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## Stories and Their Role in Social Cognition

**Abstract:** Fiction – when it is listened to, or when it appears in print, film, and video games – introduces people not only to storyworlds, but also to characters, their relationships, and complex social interactions. A growing body of research suggests that people who listen to, read, or watch fiction may learn social skills from stories through various mechanisms, including identifying with and forming parasocial relationships with characters, and simulating the social experiences depicted in the story. This chapter begins by reviewing theories that explain the potential effects of engaging with fiction and the possible mechanisms through which these effects might manifest. We then describe the methods used to investigate the effects of fiction and present a brief overview of both correlational and experimental findings. This overview indicates that there is robust evidence of an association between lifetime exposure to fiction and social cognition, but results from experimental studies have been mixed. Finally, we identify the most important gaps in the current research and propose directions for future research. Despite recent efforts to test the effects of manipulating engagement with fiction on a limited range of social cognitive abilities, many aspects of social cognition have yet to be explored, and there is a clear need for longitudinal intervention studies.

### Introduction

Humans love stories: fairytales, poetry, plays, novels, newspapers, radio, movies, television, and video games. One type of story is based on events that happened, reported in the news and in history books. A second type of story is fiction. Engaging with both types involves imagining ourselves into circumstances other than our own. This means imagining what has happened, what could happen, and how the world could be different (e. g., in fantasy, science fiction, and alternate histories). This chapter explores the possibility that these excursions into imagination during narrative engagement influence our ability to understand others.

## Cross-medium Effects

The earliest evidence of stories comes from graves that date back some 92,000 years (Bar-Yosef Mayer et al., 2009). From these we can infer that, at funerals, people *listened* to stories told about the people who had died. *Reading* stories is far more recent. The number of people who could read increased with the invention of printing and, following that, with the coming of widespread literacy. When paper became cheap in the nineteenth century, newspapers and books became common, and reading increased, too. However, in Europe and North America, with the coming of television, other visual media, and digital devices, rates of reading have diminished, especially of newspapers but also of books. In the Netherlands, for example, the number of people who engaged in leisure reading at least 15 minutes per week fell from 49% in 1975 to 31% in 2000 (Knulst & van den Broek, 2003). Similarly, in the United States, the number of people who said they read novels or short stories declined from 45.1% in 2002 to 41.8% in 2017 (National Endowment for the Arts, 2018). On the other hand, people in the United States now spend more than 10 hours every day connected to non-print media (Nielsen Total Audience Report, 2018), much of which enables audiovisual narrative engagement.

Although people increasingly engage with audiovisual rather than with textual stories, there is no good evidence that the type of medium – listening, reading, watching – has a substantial effect on how stories affect social cognition. For that reason, while much of the empirical work discussed in this chapter is based on reading, our objective is to evaluate whether engaging narrative fiction, regardless of medium, influences the processes people employ to understand and interact with others.

## Empathy and Understanding Others

Our main focus is on processes known as theory-of-mind (often called “mind-reading”), or the ability to understand the intentions, thoughts, and emotions of other people. It also includes empathy, broadly understood as both sharing the emotions of others as well as being able to see things from their perspective (Davis, 1980; Oatley, 2016). There is evidence that engagement with stories is associated with better understanding of others, together with more empathy for them.

The idea that stories can aid one’s understanding of real-world peers has a long history. Thinkers from around the world, in varied cultural contexts, have

observed that narratives might have the power to foster empathy and social understanding. In *Poetics*, for example, Aristotle (330BCE/1970) wrote that: “Plot is the basic principle, the heart and soul, as it were, of tragedy...it is the imitation [*mimesis*] of an action and imitates the persons primarily for the sake of their actions” (p. 28). This last phrase can be understood as referring to “actions in the social world.” In the West, *mimesis* became the central concept for understanding fictional literature – stories – more generally (Halliwell, 2002). For Aristotle, such literature is of “the kind of thing that *can* happen...what kind of person is likely to do or say certain things” (p. 33). In the poetics of the East, a comparable concept is *dhvani* (suggestion), an idea that also dates back more than 2000 years, but is perhaps best approached by way of the *Locana* of Abhinavagupta, written 1000 years ago (Ingalls et al., 1990). On this view, an author offers suggestions so that the reader is invited to imagine social actions and their implications.

Based on these ancient literary concepts (e. g., *mimesis*, *dhvani*), one might think that research into literature and research on human psychology would be close partners. But historically this has not been the case. Not until the work of Bruner (1986), did a rapprochement begin between psychology and literature. Bruner calls the way in which we think about how things work in the physical world “paradigmatic” (p. 12). He contrasts this with a mode that he calls “narrative” (p. 13), by which we think about and come to understand others and ourselves in our social interactions. It is in this mode that stories are written and understood. As Bruner says: “Narrative deals with the vicissitudes of human intentions” (p. 16). He might well have said “human *social* intentions.”

These early theoretical proposals provide background to recent empirical studies of the effects of reading on, for example, moral judgment. Hakemulder (2000) reported that people who read an excerpt from a novel, a story about a Muslim woman’s experience of relationships between men and women in Algeria, exhibited reduced bias in their perceptions of Arab and Caucasian faces. Similarly, Vezzali et al. (2014) found that fiction can affect attitudes towards marginalized groups in the immediate aftermath of fiction exposure, at least to the extent that readers identify with story characters. Recent correlational research reported positive associations between exposure to young adult as well as adult fiction and morally relevant constructs such as moral agency, integrity, and a strong sense of moral self (Black & Barnes, 2020). In parallel historical research, Hunt (2007) found that an important contributor to the invention of human social rights was reading fictional stories: novels about people whose circumstances were different from those of their readers. An oft-cited example is the influence of Harriet Beecher Stowe’s *Uncle Tom’s Cabin* on the abolitionist movement in the United States (Goldner, 2001). The preceding empirical and

historical studies reinforce the possibility that reading fiction affects moral judgment. Although changes in moral judgment may be *mediated* by empathy and understanding, the present review will not consider social cognition in this broader sense. Instead the focus will specifically be on evidence that narrative fiction influences empathy and understanding; empathy and understanding may also mediate changes in attitudes, socio-political convictions, etc., but that will not be our concern here (see Appel et al., this volume). For our more specific topic, the present chapter reviews the major theories, provides an overview of the methods and major results, and serves as a signpost for future research.

## Major Theories

Within the modern era, formal theories proposing that stories might aid empathy and social understanding have emerged across a variety of disciplines, throughout the social sciences. For example, Nussbaum (1995) proposed that literature affords the reader with an opportunity to empathize with others less fortunate than ourselves, enabling the development of moral reasoning. This parallels an even earlier proposal by Vitz (1990), who argued that stories provide a unique tool for those interested in moral education. And yet, as Hagemulder (2000) argued, all these theorists propose that stories, more fundamentally, provide an opportunity to engage in empathy, with empathy defined as “feeling into” the experiences of other people (from the German word, “*Einfühlung*” (Wispe, 1987); for a brief historical overview, see Jacobs & Lüdtke (2017)).

Bandura’s (1986) social learning theory is one approach that begins to explain how narratives affect social cognition. According to Bandura, characters in mediated stories serve as models of social behavior. Recipients of stories can learn vicariously from the actions of these characters and their consequences in the story world, similar to the way people learn from observing others’ behaviors and their consequences in the real world. An interesting corollary of this view is that stories can influence social-cognitive abilities in either a positive or negative way. Reading a story with a protagonist who displays prosocial attitudes and behavior might increase readers’ prosociality. In contrast, reading stories with protagonists who display aggression or violence might have adverse effects. According to Bandura (1986), the key mechanism is vicarious reinforcement: story characters’ moral standards are more likely to be adopted by readers if the characters are rewarded for following these standards in the story world. For example, in one study, 3- to 7-year-old children behaved more honestly after listening to a story that emphasized the positive consequences of tell-

ing the truth, relative to other stories about truth-telling that did not emphasize consequences (Lee et al., 2014).

To elaborate the mechanisms by which covert rehearsal of story structure and content may improve social cognition, Mar (2018a) proposed the Social Processes and Content entrained by Narrative framework (SPaCeN). This framework organizes past empirical research on this topic and proposes two ways in which narrative may exert a causal influence on various social cognitive abilities, including mental inference and social memory. It identifies the theoretical elements that currently enjoy strong empirical support, and those ideas that require more research attention. The first of these two pathways, the Social Processes account, deals with the engagement of social cognitive processes during story comprehension. The second, the Social Content account, concerns the presentation of social knowledge within stories.

Broadly, the Social Processes account proposes that social cognitive processes are engaged during narrative comprehension, such that frequent exposure to narrative might result in a form of practice for these mental processes (Mar, 2018a). In other words, if we engage in mental inference, for example, while comprehending stories, then frequent exposure to stories might hone our mental inference abilities and make us better able to infer what real-world peers are thinking and feeling. Further, in order for this account to be plausible, the following three tenets must be true: (a) stories must provide representations of the social world, such as people and their relationships; (b) social cognitive processes must be engaged during story comprehension; and (c) these same processes must be amenable to improvement through frequent engagement, akin to a practice effect. If, and only if, all three tenets are true, then frequent engagement with narrative will result in an improvement of the social cognitive processes in question. Unfortunately, only a limited number of processes amenable to such rehearsal have been investigated thus far: primarily mental inference, empathy, and to some degree sympathy (Mar, 2018b; Koopman, 2015a; Koopman & Hakemulder, 2015). Moreover, the bulk of empirical evidence examines the presence of a cognitive benefit, with research on the necessary tenets of this account being far less common and often distributed across various processes (Mar, 2018a).

The second pathway through which stories might aid social abilities involves social content. This Social Content account proposes that the content of stories is rich with information relevant to the social world: accurate social knowledge that can be learned and applied in the real-world (Mar, 2018a). Because stories have as their primary focus humans and human psychology, frequent and prolonged exposure to this content might make us more knowledgeable about other people, how they think, and how they are likely to behave. It is

important to point out that this close connection between stories and our social world is not coincidental; nor is it at all surprising. Humans rely on others to thrive and survive, and so it is no wonder that we are attracted to information about others (Mesoudi et al., 2006). It should be no mystery that our most prevalent and robust form of cultural product is the representation of other people, how they think, how they feel, and how they behave. Like the Social Processes account, the Social Content account relies on three tenets: (a) stories must present social knowledge that is at least somewhat accurate, on the whole; (b) people must be able to learn this content, storing it in long-term memory; and (c) this content must be applied in the real-world. Currently, there is less empirical support for the Social Content account relative to the Social Processes account. However, there is indirect evidence in favor of the second and third tenets from research on other topics, and some preliminary evidence in favor of the first. Moving forward, the SPaCeN framework proposes that examining whether observable outcomes are present for the Social Content approach (i. e., whether more frequent consumers of narrative have greater social knowledge) will be an essential step forward (Mar, 2018a).

In addition to the above, other theorists have proposed that the effects of story on empathy and understanding are subject to various moderators. For example, some have argued that stories will only influence social cognition if they are literary in nature (Kidd & Castano, 2013, 2017). From this perspective, only literary fiction requires the reader to deeply imagine the experiences of others. As another example, it has been proposed that effects might only emerge when those who engage in a story are deeply immersed in circumstances and ideas that concern them personally (Bal & Veltkamp, 2013; Panero et al., 2016). These moderating influences will be mentioned here as necessary, but their implications are not discussed in depth.

## Main Methods and Findings

Correlational Evidence. Most of the evidence supporting the idea that exposure to stories promotes social cognition is correlational in nature. One notable advantage of the correlational approach is that it is an observation of spontaneously-occurring real-world leisure behaviour. The exposure to narrative under study is undertaken by individuals of their own volition, in the real-world. As a result, these correlational studies boast an advantage with respect to ecological validity and potential generalizability over experimental approaches that force participants to read something of the experimenter's choosing, at an assigned time, in a laboratory setting. In addition, the prolonged and frequent exposure

to narrative that is presumably necessary to affect social cognitive abilities is perhaps best measured using correlational examinations of lifetime exposure, rather than brief experimental exposures (Mar, 2018a). That said, one limitation of correlational research is that it cannot confirm causal inferences, and so it cannot be determined whether narrative exposure improves social cognition, or vice versa, or whether an unmeasured third variable accounts for the observed association.

Perhaps the earliest investigation on this topic found that people who had been exposed to more print content demonstrated a better understanding of mental-state verbs (Siddiqui et al., 1998). This study, however, did not distinguish between narrative and non-narrative texts. In a follow-up study, exposure to narrative fiction was found to predict one's ability to infer a person's mental-state based on subtle non-verbal cues (photos of people's eyes; see below); the same was not true for their exposure to non-narrative texts (Mar et al., 2006). Importantly, lifetime exposure to both narrative and non-narrative texts was measured in all participants, and as the two are highly correlated, their shared variance was partialled out. This has proven to be a robust finding, with a recent meta-analysis of 14 similar studies on mental inference estimating an average effect size of  $r = .21$ , 95% CI [.15, .27] (Mumper & Gerrig, 2017). Given that this meta-analysis did not include at least one study based on a large sample that found a much larger effect size ( $r(790) = .47$ ; Panero et al., 2016), the association may be even stronger. What is more, the instrument used to assess social cognition in these studies, the Reading-the-Mind-in-the-Eyes Test (RMET; Baron-Cohen et al., 2001) is an easy test for neurotypical populations, failing to discriminate well between similar levels of ability and subject to ceiling effects (Black, 2018). This is another reason why the real-world effect might be underestimated in these studies.

Because it has been by far the most common measure used to assess the effects of reading in experimental as well as correlational studies, it is important to describe the RMET. Developed to identify people with autism spectrum disorders, the RMET presents 36 pictures of eyes and the area immediately surrounding them. Participants are asked to identify the emotion or feeling expressed in the picture by choosing the best word to describe it out of four possible options. This is, therefore, a performance measure rather than one of self-report, which is its primary strength. It has been used to operationalize various aspects of social cognition, including theory-of-mind, mindreading, interpersonal sensitivity, and empathy. Here, it is simply referred to as a measure of social cognition, but it is important to note that successfully completing the RMET involves inferring mental states from pictures and choosing the best words to describe them (requiring a decent vocabulary; for an extended discussion see Mar, 2018a). The

test appears to reflect more than social cognitive ability: RMET scores have been shown to relate to greater verbal IQ (Peterson & Miller, 2012; see also Eddy, 2019). More importantly, IRT analysis suggests that the RMET is too easy for use in the general population (it was designed to identify persons with autism spectrum disorders), as it fails to discriminate between people with high levels of social cognition (Black, 2018). However, despite its weaknesses, the RMET has been consistently correlated with reading fiction, and as a performance measure, is presumably not susceptible to socially-desirable responding, unlike self-report measures of empathy.

As an important component of social cognition, empathy has also been the subject of various empirical studies on the effects of reading. Most of these have distinguished between cognitive and affective empathy. It should be noted that empathy can be understood as potentially self- and/or other-oriented and is considered a multifaceted domain of related constructs, frequently including sympathy, personal distress, and emotional contagion as well as cognitive and affective empathic responses (e. g., Batson, 2009; Davis, 1980; Eisenberg, 2000). The tendency of fiction researchers to rely on the cognitive vs. affective distinction most likely reflects both measurement and research focus. The most frequently used measure of empathy is a self-report questionnaire, Davis's (1980) Interpersonal Reactivity Index (IRI). This widely used and tested measure (see also Eddy, 2019) includes subscales for perspective-taking and empathic concern, usually understood to represent cognitive and affective empathy. Because the IRI is well-established and also includes a fantasy subscale that can be used as a measure of narrative engagement (see Johnson, 2012; Mar et al., 2006), it may be particularly attractive to researchers. In fiction research, the use of the IRI's Fantasy subscale to operationalize dispositional narrative engagement distinguishes it from other forms of empathy and emphasizes the focus of the investigations. Literature on the effects of fiction has focused on *other-* rather than self-oriented forms of empathy (see Eisenberg, 2000). Whereas personal distress and emotional contagion are self-oriented, perspective-taking and empathic concern involve perceptions of and interactions with other people. Importantly, there is fMRI evidence from neuroscience that supports the differential functioning of cognitive and affective empathic responding (Healey & Grossman, 2018; Stietz et al., 2019). There is some overlap in neural substrates, and nomenclature varies between research groups (some pit empathy vs. perspective-taking, others affective vs. cognitive), but on the whole neuroscientific studies support the distinction emphasized by researchers investigating fiction.

Interestingly, it may be of little use to separate perspective-taking (cognitive) and empathic concern (affective), at least with the IRI subscales. Mumper and Gerrig's (2017) meta-analysis aggregated the results of 22 studies examining



the association between narrative and empathy, and found small but reliable – and nearly identical – associations between fiction and both empathic concern ( $r = .074$ , 95% CI [.036, .112]) and perspective-taking ( $r = .079$  [.037, .120]). Although Black and Barnes (2020) found differential associations between reading and empathic concern and perspective-taking, depending on the type of reading (young adult vs. adult fiction and nonfiction), it is worth noting that all the correlations were positive and in line with Mumper and Gerrig’s meta-analysis, even controlling for gender and personality in structural equation models. Overall, research suggests that the association of reading with empathy is weaker than that of reading and mental inference (RMET scores). However, it is worth underscoring that the primary measures in these studies of empathy are self-report trait questionnaires. In contrast, the studies on mental inference employ the RMET, a task-based measure of current ability. Performance-based measures of empathy are needed to give a fuller picture of its relation to reading narratives.

Correlational evidence of an association between narrative exposure and social cognitive ability has also been observed in the context of child development. Developing an understanding that others have mental states, and that these mental states may differ from one’s own, is known as possessing a theory-of-mind (Astington et al., 1988). This key sociodevelopmental landmark typically occurs between the ages of 4 and 6 years. Naturally, there are individual differences in how quickly children progress with socioemotional development, and if stories indeed aid in fostering social cognitive abilities, then it may be expected that childhood exposure to stories will predict theory-of-mind ability. This does appear to be the case. Canadian parents who recognize more children’s storybook authors had children with better theory-of-mind ability, controlling for the child’s age, gender, verbal ability, and parental socioeconomic status (Mar et al., 2010). Perhaps most importantly, the ability of parents to recognize authors of adult fiction showed no such association, indicating that this is not merely an effect of parental memory abilities or even parental exposure to narrative. This association appears to be rather robust, replicating in at least two additional cultures. In Spain, for example, parents who reported that their child read more storybooks had children who performed better on a theory-of-mind task (Adrian et al., 2005). And in Israel, mothers whose storybook choices better reflected those of experts had children who were rated as more empathic and more advanced in their socioemotional development by their teachers (Aram, & Aviram, 2009).

Because correlational research cannot support causal inferences, it is important to consider the potential role of third variables. Many of the studies mentioned above have included several control variables in their analyses, in-

cluding demographic variables such as age and gender, traits like Openness to Experience or a disposition towards narrative transportation, and constructs related to intelligence, such as experience with English and general intelligence (g). However, statistically controlling for third variables in an effective way can be difficult, as a result of measurement error (Westfall & Yarkoni, 2016). What is more, meta-analytic studies suggest that the effects are very small, especially for empathy (e.g., Mumfer & Gerrig, 2017). Without further experimental evidence, it is difficult to claim that any effect of reading on empathy could result in meaningful changes in behavior.

Evidence from Neuroscience. In addition to the correlational studies of behavior mentioned above, evidence of a relation between stories and social cognition also exists within the neuroscience literature. For example, stories and social cognition utilize an overlapping network of neural regions. Both activities recruit a network of regions known as the “default network” (Ferstl et al., 2008; Mar, 2004, 2011). The default network comprises the medial prefrontal cortex, posterior cingulate cortex, posterior superior temporal sulcus, temporal parietal junction, anterior medial temporal gyrus, and medial temporal lobes (Buckner & Carroll, 2007; Raichle et al., 2001; Schacter & Addis, 2007; Spreng et al., 2009). This brain network is recruited when people imagine, or simulate, events outside of their local experience. Mental simulations allow our minds to travel far and wide; they take us into the past or future, to far-off worlds or hypothetical events, or even into the mind of another person (Addis et al., 2007; Hassabis et al., 2007; Hassabis & Maguire, 2009; Okuda et al., 2003; Szpunar et al., 2007; Tamir & Mitchell, 2011). Stories recruit the default network because they stimulate our minds to engage in two particular forms of simulation: the simulation of people and the simulation of physical places (Mar, 2004, 2011; Mason & Just, 2009; Nijhof & Willems, 2015; Oatley, 2016; Speer et al., 2009).

Decades of social neuroscience research has shown that thinking about people and mental states relies on the dorsomedial prefrontal cortex (dmPFC), anterior temporal poles, and temporal parietal junction, among others (Mitchell, 2008; Mitchell et al., 2002; Molenberghs et al., 2016; Saxe & Wexler, 2005). These regions comprise the dmPFC subnetwork within the default network, and become active while people read fiction (Jacobs & Willems, 2019). Through stories, people gain access to the inner workings of another person’s mind. Stories provide readers with engaging descriptions of characters’ actions, interactions, and mental states. These descriptions serve as the fodder with which our mind conjures, or simulates, the experiences of those characters. We might see the world through the perspective of the character, feeling what that they feel, or considering why they do the things they do. These types of social simulations require people to engage their social cognitive capacities (Andrews-Hanna et

al., 2010; Mars et al., 2012; Spreng & Grady, 2010). The more a story engages people's social cognitive capacities, the more the narrative will recruit the dmPFC subnetwork. Further, the more people read stories in their daily lives, the more these regions respond to narratives (Tamir et al., 2015; Willems & Hartung, 2017).

Stories elicit a second type of simulation: through vivid descriptive language, stories transport readers to far-off places. Stories can stimulate the reader to construct images of physical spaces, bustling scenes, or even new worlds. Neuroscience research on scene construction has shown that this kind of simulation relies on neural regions such as the ventromedial prefrontal cortex, hippocampus, and retrosplenial cortex (Hassabis & Maguire, 2009). These structures comprise the medial temporal lobe subnetwork of the default network. Simulating spaces and scenes need not entail social content; it still transports readers away from their current world and into a fictive one (Hassabis et al., 2014). Future work should examine how the medium of the story (e. g., television vs. books; Black & Barnes, 2015b), or the tendency of the reader to be transported into it (Bal & Veltkamp, 2013), impacts the extent to which a story will elicit simulation and accompanying default network activity.

Special Populations. The central role of social cognition in our attraction to and processing of fictional narratives is supported by research on Autism Spectrum Disorder (ASD). This condition is characterized by restrictive and repetitive behavior, along with deficits in social communication and interaction (American Psychiatric Association, 2013) and associated with deficits in social cognition, in imagination, and in narrative production and comprehension (see Barnes, 2012, for review). With respect to film narratives, for example, individuals with ASD are less likely to visually fixate on the characters, particularly their eyes (Klin et al., 2002). They are also more likely to misunderstand characters' mental states and interactions (Golan et al., 2006), and their accounts of complex film narratives contain a smaller bias for mental states over objects (Barnes et al., 2009).

Evidence also suggests that individuals with ASD may be less drawn to fiction than neurotypical individuals. In a study that offered participants a choice of reading options, individuals with ASD selectively chose the option that was neither fiction nor social in nature (Barnes, 2012). However, research also shows that individuals with ASD sometimes become attached to *specific* stories. For example, many individuals with ASD have a work of fiction as their "special interest" (i. e., the movie *Up*, Campbell & Tincani, 2011; the manga *Yu-Gi-Oh*, Davis et al., 2010). Further, Davidson and Weimer (2018) found that parent-reports indicated that children with ASD were just as likely to have a favorite story that was fiction as neurotypical children.

Although a great deal of research has focused on whether stories can be used as an effective intervention with children with ASD (Sansosti et al., 2004), most of this work focuses on social skills and interaction, rather than social cognition. One exception is a study by Tsunemi et al. (2014), who conducted a preliminary study investigating the effect of fiction on social perspective-taking. Children with ASD were assigned to either an experimental group, in which parents read a subset of eight narratives to their children each day, or a control group, where there was no intervention. Notably, the treatment in this case was not mere exposure to the stories: parents also asked children questions about the mental states of the characters. After the child answered these questions, parents would then read the child a different version of the same narrative, which provided different information about the characters' emotions; this process was repeated with a third version of the story. After 5–6 days, four of the nine children in the Experimental group showed improvement, whereas only one of the seven participants in the Control group did.

Experimental Studies. In addition to correlational studies and interventions with special populations, there have also been experimental investigations into whether stories improve social cognition. The majority of these experiments test the degree to which one-time exposure to different genres affects social cognition immediately after exposure, although some exceptions have included delayed post-tests (e. g., Appelet et al., 2016; Bal & Veltkamp, 2013). In addition, most of these experiments have focused on social cognition, primarily using the RMET (see Dodell & Tamir, 2018, for a meta-analytic overview), although some have examined the effect of stories on self-report measures of empathy (e. g., Bal & Veltkamp, 2013; Djikic et al., 2013) or prosocial behavior (Johnson et al., 2013; Koopman, 2015b). Overall, the results have been inconsistent.

In most of these experiments, the effects of one or more genres of fiction are compared to nonfiction and/or to a non-exposure control condition. It is important to note that the term “genre,” which generally means “category,” has several levels. At the broadest level, genre refers to fiction (prose, poetry, drama) and nonfiction, with most published studies testing for differences between fiction and nonfiction in print (Dodell & Tamir, 2018; cf. Black & Barnes, 2015b; Jones & Paris, 2018). However, genre can also refer to different categories of fiction, such as literary versus popular fiction or science fiction, etc. Because literary fiction is often thought to be a particularly strong candidate for improving social cognition, many studies have contrasted it with popular fiction either as a whole, (e. g., Kidd & Castano, 2013; Panero et al., 2016) or with specific genres within popular fiction (Pino & Mazza, 2016).

It is unsurprising that the RMET has been the most frequently used outcome variable in these experiments, given its reliable correlation with lifetime expo-

sure to fiction. However, this reliable association between reading and the RMET found in the correlational literature has not emerged in the experimental evidence. An initial study reported higher scores on the RMET after reading literary fiction, compared with nonfiction, popular fiction, and a non-reading control group (Kidd & Castano, 2013). However, large-scale replication attempts failed to find consistent effects (Panero et al., 2019; Samur et al., 2017; but see van Kuijk et al., 2018). Conceptual replications have fared better: in a within-subjects study, participants scored higher on the RMET after reading fiction than after reading expository nonfiction, controlling for narrative engagement (Black & Barnes, 2015a). A similar replication using television shows in two studies found that participants who had watched award-winning dramas scored higher on the RMET than those who had watched documentaries (Black & Barnes, 2015b). However, in a meta-analysis of the effects of written fiction, Dodel-Feder and Tamir (2018) did not find an effect of reading fiction on RMET scores (vs. nonfiction and non-reading control). What they did discover was a small effect of reading fiction on social cognition as a whole, including other outcome variables such as self-reported empathy. In fact, the largest effect size among the studies included in the meta-analysis was obtained with a self-report scale: the perspective-taking subscale of Davis's (1980) Interpersonal Reactivity Index (IRI) (Johnson et al., 2013).

The most commonly used measure of empathy, Davis's (1980) IRI has been used in various experiments designed to test the effect of reading on empathy, but results have been inconsistent. Researchers have used both the perspective-taking subscale and the empathic concern subscale. One study found a positive effect on self-reported perspective-taking after reading narrative fiction (Johnson et al., 2013). However, another study found no effect for perspective-taking or empathic concern (Djikic et al., 2013). Interestingly, Bal and Veltkamp (2013) did find an effect on empathic concern: participants who had read fiction and were highly engaged with the narrative scored higher in empathic concern at one week compared with those who had read nonfiction. These mixed results from experiments using self-report echo the conflicting results from experiments relying on the RMET.

## Future Directions and Concluding Remarks

Given the strong correlational evidence and theoretical reasons to support an effect of stories on social cognition, the conflicting results from experimental designs suggest a need to consider mechanism. It may be useful to examine

possible moderators, with narrative engagement being a demonstrated moderator in some studies (e. g., Bal & Veltkamp, 2013; Richter et al., 2014; but see Appel et al., 2016). Narrative engagement depends on pre-existing factors that participants bring to the experiment, such as need for affect (Appel & Richter, 2010). Other factors, such as identification with fictional characters – which in turn may depend upon perceived similarity and liking – can also determine narrative engagement (Hoorn & Konijn, 2003) and any subsequent learning based on modelling (Bandura, 2001). Taking these potential moderators and mediators into consideration is essential for future research on this topic, but it will require complex statistical models and large sample sizes (Westfall & Yarkoni, 2016).

Longitudinal studies are also much needed, both to test for the durability of immediate effects, and to simulate more closely real-life reading experiences. Importantly, longitudinal studies would allow researchers to move beyond mechanism and focus on prediction as the ultimate test of proposed explanatory models (see Yarkoni & Westfall, 2017). Saying that “reading fiction is good for you” does not mean that your capacity for an empathic response will increase after reading one short story (that you did not choose). Rather, it does mean that a habit of reading books, reflecting on their meaning, and applying it to yourself and your relationships will enrich your life. This enrichment may come in the form of greater understanding of other people, increased empathy, specific historical knowledge, or better understanding of current social environments (Mar, 2018). These diverse outcomes cannot be captured by a single measure of how accurately people can correctly identify mental states – with the help of multiple-choice answer formats – based on small black and white photographs.

Further, the probability of finding an effect is dependent on measurement reliability, and most of the measures used in the extant research suffer from weaknesses such as poor measurement (Black, 2018), potential social-desirability biases, and dubious construct validity. For example, what does the RMET really measure? Theory-of-mind (Black & Barnes, 2015a, 2015b), interpersonal sensitivity (Fong et al., 2013), or reading ability (Panero et al., 2016)? There is a need for alternative measures of social cognition to extend this research, which has relied too heavily on the RMET. Social cognition is not only about understanding others; it is also about understanding and expressing one’s own emotions and desires. Given the findings related to theory of mind and empathy, a compelling direction for future research would be testing the association of fiction with emotional intelligence, which comprises the ability to detect, discriminate, and interpret emotions in the self and others, and to use this knowledge to operate successfully in social situations (Brackett & Salovey, 2006).

Future work could also directly examine content-based outcomes by examining if learning social knowledge can be assessed with content tests. Prior research suggests that fiction may be a particularly useful learning tool when it comes to learning about abnormal psychology and neuroatypical minds, which indicates that this may be a promising avenue for measuring outcomes (Stern & Barnes, 2019). Behavioral measures to assess altruism or cooperation would also be of interest, particularly for experimental designs. Interestingly, little research has been done to investigate the association of reading with moral traits and behavior (cf. Black et al., 2017; Johnson et al., 2013), even though morality is certainly related to social cognition. An important first step would be cross-sectional investigations of the association between lifetime exposure to stories – both in print and film – and morally-relevant constructs.

In short, although there has been a great deal of recent research on the association of stories and social cognition, much remains to be done. Given the quantity of hours people spend immersed in narratives and the importance placed on reading by educational systems, identifying mechanisms and testing for effects of different types of media and genres on a variety of outcome variables should be of interest to policy makers and the publishing industry as well as to academic researchers. Fortunately, there are many fascinating avenues for future research.

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