictional events from the category of autobiographical remembering based on the single criterion of selfhood, such a distinction is semantic, and is more about where to draw a line in the sand than a substantive theoretical distinction.

Additionally, it is yet unclear the degree to which memories of fiction are truly not about the self. While fictional works do not involve the self as an explicit agent, narratives

can have their impact because people identify with one or more protagonists. Fictional event memories can also be experienced from a first-person perspective, just as personal memories can be experienced from an observer or third-person perspective (Yang & Marsh, 2016). It remains an open question the extent to which the self is or is not involved in remembering fiction, and the answer is likely not all or nothing. It is possible that there could be personal memories (e.g. from before a major life transition) that involve the self in some sense *less* than a fictional narrative in which one heavily identifies with the character. In other words, if it is possible for personal memories and memories of fiction to overlap on the dimension of selfhood, this would make it difficult to assign the label “autobiographical” as a function of whether the self is involved. While some work has argued that fictional characters are by nature less relevant than “real ones,” the experimental conditions in such studies present problems. One study compared family members, public figures (e.g. George Bush), and fictional characters, such as Cinderella (Abraham, von Cramon, & Schubotz, 2008). For this adult sample, Cinderella is a much a much “flatter” individual than family members and even public figures such as George Bush. A study using, for instance, Elizabeth Bennet for a Jane Austen fan as an elaborated and familiar stimulus but low relevance to one’s daily life would provide stronger evidence for the claim that personal relevance and reality are the same. However, because it is likely that the self *is* involved in memories of fiction, in ways big and small (e.g. Sestir & Green, 2010), selfhood is not a useful criterion for excluding memories of fiction from the autobiographical record.

Conclusion

Taking a bird’s eye view of experimental psychology in the 1970s, Allen Newell famously offered prescriptions to the field, one of which was to analyze real tasks in order to gain understanding of a “complex slab of human behavior” (Newell, 1973; Berntsen & Rubin,

2012, p. 12). For others, this “slab” has been mental multiplication (Dansereau, 1969), the game of Go (Silver et al., 2016), or autobiographical memory (Berntsen & Rubin, 2012). Here, it is the phenomenon of remembering works of fiction, which I argue are in theory and in practice part of the autobiographical record.

References

- Abraham, A., von Cramon, D. Y., & Schubotz, R. I. (2008). Meeting George Bush versus Meeting Cinderella: The Neural Response When Telling Apart What is Real from What is Fictional in the Context of Our Reality. *Journal of Cognitive Neuroscience*, 20(6), 965–976.
<https://doi.org/10.1162/jocn.2008.20059>
- Alea, N., & Bluck, S. (2007). I'll keep you in mind: the intimacy function of autobiographical memory. *Applied Cognitive Psychology*, 21(8), 1091–1111. <https://doi.org/10.1002/acp.1316>
- Alexander, K. J., Miller, P. J., & Hengst, J. A. (2001). Young Children's Emotional Attachments to Stories. *Social Development*, 10(3), 374–398. <https://doi.org/10.1111/1467-9507.00171>
- Allbritton, D. W., & Gerrig, R. J. (1991). Participatory responses in text understanding. *Journal of Memory and Language*, 30(5), 603–626. [https://doi.org/10.1016/0749-596X\(91\)90028-I](https://doi.org/10.1016/0749-596X(91)90028-I)
- Appel, M., Gnambs, T., Richter, T., & Green, M. C. (2015). The Transportation Scale–Short Form (TS–SF). *Media Psychology*, 18(2), 243–266.
- Appel, M., & Malečkar, B. (2012). The Influence of Paratext on Narrative Persuasion: Fact, Fiction, or Fake? *Human Communication Research*, 38(4), 459–484.
<https://doi.org/10.1111/j.1468-2958.2012.01432.x>
- Arendt, H. (2013). *The Human Condition: Second Edition*. University of Chicago Press.
- Asp, E., Manzel, K., Koestner, B., Cole, C., Denburg, N. L., & Tranel, D. (2012). A neuropsychological test of belief and doubt: damage to ventromedial prefrontal cortex increases credulity for misleading advertising. *Decision Neuroscience*, 6, 100.
<https://doi.org/10.3389/fnins.2012.00100>

- Aziz-Zadeh, L., Wilson, S. M., Rizzolatti, G., & Iacoboni, M. (2006). Congruent Embodied Representations for Visually Presented Actions and Linguistic Phrases Describing Actions. *Current Biology*, 16(18), 1818–1823. <https://doi.org/10.1016/j.cub.2006.07.060>
- Bailey, H. R., Kurby, C. A., Giovannetti, T., & Zacks, J. M. (2013). Action perception predicts action performance. *Neuropsychologia*, 51(11), 2294–2304. <https://doi.org/10.1016/j.neuropsychologia.2013.06.022>
- Bailey, H. R., Kurby, C. A., Sargent, J. Q., & Zacks, J. M. (2017). Attentional focus affects how events are segmented and updated in narrative reading. *Memory & Cognition; New York*, 45(6), 940–955. <http://dx.doi.org/10.3758/s13421-017-0707-2>
- Bandura, A. (1971). *Social Learning Theory*. New York City: General Learning Press. Retrieved from http://www.asecib.ase.ro/mps/Bandura_SocialLearningTheory.pdf
- Bandura, A. (2002). Environmental sustainability by sociocognitive deceleration of population growth. In *The psychology of sustainable development* (pp. 209–238). Dordrecht, the Netherlands: Kluwer. Retrieved from <http://www.uky.edu/~eushe2/BanduraPubs/Bandura2002.pdf>
- Bandura, A. (2006). Going global with social cognitive theory: From prospect to paydirt. In S. I. Donaldson, D. E. Berger, & K. Pezdek, *Applied psychology: New frontiers and rewarding careers*. Mahwah, NJ: Erlbaum. Retrieved from <http://www.uky.edu/~eushe2/Bandura/Bandura2006Global.pdf>
- Barclay, C. R. (1996). Autobiographical remembering: Narrative constraints on objectified selves. In D. C. Rubin (Ed.), *Remembering our past* (pp. 94–126). Cambridge: Cambridge University Press. <https://doi.org/10.1017/CBO9780511527913.004>

- Baretta, L., Tomitch, L. M. B., MacNair, N., Lim, V. K., & Waldie, K. E. (2009). Inference making while reading narrative and expository texts: An ERP study. *Psychology & Neuroscience*, 2(2), 137–145. <https://doi.org/10.3922/j.psns.2009.2.005>
- Barnes, B. (2017, December 17). ‘Star Wars: The Last Jedi’ Has Second-Biggest Opening Ever. *The New York Times*. Retrieved from <https://www.nytimes.com/2017/12/17/movies/star-wars-the-last-jedi-second-biggest-opening-ever.html>
- Baron-Cohen, S., Wheelwright, S., Hill, J., Raste, Y., & Plumb, I. (2001). The “Reading the Mind in the Eyes” Test revised version: a study with normal adults, and adults with Asperger syndrome or high-functioning autism. *The Journal of Child Psychology and Psychiatry and Allied Disciplines*, 42(2), 241–251.
- Bartels, A., & Zeki, S. (2004). The chronoarchitecture of the human brain—natural viewing conditions reveal a time-based anatomy of the brain. *NeuroImage*, 22(1), 419–433. <https://doi.org/10.1016/j.neuroimage.2004.01.007>
- Berman, R. A., & Katzenberger, I. (2004). Form and function in introducing narrative and expository texts: A developmental perspective. *Discourse Processes*, 38(1), 57–94.
- Berntsen, D., & Rubin, D. C. (2004). Cultural life scripts structure recall from autobiographical memory. *Memory & Cognition*, 32(3), 427–442.
- Berntsen, D., & Rubin, D. C. (2012). *Understanding Autobiographical Memory: Theories and Approaches*. Cambridge University Press.
- Bezdek, M. A., Foy, J. E., & Gerrig, R. J. (2013). “Run for it!”: Viewers’ participatory responses to film narratives. *Psychology of Aesthetics, Creativity, and the Arts*, 7(4), 409–416. <https://doi.org/10.1037/a0034083>

- Billington, J. (2011). "Reading for Life": Prison Reading Groups in Practice and Theory. *Critical Survey*, 23(3), 67–85.
- Bjork, R. A. (1970). Positive forgetting: The noninterference of Items intentionally forgotten. *Journal of Verbal Learning and Verbal Behavior*, 9(3), 255–268. [https://doi.org/10.1016/S0022-5371\(70\)80059-7](https://doi.org/10.1016/S0022-5371(70)80059-7)
- Black, J., & Barnes, J. L. (2015). Fiction and social cognition: The effect of viewing award-winning television dramas on theory of mind. *Psychology of Aesthetics, Creativity, and the Arts*, 9(4), 423–429. <https://doi.org/10.1037/aca0000031>
- Bluck, S. (2003). Autobiographical memory: Exploring its functions in everyday life. *Memory*, 11(2), 113–123. <https://doi.org/10.1080/741938206>
- Bluck, S., & Alea, N. (2011). Crafting the TALE: Construction of a measure to assess the functions of autobiographical remembering. *Memory*, 19(5), 470–486. <https://doi.org/10.1080/09658211.2011.590500>
- Bluck, S., Alea, N., Habermas, T., & Rubin, D. C. (2005). A tale of three functions: The self-reported uses of autobiographical memory. *Social Cognition*, 23(1), 91.
- Borges, J. (2006). *Funes, the Memorious*. Pearson Education.
- Boyd, B. (2009). *On the Origin of Stories*. Harvard University Press.
- Bransford, J. D., Barclay, J. R., & Franks, J. J. (1972). Sentence Memory: A Constructive Versus Interpretive Approach. *Cognitive Psychology*, 3, 193–209.
- Brown, A. S., Croft Caderao, K., Fields, L. M., & Marsh, E. J. (2015). Borrowing Personal Memories. *Applied Cognitive Psychology*, 29(3), 471–477. <https://doi.org/10.1002/acp.3130>

- Brown, N. R. (1990). Organization of public events in long-term memory. *Journal of Experimental Psychology: General*, 119(3), 297.
- Bruner, J. (1991). The Narrative Construction of Reality. *Critical Inquiry; Chicago*, 18(1), 1–21.
- Bruner, J. S. (1986). *Actual Minds, Possible Worlds*. Cambridge, Massachusetts: Harvard University Press.
- Busselle, R., & Bilandzic, H. (2008). Fictionality and Perceived Realism in Experiencing Stories: A Model of Narrative Comprehension and Engagement. *Communication Theory*, 18(2), 255–280. <https://doi.org/10.1111/j.1468-2885.2008.00322.x>
- Busselle, R., Ryabovolova, A., & Wilson, B. (2004). Ruining a good story: Cultivation, perceived realism and narrative. *COMMUNICATIONS-SANKT AUGUSTIN THEN BERLIN-*, 29, 365–378.
- Butler, A. C., Dennis, N. A., & Marsh, E. J. (2012). Inferring facts from fiction: Reading correct and incorrect information affects memory for related information. *Memory*, 20(5), 487–498. <https://doi.org/10.1080/09658211.2012.682067>
- Butler, A. C., Zaromb, F. M., Lyle, K. B., & Roediger, H. L. (2009). Using popular films to enhance classroom learning the good, the bad, and the interesting. *Psychological Science*, 20(9), 1161–1168.
- Cabeza, R., Prince, S. E., Daselaar, S. M., Greenberg, D. L., Budde, M., Dolcos, F., ... Rubin, D. C. (2004). Brain activity during episodic retrieval of autobiographical and laboratory events: an fMRI study using a novel photo paradigm. *Journal of Cognitive Neuroscience*, 16(9), 1583–1594.

- Cacioppo, J. T., & Petty, R. E. (1982). The Need for Cognition. *Journal of Personality and Social Psychology*, 42(1), 116–131.
- Chen, J., Leong, Y. C., Honey, C. J., Yong, C. H., Norman, K. A., & Hasson, U. (2017). Shared memories reveal shared structure in neural activity across individuals. *Nature Neuroscience*, 20(1), 115–125. <https://doi.org/10.1038/nn.4450>
- Chow, T. E., Westphal, A. J., & Rissman, J. (2018). Multi-voxel pattern classification differentiates personally experienced event memories from secondhand event knowledge. *NeuroImage*. <https://doi.org/10.1016/j.neuroimage.2018.04.024>
- Cobb, J. (2018, February 18). “Black Panther” and the Invention of “Africa.” *The New Yorker*. Retrieved from <https://www.newyorker.com/news/daily-comment/black-panther-and-the-invention-of-africa>
- Collins, G. P. (2007). Shamans of Small. <https://doi.org/10.1038/scientificamerican0907-80sp>
- Conway, M. A. (2005). Memory and the self. *Journal of Memory and Language*, 53(4), 594–628. <https://doi.org/10.1016/j.jml.2005.08.005>
- Conway, M. A., & Bekerian, D. A. (1987). Organization in autobiographical memory. *Memory & Cognition*, 15(2), 119–132.
- Conway, M. A., & Haque, S. (1999). Overshadowing the reminiscence bump: Memories of a struggle for independence. *Journal of Adult Development*, 6(1), 35–44.
- Copeland, D. E., Radvansky, G. A., & Goodwin, K. A. (2009). A novel study: Forgetting curves and the reminiscence bump. *Memory*, 17(3), 323–336. <https://doi.org/10.1080/09658210902729491>

- Cuijpers, P. (1997). Bibliotherapy in unipolar depression: A meta-analysis. *Journal of Behavior Therapy and Experimental Psychiatry*, 28(2), 139–147. [https://doi.org/10.1016/S0005-7916\(97\)00005-0](https://doi.org/10.1016/S0005-7916(97)00005-0)
- Currie, G. (1990). *The Nature of Fiction*. Cambridge University Press.
- Dansereau, D. F. (1969). An information processing model of mental multiplication. *Dissertation Abstracts International. B. The Sciences and Engineering*, 30, 1916.
- D'Argembeau, A., Jeunehomme, O., Majerus, S., Bastin, C., & Salmon, E. (2014). The Neural Basis of Temporal Order Processing in Past and Future Thought. *Journal of Cognitive Neuroscience*, 27(1), 185–197. https://doi.org/10.1162/jocn_a_00680
- De Brigard, F., Gessell, B., Yang, B. W., Stewart, G., & Marsh, E. J. (In preparation). Remembering possible times: Memory for details of episodic past, future and counterfactual thinking.
- Djikic, M., Oatley, K., & Moldoveanu, M. C. (2013). Reading other minds: Effects of literature on empathy. *Scientific Study of Literature*, 3(1), 28–47.
- Dodell-Feder, D., & Tamir, D. (2017). Fiction reading has a small positive impact on social cognition: A meta-analysis. *Journal of Experimental Psychology: General*. Retrieved from <http://psnlab.princeton.edu/sites/default/files/publications-pdf/Dodell-Feder-JEPG-inpress.pdf>
- Eisenberg, A. R. (1985). Learning to describe past experiences in conversation. *Discourse Processes*, 8(2), 177–204. <https://doi.org/10.1080/01638538509544613>

- Fazio, L. K., Dolan, P. O., & Marsh, E. J. (2015). Learning misinformation from fictional sources: Understanding the contributions of transportation and item-specific processing. *Memory*, 23(2), 167–177. <https://doi.org/10.1080/09658211.2013.877146>
- Ferstl, E. C., Rinck, M., & Cramon, D. Y. von. (2005). Emotional and temporal aspects of situation model processing during text comprehension: An event-related fMRI study. *Journal of Cognitive Neuroscience*, 17(5), 724–739.
- Fivush, R., Fivush, S. C. P. of P. R., & Haden, C. A. (2003). *Autobiographical Memory and the Construction of A Narrative Self: Developmental and Cultural Perspectives*. Psychology Press.
- Fivush, R., & Fromhoff, F. A. (1988). Style and structure in mother-child conversations about the past. *Discourse Processes*, 11(3), 337–355. <https://doi.org/10.1080/01638538809544707>
- Friedman, W. J. (1987). A follow-up to “Scale Effects in Memory for the Time of Events”: The earthquake study. *Memory & Cognition*, 15(6), 518–520.
- Friedman, W. J. (1993). Memory for the Time of Past Events. *Psychological Bulletin*, 113(1), 44–66.
- Friedman, W. J. (2004). Time in Autobiographical Memory. *Social Cognition*, 22(5), 591–605.
- Friedman, W. J., & Wilkins, A. J. (1985). Scale effects in memory for the time of events. *Memory & Cognition*, 13(2), 168–175.
- Furman, O., Dorfman, N., Hasson, U., Davachi, L., & Dudai, Y. (2007). They saw a movie: Long-term memory for an extended audiovisual narrative. *Learning & Memory*, 14(6), 457–467. <https://doi.org/10.1101/lm.550407>
- Genette, Gerard. (1997). *Paratexts: Thresholds of Interpretation*. Cambridge University Press.
- Genette, Gérard, Ben-Ari, N., & McHale, B. (1990). Fictional Narrative, Factual Narrative. *Poetics Today*, 11(4), 755–774. <https://doi.org/10.2307/1773076>

- Gerbner, G., Gross, L., Morgan, M., & Signorielli, N. (1980). The "Mainstreaming" of America: Violence Profile No. 11. *Journal of Communication*, 30(3), 10–29.
<https://doi.org/10.1111/j.1460-2466.1980.tb01987.x>
- Gernsbacher, M. A. (1991). Cognitive Processes and Mechanisms in Language Comprehension: The Structure Building Framework. In *Psychology of Learning and Motivation* (Vol. 27, pp. 217–263). Elsevier. [https://doi.org/10.1016/S0079-7421\(08\)60125-5](https://doi.org/10.1016/S0079-7421(08)60125-5)
- Gernsbacher, M. A., Goldsmith, H. H., & Robertson, R. R. W. (1992). Do Readers Mentally Represent Characters' Emotional States? *Cognition & Emotion*, 6(2), 89–111.
<https://doi.org/10.1080/02699939208411061>
- Gernsbacher, M. A., Varner, K. R., & Faust, M. E. (1990). Investigating Differences in General Comprehension Skill. *Journal of Experimental Psychology. Learning, Memory, and Cognition*, 16(3), 430–445.
- Gerrig, R. J. (1993). *Experiencing Narrative Worlds: On the Psychological Activities of Reading*. Yale University Press.
- Gilbert, D. T. (1991). How Mental Systems Believe. *American Psychologist*, 46(2), 107–119.
- 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.
<https://doi.org/10.1037/a0015343>
- Gordon, R. (2009). Learning From Fiction: Applications in Emerging Technologies. *Bulletin of Science, Technology & Society*, 29(6), 470–475. <https://doi.org/10.1177/0270467609349054>

- Gordon, R., Gerrig, R. J., & Franklin, N. (2009). Qualitative Characteristics of Memories for Real, Imagined, and Media-Based Events. *Discourse Processes*, 46(1), 70–91.
<https://doi.org/10.1080/01638530802629117>
- Graesser, A. C., Millis, K. K., & Zwaan, R. A. (1997). Discourse comprehension. *Annual Review of Psychology; Palo Alto*, 48, 163–189.
- Graesser, A. C., Singer, M., & Trabasso, T. (1994). Constructing inferences during narrative text comprehension. *Psychological Review*, 101(3), 371.
- Gray-Wilson, S., Rinck, M., McNamara, T. P., Bower, G. H., & Morrow, D. G. (1993). Mental models and narrative comprehension: Some qualifications. *Journal of Memory and Language*, 32, 141–154.
- 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.
<https://doi.org/10.1037/0022-3514.79.5.701>
- 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., Strange, J. J., & Brock, T. C. (2003). *Narrative Impact: Social and Cognitive Foundations*. Taylor & Francis.
- Gunraj, D. N., Upadhyay, S. S. N., Houghton, K. J., Westerman, D. L., & Klin, C. M. (2017). Simulating a story character's thoughts: Evidence from the directed forgetting task. *Journal of Memory and Language*, 96, 1–8. <https://doi.org/10.1016/j.jml.2017.04.005>

- Hall, G. C. N. (2018). Representation Matters. Retrieved April 16, 2018, from <https://www.psychologytoday.com/blog/life-in-the-intersection/201803/representation-matters>
- Hamburger, K. (1968). *Die Logik der Dichtung*. Stuttgart: E. Klett.
- Hartung, F., Hagoort, P., & Willems, R. M. (2017). Readers select a comprehension mode independent of pronoun: Evidence from fMRI during narrative comprehension. *Brain and Language*, 170, 29–38. <https://doi.org/10.1016/j.bandl.2017.03.007>
- Hasson, U., Ghazanfar, A. A., Galantucci, B., Garrod, S., & Keysers, C. (2012). Brain-to-Brain coupling: A mechanism for creating and sharing a social world. *Trends in Cognitive Sciences*, 16(2), 114–121. <https://doi.org/10.1016/j.tics.2011.12.007>
- Hasson, U., Nir, Y., Levy, I., Fuhrmann, G., & Malach, R. (2004). Intersubject Synchronization of Cortical Activity During Natural Vision. *Science*, 303(5664), 1634–1640. <https://doi.org/10.1126/science.1089506>
- Hauk, O., Johnsrude, I., & Pulvermüller, F. (2004). Somatotopic Representation of Action Words in Human Motor and Premotor Cortex. *Neuron*, 41(2), 301–307. [https://doi.org/10.1016/S0896-6273\(03\)00838-9](https://doi.org/10.1016/S0896-6273(03)00838-9)
- Hawkins, R. P. (1977). The Dimensional Structure of Children's Perceptions of Television Reality. *Communication Research*, 4(3), 22.
- Hendersen, D. J., & Clark, H. (2007). Retelling narratives as fiction or nonfiction. In *Proceedings of the Annual Meeting of the Cognitive Science Society* (Vol. 29).
- Holbrook, M. B., & Schindler, R. M. (1989). Some Exploratory Findings on the Development of Musical Tastes. *Journal of Consumer Research*, 16(1), 119–124.

- Hyslop, A. (2016). Other Minds. In E. N. Zalta (Ed.), *The Stanford Encyclopedia of Philosophy*.
Metaphysics Research Lab, Stanford University. Retrieved from
<https://plato.stanford.edu/archives/spr2016/entries/other-minds/>
- Izquierdo, I., & Cammarota, M. (2004). Zif and the survival of memory. *Science*, 304(5672), 829–830.
- James, W. (1902). The Varieties of Religious Experience. Retrieved April 17, 2018, from
<http://xroads.virginia.edu/~hyper/wjames/ch02.html>
- Janssen, S. M., Chessa, A. G., & Murre, J. M. (2006). Memory for time: How people date events. *Memory & Cognition*, 34(1), 138–147.
- Janssen, S. M. J., Chessa, A. G., & Murre, J. M. J. (2007). Temporal distribution of favourite books, movies, and records: Differential encoding and re-sampling. *Memory*, 15(7), 755–767. <https://doi.org/10.1080/09658210701539646>
- Johnson-Laird, P. N. (1983). *Mental Models: Towards a Cognitive Science of Language, Inference, and Consciousness*. Harvard University Press.
- Jolly, E., Tamir, D. I., Burum, B., & Mitchell, J. P. (2018). Wanting without enjoying: The social value of sharing experiences. *PsyArXiv*.
- Jones, N. (2016). Michelle Obama Explains Why Representation in Pop Culture Matters. Retrieved April 16, 2018, from <http://www.vulture.com/2016/08/michelle-obama-on-why-tv-representation-matters.html>
- Kakutani, M. (2006, January 17). Bending the Truth in a Million Little Ways. *The New York Times*. Retrieved from <https://www.nytimes.com/2006/01/17/books/17kaku.html>

- Kauppi, J.-P., Jääskeläinen, I. P., Sams, M., & Tohka, J. (2010). Inter-subject correlation of brain hemodynamic responses during watching a movie: localization in space and frequency. *Frontiers in Neuroinformatics*, 4. <https://doi.org/10.3389/fninf.2010.00005>
- Kidd, D. C., & Castano, E. (2013). Reading Literary Fiction Improves Theory of Mind. *Science*, 342(6156), 377–380. <https://doi.org/10.1126/science.1239918>
- Kintsch, W., & Van Dijk, T. A. (1978). Toward a model of text comprehension and production. *Psychological Review*, 85(5), 363.
- Knippels, M.-C., Severiens, S. E., & Klop, T. (2009). Education through fiction: acquiring opinion-forming skills in the context of genomics. *International Journal of Science Education*, 31(15), 2057–2083. <https://doi.org/10.1080/09500690802345888>
- Komeda, H., & Kusumi, T. (2006). The effect of a protagonist's emotional shift on situation model construction. *Memory & Cognition*, 34(7), 1548–1556.
- Koppel, J., & Berntsen, D. (2015). The peaks of life: The differential temporal locations of the reminiscence bump across disparate cueing methods. *Journal of Applied Research in Memory and Cognition*, 4(1), 66–80. <https://doi.org/10.1016/j.jarmac.2014.11.004>
- Koppel, J., & Rubin, D. C. (2016). Recent Advances in Understanding the Reminiscence Bump: The Importance of Cues in Guiding Recall From Autobiographical Memory. *Current Directions in Psychological Science*, 25(2), 135–140.
- Koster-Hale, J., & Saxe, R. (2013). Functional neuroimaging of theory of mind. *Understanding Other Minds: Perspectives from Developmental Social Neuroscience*, 132–163.
- Kucer, S. B. (2011). Going beyond the author: What retellings tell us about comprehending narrative and expository texts. *Literacy*, 45(2), 62–69.

- Lahnakoski, J. M., Salmi, J., Jääskeläinen, I. P., Lampinen, J., Glerean, E., Tikka, P., & Sams, M. (2012). Stimulus-Related Independent Component and Voxel-Wise Analysis of Human Brain Activity during Free Viewing of a Feature Film. *PLOS ONE*, 7(4), e35215. <https://doi.org/10.1371/journal.pone.0035215>
- 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 & Society*, 12(4), 537–555. <https://doi.org/10.1080/15205430903237915>
- Larsen, S. F., Thompson, C. P., & Hansen, T. (1996). Time in autobiographical memory. In D. C. Rubin (Ed.), *Remembering our past* (pp. 129–156). Cambridge: Cambridge University Press. <https://doi.org/10.1017/CBO9780511527913.005>
- Leslie, A. M. (1987). Pretense and representation: The origins of "theory of mind.". *Psychological Review*, 94(4), 412.
- Lewandowsky, S., Ecker, U. K. H., Seifert, C. M., Schwarz, N., & Cook, J. (2012). Misinformation and Its Correction: Continued Influence and Successful Debiasing. *Psychological Science in the Public Interest*, 13(3), 106–131. <https://doi.org/10.1177/1529100612451018>
- Loftus, E. F. (2005). Planting misinformation in the human mind: A 30-year investigation of the malleability of memory. *Learning & Memory*, 12(4), 361–366. <https://doi.org/10.1101/lm.94705>
- Loftus, E. F., & Pickrell, J. E. (1995). The formation of false memories. *Psychiatric Annals*, 25(12), 720–725.

- Lombrozo, T. (2015). Think Remembering Is Always Best? Forget About It! Retrieved March 23, 2018, from <https://www.npr.org/sections/13.7/2015/09/28/444090182/think-remembering-is-always-best-forget-about-it>
- Luckerson, V. (2016). This Is How Much Netflix We're All Watching Every Day. Retrieved April 5, 2018, from <http://time.com/4186137/netflix-hours-per-day/>
- Magliano, J. P., Miller, J., & Zwaan, R. A. (2001). Indexing space and time in film understanding. *Applied Cognitive Psychology, 15*(5), 533–545. <https://doi.org/10.1002/acp.724>
- Magliano, J. P., Radvansky, G. A., Forsythe, J. C., & Copeland, D. E. (2014). Event segmentation during first-person continuous events. *Journal of Cognitive Psychology, 26*(6), 649–661. <https://doi.org/10.1080/20445911.2014.930042>
- Mar, R. A. (2004). The neuropsychology of narrative: story comprehension, story production and their interrelation. *Neuropsychologia, 42*(10), 1414–1434. <https://doi.org/10.1016/j.neuropsychologia.2003.12.016>
- 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.
- Marsh, E. J. (2004). Story stimuli for creating false beliefs about the world. *Behavior Research Methods, Instruments, & Computers, 36*(4), 650–655.
- Marsh, E. J., Butler, A. C., & Umanath, S. (2012). Using Fictional Sources in the Classroom: Applications from Cognitive Psychology. *Educational Psychology Review, 24*(3), 449–469. <https://doi.org/10.1007/s10648-012-9204-0>
- Marsh, E. J., & Fazio, L. K. (2006). Learning errors from fiction: Difficulties in reducing reliance on fictional stories. *Memory & Cognition, 34*(5), 1140–1149.

- Marsh, E. J., & Fazio, L. K. (2007). Learning from fictional sources. *The Foundations of Remembering: Essays in Honor of Henry L. Roediger III*, 397–413.
- Marsh, E. J., Meade, M. L., & Roediger, H. L. R. (2003). Learning facts from fiction. *Journal of Memory and Language*, 49(4), 519–536. [https://doi.org/10.1016/S0749-596X\(03\)00092-5](https://doi.org/10.1016/S0749-596X(03)00092-5)
- Marsh, E. J., & Mullet, H. G. (2016). Stories and Movies can Mislead: Why Biloxi (Mississippi) Sometimes Relocates to Tennessee After Reading *The Great Gatsby*. In R. A. Nash & J. Ost (Eds.), *False and Distorted Memories*. London: Psychology Press.
- Marsh, E. J., & Tversky, B. (2004). Spinning the stories of our lives. *Applied Cognitive Psychology*, 18(5), 491–503. <https://doi.org/10.1002/acp.1001>
- Marsh, E. J., & Yang, B. W. (2018). Believing Things That Are Not True: A Cognitive Science Perspective on Misinformation. In B. G. Southwell, E. A. Thorson, & L. Sheble (Eds.), *Misinformation and Mass Audiences*. Austin: University of Texas Press.
- Mazzoni, G., Scoboria, A., & Harvey, L. (2010). Nonbelieved Memories. *Psychological Science*, 21(9), 1334–1340. <https://doi.org/10.1177/0956797610379865>
- McDaniel, M. A., & Einstein, G. O. (1989). Material-appropriate processing: A contextualist approach to reading and studying strategies. *Educational Psychology Review*, 1(2), 113–145. <https://doi.org/10.1007/BF01326639>
- McDaniel, M. A., Einstein, G. O., Dunay, P. K., & Cobb, R. E. (1986). Encoding Difficulty and Memory: Toward a Unifying Theory. *Journal of Memory and Language*, 25(6), 645–656.
- McDaniel, M. A., Hines, R. J., Waddill, P. J., & Einstein, G. O. (1994). What makes folk tales unique: Content familiarity, causal structure, scripts, or superstructures? *Journal of Experimental Psychology: Learning, Memory, and Cognition*, 20(1), 169.

Menninghaus, W., Wagner, V., Hanich, J., Wassiliwizky, E., Jacobsen, T., & Koelsch, S. (2017).

The Distancing-Embracing model of the enjoyment of negative emotions in art

reception. *Behavioral and Brain Sciences*, 40. <https://doi.org/10.1017/S0140525X17000309>

Mikkonen, K. (2006). Can Fiction Become Fact? The Fiction-to-Fact Transition in Recent Theories

of Fiction. *Style; DeKalb*, 40(4), 291-313,390,392.

Miller, P. J., & Sperry, L. L. (1988). Early talk about the past: the origins of conversational stories

of personal experience*. *Journal of Child Language*, 15(2), 293–315.

<https://doi.org/10.1017/S0305000900012381>

Mitchell, W. J. T. (1981). *On Narrative*. Chicago. Retrieved from

<http://www.press.uchicago.edu/ucp/books/book/distributed/O/bo3623734.html>

Mobbs, D., Weiskopf, N., Lau, H. C., Featherstone, E., Dolan, R. J., & Frith, C. D. (2006). The

Kuleshov Effect: the influence of contextual framing on emotional attributions. *Social*

Cognitive and Affective Neuroscience, 1(2), 95–106. <https://doi.org/10.1093/scan/nsl014>

Morgan, M., & Shanahan, J. (1997). Two Decades of Cultivation Research: An Appraisal and

Meta-Analysis. *Annals of the International Communication Association*, 20(1), 1–45.

<https://doi.org/10.1080/23808985.1997.11678937>

Morgan, M., & Shanahan, J. (2010). The State of Cultivation Invited Essay. *Journal of Broadcasting*

& Electronic Media, 54, 337–356.

Morrow, D. G., Bower, G. H., & Greenspan, S. L. (1989). Updating situation models during

narrative comprehension. *Journal of Memory and Language*, 28(3), 292–312.

[https://doi.org/10.1016/0749-596X\(89\)90035-1](https://doi.org/10.1016/0749-596X(89)90035-1)

- Narvaez, D., Van Den Broek, P., & Ruiz, A. B. (1999). The influence of reading purpose on inference generation and comprehension in reading. *Journal of Educational Psychology*, 91(3), 488.
- Neisser, U., & Fivush, R. (1994). *The Remembering Self: Construction and Accuracy in the Self-Narrative*. Cambridge University Press.
- Newell, A. (1973). You can't play 20 questions with nature and win: Projective comments on the papers of this symposium. In W. G. Chase (Ed.), *Visual information processing* (pp. 283–308). New York: Academic Press.
- Nisbet, M. C. (2005). The Competition for Worldviews: Values, Information, and Public Support for Stem Cell Research. *International Journal of Public Opinion Research*, 17(1), 90–112.
<https://doi.org/10.1093/ijpor/edh058>
- Nummenmaa, L., Glerean, E., Viinikainen, M., Jääskeläinen, I. P., Hari, R., & Sams, M. (2012). Emotions promote social interaction by synchronizing brain activity across individuals. *Proceedings of the National Academy of Sciences*, 109(24), 9599–9604.
<https://doi.org/10.1073/pnas.1206095109>
- 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.
- Otgaar, H., Scoboria, A., & Mazzoni, G. (2014). On the Existence and Implications of Nonbelieved Memories. *Current Directions in Psychological Science*, 23(5), 349–354.
<https://doi.org/10.1177/0963721414542102>
- Papa, M. J., Singhal, A., Law, S., Pant, S., Sood, S., Rogers, E. M., & Shefner-Rogers, C. L. (2000). Entertainment-Education and Social Change: An Analysis of Parasocial Interaction,

- Social Learning, Collective Efficacy, and Paradoxical Communication. *Journal of Communication*, 50(4), 31–55. <https://doi.org/10.1111/j.1460-2466.2000.tb02862.x>
- Perrin, A. (2018, March 8). Nearly one-in-five Americans now listen to audiobooks. Retrieved April 5, 2018, from <http://www.pewresearch.org/fact-tank/2018/03/08/nearly-one-in-five-americans-now-listen-to-audiobooks/>
- Potter, W. J. (1994). Cultivation theory and research: A methodological critique. *Journalism Monographs*, 147, 1–35.
- Potter, W. James. (1986). Perceived Reality and the Cultivation Hypothesis A Cultivation Symposium. *Journal of Broadcasting & Electronic Media*, 30, 159–174.
- Potts, G. R., & Peterson, S. B. (1985). Incorporation versus Compartmentalization in Memory for Discourse. *Journal of Memory and Language; New York*, 24(1), 107–118.
- Quick, B. L. (2009). The Effects of Viewing Grey’s Anatomy on Perceptions of Doctors and Patient Satisfaction. *Journal of Broadcasting & Electronic Media*, 53(1), 38–55. <https://doi.org/10.1080/08838150802643563>
- Quiroga, R. Q. (2012). *Borges and Memory*. Cambridge, MA: MIT Press. Retrieved from <https://mitpress.mit.edu/books/borges-and-memory>
- Radvansky, G. A., & Copeland, D. E. (2006). Situation models and retrieval interference: Pictures and words. *Memory*, 14(5), 614–623. <https://doi.org/10.1080/09658210600647714>
- Rapp, D. N., Hinze, S. R., Slaten, D. G., & Horton, W. S. (2014). Amazing Stories: Acquiring and Avoiding Inaccurate Information From Fiction. *Discourse Processes*, 51(1–2), 50–74. <https://doi.org/10.1080/0163853X.2013.855048>

- Richmond, L. L., & Zacks, J. M. (2017). Constructing Experience: Event Models from Perception to Action. *Trends in Cognitive Sciences*, 21(12), 962–980.
<https://doi.org/10.1016/j.tics.2017.08.005>
- Rogers, E. M., Vaughan, P. W., Swalehe, R. M. A., Rao, N., Svenkerud, P., & Sood, S. (1999). Effects of an Entertainment-Education Radio Soap Opera on Family Planning Behavior in Tanzania. *Studies in Family Planning*, 30(3), 193–211.
- Roupenian, K. (2017). Cat Person. *New Yorker*. Retrieved from
<https://www.newyorker.com/magazine/2017/12/11/cat-person>
- Rubin, D. C. (in preparation). A Dimensional Organization for Applied, Real-World, and Laboratory Memory.
- Rubin, D. C. (1996). Introduction. In D. C. Rubin (Ed.), *Remembering our past* (pp. 1–16). Cambridge: Cambridge University Press. <https://doi.org/10.1017/CBO9780511527913.001>
- Rubin, D. C., & Baddeley, A. D. (1989). Telescoping is not time compression: A model. *Memory & Cognition*, 17(6), 653–661.
- Rubin, D. C., & Berntsen, D. (2003). Life scripts help to maintain autobiographical memories of highly positive, but not highly negative, events. *Memory & Cognition*, 31(1), 1–14.
- Rubin, D. C., Rahhal, T. A., & Poon, L. W. (1998). Things learned in early adulthood are remembered best. *Memory & Cognition*, 26(1), 3–19. <https://doi.org/10.3758/BF03211366>
- Rubin, D. C., & Schulkind, M. D. (1997). Distribution of important and word-cued autobiographical memories in 20-, 35-, and 70-year-old adults. *Psychology and Aging*, 12(3), 524.

- Rubin, D. C., & Umanath, S. (2015). Event memory: A theory of memory for laboratory, autobiographical, and fictional events. *Psychological Review*, 122(1), 1–23.
<https://doi.org/10.1037/a0037907>
- Rubin, D. C., Wetzler, S. E., & Nebes, R. D. (1986). Autobiographical memory across the adult lifespan. In D. C. Rubin (Ed.), *Autobiographical Memory* (pp. 202–221). Cambridge: Cambridge University Press.
- Ryan, M.-L. (2003). Cognitive Maps and the Construction of Narrative Space. In D. Herman (Ed.), *Narrative Theory and the Cognitive Sciences*.
- Sahakyan, L., & Kelley, C. M. (2002). A contextual change account of the directed forgetting effect. *Journal of Experimental Psychology: Learning, Memory, and Cognition*, 28(6), 1064–1072. <https://doi.org/10.1037//0278-7393.28.6.1064>
- Sajonz, B., Kahnt, T., Margulies, D. S., Park, S. Q., Wittmann, A., Stoy, M., ... Bermpohl, F. (2010). Delineating self-referential processing from episodic memory retrieval: Common and dissociable networks. *NeuroImage*, 50(4), 1606–1617.
<https://doi.org/10.1016/j.neuroimage.2010.01.087>
- Sarbin, T. R. (1998). Believed-in imaginings: A narrative approach. In J. de Rivera & T. R. Sarbin (Eds.), *Memory, trauma, dissociation, and hypnosis series. Believed-in imaginings: The narrative construction of reality* (pp. 15–30). Washington, DC, US: American Psychological Association. Retrieved from <http://psycnet.apa.org/doiLanding?doi=10.1037%2F10303-001>
- Scoboria, A., Memon, A., Gawrylowicz, J., & Clark, A. (2015). Nonbelieved memories across the adult lifespan. *Psychology of Consciousness: Theory, Research, and Practice*, 2(4), 461.

Searle, J. R. (1975). The Logical Status of Fictional Discourse. *New Literary History*, 6(2), 319–332.

<https://doi.org/10.2307/468422>

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.

<https://doi.org/10.1080/15534510.2010.490672>

Shanahan, J., & Morgan, M. (1999). *Television and its Viewers: Cultivation Theory and Research*.

Cambridge: Cambridge University Press. <https://doi.org/10.1017/CBO9780511488924>

Shen, F., Sheer, V. C., & Li, R. (2015). Impact of Narratives on Persuasion in Health

Communication: A Meta-Analysis. *Journal of Advertising*, 44(2), 105–113.

<https://doi.org/10.1080/00913367.2015.1018467>

Short, G. (1997). Learning Through Literature: Historical Fiction, Autobiography, and the Holocaust. *Children's Literature in Education*, 28(4), 179–190.

Shrum, L. J., Wyer, R. S., & O'Guinn, T. C. (1998). The effects of television consumption on social perceptions: The use of priming procedures to investigate psychological processes. *Journal of Consumer Research; Chicago*, 24(4), 447–458.

Silver, D., Huang, A., Maddison, C. J., Guez, A., Sifre, L., van den Driessche, G., ... Hassabis, D.

(2016). Mastering the game of Go with deep neural networks and tree search. *Nature*, 529(7587), 484–489. <https://doi.org/10.1038/nature16961>

Sini, R. (2017, December 11). Cat Person: The short story people are talking about. *BBC News*.

Retrieved from <http://www.bbc.com/news/blogs-trending-42307714>

- Speer, N. K., Reynolds, J. R., Swallow, K. M., & Zacks, J. M. (2009). Reading Stories Activates Neural Representations of Visual and Motor Experiences. *Psychological Science*, 20(8), 989–999. <https://doi.org/10.1111/j.1467-9280.2009.02397.x>
- Stine-Morrow, E. A. L., Morrow, D. G., & Leno, R. (2002). Aging and the Representation of Spatial Situations in Narrative Understanding. *The Journals of Gerontology: Series B*, 57(4), P291–P297. <https://doi.org/10.1093/geronb/57.4.P291>
- Storey, D. C. (1982). Reading in the Content Areas: Fictionalized Biographies and Diaries for Social Studies. *The Reading Teacher*, 35(7), 796–798.
- 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.
- Taylor, H. A., & Tversky, B. (1992). Spatial mental models derived from survey and route descriptions. *Journal of Memory and Language*, 31(2), 261–292. [https://doi.org/10.1016/0749-596X\(92\)90014-O](https://doi.org/10.1016/0749-596X(92)90014-O)
- Taylor, H. A., & Tversky, B. (1997). Indexing Events in Memory: Evidence for Index Dominance. *Memory*, 5(4), 509–542. <https://doi.org/10.1080/741941434>
- Taylor, P., Funk, C., & Craighill, P. (2006). Increasingly, Americans Prefer Going to the Movies At Home, 23.
- Tettamanti, M., Buccino, G., Saccuman, M. C., Gallese, V., Danna, M., Scifo, P., ... Perani, D. (2005). Listening to action-related sentences activates fronto-parietal motor circuits. *Journal of Cognitive Neuroscience*, 17(2), 273–281.

- Thomas, L. (2016). Why Representation Matters. Retrieved April 16, 2018, from <https://www.edutopia.org/blog/why-representation-matters-laura-thomas>
- Titz, C., & Verhaeghen, P. (2010). Aging and directed forgetting in episodic memory: A meta-analysis. *Psychology and Aging, 25*(2), 405–411. <https://doi.org/10.1037/a0017225>
- Töpper, J., & Schwan, S. (2008). James Bond in angst?: Inferences about protagonists' emotional states in films. *Journal of Media Psychology: Theories, Methods, and Applications, 20*(4), 131–140. <https://doi.org/10.1027/1864-1105.20.4.131>
- Trabasso, T., & Sperry, L. L. (1985). Causal Relatedness and Importance of Story Events. *Journal of Memory and Language; New York, 24*(5), 595–611.
- Trabasso, T., & van den Broek, P. (1985). Causal thinking and the representation of narrative events. *Journal of Memory and Language, 24*(5), 612–630. [https://doi.org/10.1016/0749-596X\(85\)90049-X](https://doi.org/10.1016/0749-596X(85)90049-X)
- Tversky, A., & Kahneman, D. (1973). Availability: A heuristic for judging frequency and probability. *Cognitive Psychology, 5*(2), 207–232.
- van den Broek, P. (1988). The Effects of Causal Relations and Hierarchical Position on the Importance of Story Statements. *Journal of Memory and Language; New York, 27*(1), 1–22.
- Van den Bulck, J., & Vandebosch, H. (2003). When the viewer goes to prison: learning fact from watching fiction. A qualitative cultivation study. *Poetics, 31*(2), 103–116. [https://doi.org/10.1016/S0304-422X\(03\)00006-8](https://doi.org/10.1016/S0304-422X(03)00006-8)
- van der Schoot, M., Reijntjes, A., & van Lieshout, E. C. D. M. (2012). How do children deal with inconsistencies in text? An eye fixation and self-paced reading study in good and poor

reading comprehenders. *Reading and Writing*, 25(7), 1665–1690.

<https://doi.org/10.1007/s11145-011-9337-4>

Vance, M. E., Kuiken, T., Vejerano, E. P., McGinnis, S. P., Hochella, M. F., Rejeski, D., & Hull, M.

S. (2015). Nanotechnology in the real world: Redeveloping the nanomaterial consumer products inventory. *Beilstein Journal of Nanotechnology*, 6, 1769–1780.

<https://doi.org/10.3762/bjnano.6.181>

Vaughan, P. W., Rogers, E. M., Singhal, A., & Swlehe, R. M. (2000). Entertainment-Education

and HIV/AIDS Prevention: A Field Experiment in Tanzania. *Journal of Health*

Communication, 5, 81–100. <https://doi.org/10.1080/10810730050019573>

Vega, M. (1996). The Representation of Changing Emotions in Reading Comprehension.

Cognition & Emotion, 10(3), 303–322. <https://doi.org/10.1080/026999396380268>

Wallace, C. (2018, February 12). Why ‘Black Panther’ Is a Defining Moment for Black America.

The New York Times. Retrieved from

<https://www.nytimes.com/2018/02/12/magazine/why-black-panther-is-a-defining-moment-for-black-america.html>

Walton, K. L. (1990). *Mimesis as Make-believe: On the Foundations of the Representational Arts*.

Harvard University Press.

Wellman, H. M., Cross, D. D., & Watson, J. (2001). Meta-Analysis of Theory-of-Mind

Development: The Truth about False Belief. *ResearchGate*, 72(3), 655–684.

<https://doi.org/10.1111/1467-8624.00304>

- 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. <https://doi.org/10.3758/BF03210821>
- Whittingstall, K., Bartels, A., Singh, V., Kwon, S., & Logothetis, N. K. (2010). Integration of EEG source imaging and fMRI during continuous viewing of natural movies. *Magnetic Resonance Imaging*, 28(8), 1135–1142. <https://doi.org/10.1016/j.mri.2010.03.042>
- Wolfe, M. B. W., & Mienko, J. A. (2007). Learning and memory of factual content from narrative and expository text. *British Journal of Educational Psychology*, 77(3), 541–564. <https://doi.org/10.1348/000709906X143902>
- Wolfe, T. (1975). The new journalism. In T. Wolfe & E. W. Johnson (Eds.) (pp. 13–68). London: Picador.
- Wylie, G. R., Foxe, J. J., & Taylor, T. L. (2008). Forgetting as an Active Process: An fMRI Investigation of Item-Method-Directed Forgetting. *Cerebral Cortex*, 18(3), 670–682. <https://doi.org/10.1093/cercor/bhm101>
- Yang, B., & Marsh, E. J. (2016). Investigating the Phenomenology and Function of Personal and Fictional Memories. Presented at the Psychonomics, Boston, MA. Retrieved from <https://osf.io/ta7w6/>
- Yeshurun, Y., Swanson, S., Simony, E., Chen, J., Lazaridi, C., Honey, C. J., & Hasson, U. (2017). Same Story, Different Story: The Neural Representation of Interpretive Frameworks. *Psychological Science*, 28(3), 307–319. <https://doi.org/10.1177/0956797616682029>
- Zwaan, R. A. (1994). Effect of genre expectations on text comprehension. *Journal of Experimental Psychology: Learning, Memory, and Cognition*, 20(4), 920.

- Zwaan, R. A., Langston, M. C., & Graesser, A. C. (1995). The Construction of Situation Models in Narrative Comprehension: An Event-Indexing Model. *Psychological Science*, 6(5), 292–297.
- Zwaan, R. A., & Radvansky, G. A. (1998). Situation models in language comprehension and memory. *Psychological Bulletin*, 123(2), 162.
- Zwaan, R. A., & van Oostendorp, H. (1993). Do readers construct spatial representations in naturalistic story comprehension? *Discourse Processes*, 16, 125–143.
- <https://doi.org/10.1080/01638539309544832>