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Different Stories: How Levels of Familiarity With Literary and Genre Fiction Relate to Mentalizing

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Our ability to infer and understand others' thoughts and feelings, known as theory of mind (ToM), has important consequences across the life span, supporting empathy, pro-social behavior, and coordination in groups. Socialization practices and interpersonal interactions help develop this capacity, and so does engaging with fiction. Research suggests that lifetime exposure to fiction predicts performance on ToM tests, but little evidence speaks to the type of fiction most responsible for this effect. We draw from literary theory and empirical work to propose that literary fiction is more likely than genre fiction to foster ToM, describe the development of a new method for assessing exposure to literary and popular genre fiction, and report findings from 3 samples testing the specificity of the relation between exposure to literary fiction and ToM. Results indicate that exposure to literary but not genre fiction positively predicts performance on a test of ToM, even when accounting for demographic variables including age, gender, educational attainment, undergraduate major (in 2 samples), and self-reported empathy (in 1 sample). These findings offer further evidence that habitual engagement with others' minds, even fictional ones, may improve the psychological processes supporting intersubjectivity. We discuss their implications for understanding the impacts of fiction, and for models of culture more generally.

Keywords: culture and cognition, fiction, individual differences, person perception, theory of mind

The ability to engage with others on the basis of their subjective experiences is critical to living a normal social life. A growing literature emphasizes the importance of constructs such as empathy, concern for the thoughts and feelings of others (de Waal, 2008); and emotional intelligence, the ability to effectively integrate understanding of one's own and others' emotions into decision-making (Mayer, Roberts, & Barsade, 2008). At the core of this capacity for intersubjectivity is theory of mind (ToM), the ability to represent the mental states of others (Heyes & Frith, 2014). In much research, ToM is assessed by administering the Reading the Mind in the Eyes Test (RMET; Baron-Cohen, Wheelwright, Hill, Raste, & Plumb, 2001), which asks participants to select which of four emotion terms most closely matches the expression of a person in a photograph. Studies using this measure indicate that deficits in ToM are associated with pathologies including autism and schizophrenia (Baron-Cohen, Leslie, & Frith, 1985; Brüne, 2005), just as better performance on tests of ToM relates to more prosocial (Declerck & Bogaert, 2008) and effective

social interactions (Engel, Woolley, Jing, Chabris, & Malone, 2014; Woolley, Chabris, Pentland, Hashmi, & Malone, 2010).

Given the importance of ToM, researchers have begun to examine potential sources of variation in this capacity. For instance, individuals who are asked to think of themselves as having high socioeconomic status (SES) perform worse on an advanced test of ToM than those given low SES instructions, apparently because the high status manipulation reduced their perceived need to attend to others (Kraus, Côté, & Keltner, 2010). In contrast, a compassion meditation training program, intended to promote more careful attention to others' experiences, led to better performance on the same ToM test compared to a control discussion group (Mascaro, Rilling, Negi, & Raison, 2013). These studies suggest that ToM is not just a developmental achievement, but also a capacity that is modulated by situations or activities that direct attention to others' mental states. Engagement with fictional narratives is one such activity.

Research has revealed that familiarity with fiction authors, a good proxy measure of actual reading habits, correlates with scores on a test of ToM (Mar et al., 2006), and that this relation is not explained by individual differences in agreeableness or a dispositional tendency to imagine oneself in fictional worlds (Mar, Oatley, & Peterson, 2009). As Mar and Oatley (2008) argue, fiction supports rich simulations of social worlds, providing readers with opportunities to hone the processes underlying social perception (see also Koopman & Hakemulder, 2015). Just as real world interactions do not reliably require intensive reliance on ToM (Hirschfeld, 2006), however, different types of fiction also appear

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to make varying demands on ToM processes, with literary fiction being most likely to strongly evoke ToM (Kidd & Castano, 2013).

The importance of distinguishing between literary and genre fiction is highlighted by scholarship that draws from both literary studies and psychological theory. Genre fiction is defined primarily by its focus on a particular topic and reliance on relatively formulaic plots. By contrast, literary fiction is defined more by its aesthetic qualities and character development than its focus on plot or a particular set of topics and themes. This distinction is recognized by publishers, who routinely list it as a publishing category; and by critics, who award separate prizes for specific genres (e.g., the Hugo awards for fantasy and the Nebula awards for science fiction), as well as prizes for general literary quality (e.g., the PEN/O. Henry Prize and the National Book Award for fiction). The distinction has also been put in terms of what attracts readers to the work: entertainment and escape for genre fiction, understanding and engagement for literary fiction (Petite, 2014). Empirical research appears to bear this out. A study of adult readers found that readers of primarily literary, romance, or mystery fiction value different features. Readers of literary fiction, compared to the others, indicated greater appreciation for figurative language (e.g., metaphor), multiple plot lines, many possible meanings, opportunities for imaginative interpretation, several shifting perspectives, and character development (Miesen, 2004). Although there are certainly exceptions and ambiguous cases, industry, critics, and ordinary readers appear to agree that literary fiction generally affords greater opportunities for interpretive engagement than more formulaic genres.

This view resonates with extant theory and research. The cognitive literary theorist David Herman (1997) proposes that all fiction makes use of psychological schemas and scripts, with variation in usage “correspond[ing] to generic classifications” (p. 1054). However, he notes that the “processing of narratives is more complex when they inhibit what might be termed the naïve application of scripts and promote instead reflection on the limits of applicability of the scripts being invoked” (p. 1054). That is, part of what differentiates literary and genre fiction may be their relative degrees of uncritical reliance on widely shared scripts, schemas, and stereotypes. Consistent with this view, a study of TV viewing habits found that watching formulaic genre dramas was positively associated with conventional thinking (Appel, 2008). Other scholars have argued that many, perhaps most, works of fiction tend to present clear protagonists and antagonists who display fixed traits associated with their agonistic role (Carroll, Gottschall, Johnson, & Kruger, 2012). Easily understood and predictable characters are thought to bolster readers’ social confidence (Gerrig & Rapp, 2004), and contribute to an existentially reassuring experience of stability and order (Nell, 2002).

Yet, research also suggests that some fiction, particularly literary fiction, may support a different range of experiences and psychological effects. Drawing from the formalist concept of defamiliarization, Miall and Kuiken (1994, 1999) propose that literary qualities tend to disrupt routine or rigid modes of thinking. Experimental work supports this and Herman’s (1997) argument, with participants assigned to read literary fiction reporting reduced need for order and greater tolerance for ambiguity than those assigned to read nonfiction (Djikic, Oatley, & Moldoveanu, 2013). When it comes to characterization, literary fiction tends to flout polarized agonistic structures or discrete personalities, developing

instead complex characters (Hakemulder, 2000). Suzanne Keen (2011), while criticizing the high/low evaluative distinction between literary and popular genre fiction, recognizes that the two forms differ in terms of characterization, with “sketchy and stereotyped characters engaged in predictable actions typifying despised lowbrow genres and complicated, changeable, and category-resistant characters populating serious literary fiction” (p. 303). Eder, Jannidis, and Schneider (2010) likewise observe that despite a longstanding critical preference for complex characters, popular formulaic genres across media continue to place stock characters in central roles.

These depictions of characterization in literary and popular fiction align with a distinction made by the writer and critic E. M. Forster (1927/2002) between *round* and *flat* characters. In Forster’s (1927/2002) view, flat characters are simple and predictable, whereas round characters are more psychologically interesting and thus greater artistic achievements. However, Keen (2011) notes that simple characters sometimes evoke strong feelings of empathy precisely because their struggles and triumphs are unclouded by ambiguity. Therefore, although flat and round characters may each effectively attract readers, multidimensional, round characters are more reliable sources of the interpretive richness that is favored by contemporary critics and readers of literary fiction (Miesen, 2004).

To understand how each type of character engages readers, Culpeper (2001) discusses flat and round characters in terms of category-based and person-based perception, respectively. Flat characters are easily recognized and represented in terms of a single role or idea; they are types and caricatures. Along with Culpeper (2001), we propose that the rapid identification and elaboration of flat characters draws on readers’ extensive familiarity with schemas associated with different social identities and roles, as well as with particular stock characters associated with specific genres. Hirschfeld (2006) labels this capacity to navigate the social world on the basis of schematic information, *Theory of Society*, and observes that it is often a more rapid, efficient, and (sometimes) accurate means to understanding others than ToM. That is, just as in the real world, readers may effectively make sense of fictional worlds by applying prior schematic knowledge. This strategy seems especially likely when those fictional worlds are constructed using established formulas and populated with fairly stock characters.

In contrast, Culpeper (2001) argues that round characters are less likely to be understood as types, instead prompting person-based, or individuated, perception. Unlike impressions based on applications of schemas, those formed via individuation involve regular updates and adjustments as new information is acquired about the individual’s particular beliefs, feelings, and intentions (Swencionis & Fiske, 2014). Round characters cannot be readily understood in terms of a particular schema, and thus readers must consistently attend to cues to their mental states. Moreover, in literary fiction, these cues are often subtle (Zunshine, 2015), adding to the reader’s inferential task. Thus, literary fiction, with its generally less easily understood characters (Hakemulder, 2000; Keen, 2011), is more likely than popular genre fiction to extensively recruit bottom-up, person-based sociocognitive processes.

Consistent with this view, recent experimental work shows that it is engaging with literary fiction specifically that enhances performance on ToM tests; engagement with genre fiction does not (Kidd & Castano, 2013). These findings raise the possibility that

the positive correlation between familiarity with fiction and ToM that has been repeatedly observed (e.g., Mar et al., 2006, 2009) could in fact be primarily attributable to familiarity with *literary* fiction. In one study in which participants completed an ART with subscales for different genres (i.e., domestic, romance, science-fiction/fantasy, and suspense), only familiarity with romance fiction positively predicted ToM performance (Fong, Mullin, & Mar, 2013). However, no measure of exposure to specifically literary fiction was included, making it impossible to assess the relative contributions of literary and genre fiction to ToM.

Two studies were conducted to assess whether it is familiarity with literary fiction specifically that predicts performance on a test of advanced ToM, or whether familiarity with genre fiction is just as important a predictor. Despite the theoretical differences between literary and genre fiction, it is unclear whether this distinction is consistently reflected in ordinary readers' patterns of exposure to fiction. To address this question, we first conducted a factor analysis of a well-validated ART (Acheson, Wells, & MacDonald, 2008) in two separate samples. Utilizing factor analysis is important for theoretical and methodological reasons. In terms of theory, identifying literary and genre factors would suggest that ordinary readers (or at least their sources of reading recommendations) are sensitive to the distinction between literary and genre fiction. From a methodological perspective, factor analysis is important to establish that recognition rates of literary and genre authors are empirically distinguishable, and that they correspond to separate underlying constructs. In addition, adopting this data-driven approach to classifying authors as literary or genre is more methodologically objective than more subjective methods. After identifying factors corresponding to literary and genre fiction, scores based on recognition rates of authors loading onto these factors were used to test the relations of familiarity with each type of fiction with ToM performance in three samples.

Study 1

Method

Participants and procedures.

Sample 1. Participants ($N = 1,260$) in the first sample were recruited via an embedded link in a *New York Times* article (Belluck, 2013) about research on reading fiction and interpersonal sensitivity. We aimed to secure between 15 and 20 cases for each of the 65 critical items of the instrument measuring familiarity with fiction, the Author Recognition Test (ART), to ensure reliability of the factor analytical procedure, and we stopped data collection once the response rate exceeded 1,200. Participants who failed to select at least one author on the ART or selected more foils than authors ($n = 13$) were removed, along with those who did not provide demographic information ($n = 4$). All remaining participants performed above chance on the RMET. Upon clicking the embedded link, potential participants were directed to a Qualtrics survey where, upon providing informed consent, they completed a test of ToM, the ART, and a series of demographic questions including their gender, age, level of education, college major, and race/ethnicity.¹ Level of education was assessed by asking participants to indicate their highest attained degree using the following options: some high school, high school graduate, some college, college graduate, or graduate degree. To simplify

analyses, level of education was recoded into categories for those without a college degree and those with a college degree. Participants also indicated their undergraduate major by selecting one of the following options: business, humanities, natural sciences, social sciences, or other. Upon completing the survey, participants were thanked and shown their score on the ToM test.

Sample 2. Participants ($N = 896$) in the second sample were recruited online using Amazon.com's Mechanical Turk service and were then directed to online studies hosted by Qualtrics.com after providing informed consent. These were paid participants in one of six experiments (four of which are reported in Kidd & Castano, 2013) that included a common measure of ToM and the measure of familiarity with fiction. In these experiments, some participants were randomly assigned to read literary fiction ($n = 340$) and others were assigned to read nonfiction ($n = 42$), popular genre fiction ($n = 275$), or nothing at all ($n = 239$) before completing the test of ToM and familiarity measure. The overall size of the second sample was based on convenience and power considerations specific to the experiments from which the data was obtained. The exclusion criteria for this sample are described in Kidd and Castano (2013), and those for the experiments not reported there are the same as in that report's fifth experiment.

Characteristics of both samples are presented in Table 1.

Measures.

Theory of mind. Theory of mind was assessed using the Reading the Mind in the Eyes Test (RMET; Baron-Cohen et al., 2001). Designed and validated as a measure of advanced ToM, the RMET includes 36 trials in which black and white images of only the eye regions of the faces of actors are shown. Participants respond by selecting which of four complex emotion terms (e.g., contemplative, cautious, concerned, irritated) best matches the emotion expressed in each image. Unlike many tests of ToM, which have largely been designed for use with children or people with social difficulties, the RMET is sufficiently difficult to reveal variability among ordinary adult participants (Baron-Cohen et al., 2001; Vellante et al., 2013). The RMET is also distinct from more simple tests of emotion perception because the mental states depicted are complex, often blending affective and cognitive features (e.g., contemplative), and thus require advanced ToM in order to be understood (Mitchell & Phillips, 2015; Singer, 2006).

Familiarity with fiction. The Author Recognition Test (ART) is a measure of exposure to fiction originally developed by Stanovich and West (1989). Participants are shown an extensive list of names and asked to identify the authors they recognize. The presence of an equal number of nonauthors and authors helps to discourage guessing. Unlike self-reports of reading habits, this form of measurement is less likely to be influenced by a desire to present oneself as a more avid reader than is truly the case, and it has been shown to effectively predict participants' actual engagement with fiction (Rain & Mar, 2014; Stanovich & Cunningham, 1992; Stanovich, West, & Harrison, 1995). Modified versions of the ART have been used to distinguish rates of reading nonfiction and fiction (e.g., Mar et al., 2006, 2009), as well as different genres of fiction (e.g., Fong et al., 2013; Fong, Mullin, & Mar, 2015). Participants in both of the current samples completed an updated

¹ Participants also completed a measure of moral values, but those data are not discussed here.

Table 1
Sample Characteristics, Differences, and Correlations Among Variables for Study 1

	Age*	ART*	ART foils*	Literary ART*	Genre ART*	RMET*	% College graduates*	% Women*	% White
Sample 1 ($N = 1,243$)	44.09 (16.21) [43.19, 44.99]	30.17 (16.20) [29.27, 31.07] $\alpha = .96$	1.37 (2.46) [1.23, 1.50]	.50 (.27) [.49, .52] $\alpha = .95$	.44 (.28) [.42, .46] $\alpha = .91$	26.35 (3.81) [26.13, 26.56] $\alpha = .56$	74.12	71.78	82.56
Sample 2 ($N = 896$)	33.48 (11.45) [32.73, 34.23]	21.64 (13.90) [20.73, 22.55] $\alpha = .96$	.62 (1.49) [.53, .72]	.34 (.23) [.32, .35] $\alpha = .94$	.32 (.23) [.30, .34] $\alpha = .90$	25.58 (4.37) [25.29, 25.86] $\alpha = .73$	50.56	52.34	80.47
Age	—	.48*** [4.4, .52]	.05 [-.00, .10]	.38*** [.33, .42]	.61*** [.57, .64]	-.08** [-.13, -.02]	—	—	—
ART	.36*** [.30, .42]	—	.01 [-.03, .07]	.95*** [.95, .96]	.87*** [.85, .88]	.08** [.03, .14]	—	—	—
ART Foils	.03 [-.02, .10]	.10** [.03, .16]	—	.15*** [.09, .20]	.16*** [.11, .21]	-.00 [-.05, .05]	—	—	—
Literary ART	.23*** [.16, .29]	.96*** [.95, .96]	.19*** [.13, .26]	—	.74*** [.72, .77]	.10*** [.05, .16]	—	—	—
Genre ART	.56*** [.51, .60]	.86*** [.84, .88]	.18*** [.12, .24]	.71*** [.68, .74]	—	.01 [-.03, .07]	—	—	—
RMET	.04 [-.02, .11]	.25 [-.19, .31]	.01 [-.05, .08]	.23*** [.17, .29]	.22*** [.16, .28]	—	—	—	—

Note. ART = Author Recognition Test; RMET = Reading the Mind in the Eyes Test. Literary ART and Genre ART scores are calculated as proportions of authors recognized. Standard deviations for each mean are reported in parentheses. 95% Confidence intervals for each mean are reported in brackets. Correlations for Sample 1 are reported above the diagonal.

* In the top row indicates a difference between the samples significant at $p < .05$. ** Indicates a correlation significant at $p < .01$. *** Indicates a correlation significant at $p < .001$.

version of the ART (Acheson et al., 2008) that includes 130 names, 65 of which are those of authors of fiction. In a recent study, Moore and Gordon (2015) administered the same ART to a large student sample and reported a two-factor solution for the ART responses that roughly matches the distinction between literary and genre fiction, suggesting the appropriateness of this measure for the present study.

Results

Identification of literary and genre categories in the ART.

Sample 1. Because responses on the ART are dichotomous, an iterated principal factors analysis (SAS v.9.2, Proc Factor) was conducted on a tetrachoric correlation matrix (generated using the %polychor macro for SAS [convergence criterion = .0001, maximum iterations = 25]). The number of factors was limited to two, and an oblique transformation was used to account for the expected correlation of the factors.

The Eigenvalues were 35.32 and 4.27 for the first and second factors, respectively. Together, the two factors accounted for 60.92% of the variance. Although other Eigenvalues were greater than 1, only two were retained in order to maximize theoretical interpretability. Following the recommendations outlined by O'Rourke and Hatcher (2013), 32 authors were associated (pattern loadings $> .40$) with the first factor and 23 were associated only with the second factor. Seven authors had loadings greater than the threshold of 0.40 on both factors, and three had loadings of less than 0.40 on both factors (see Table 2). The first factor was composed almost exclusively of authors easily categorized as literary (e.g., Toni Morrison, Vladimir Nabokov), whereas the second factor included mostly authors of popular genre fiction (e.g., Tom Clancy, Danielle Steel).

Sample 2. The same procedure described above was used for the second sample ($N = 896$). The eigenvalue for the first factor was 35.09 and 4.26 for the second, with the factors together explaining 60.55% of the variance. Forty-three authors were associated with the first factor and 18 authors with the second factor. Only one author (Nora Ephron) had a loading greater than 0.40 on both factors, and three authors had loadings of less than 0.40 on both factors (see Table 2). As in the first sample, the first factor represented primarily literary authors, whereas the second factor included mostly genre authors.

Comparison of factor analyses. The factor analyses led to substantially similar results in the two samples. Bivariate correlations of the factor loadings from the two samples revealed that both loadings on the literary factor, $r(63) = .83, p < .001$, and the genre factor, $r(63) = .76, p < .001$, were highly correlated. Moreover, only four (6.15%) authors were associated with different factors in the two samples. In all cases, these authors (Maya Angelou, Ernest Hemingway, E. B. White, and Thomas Wolfe) loaded significantly only on the genre factor in the first sample and only on the literary factor in the second sample.

Factor analysis with combined samples. Given the similarity of these analyses, a final iterated factors analysis was conducted after combining the data from both samples ($N = 2,139$). The eigenvalue for the first factor was 36.15, and the eigenvalue for the second was 3.95. Together, the two factors accounted for 61.72% of the variance. Thirty-nine authors were identified as loading ($> .40$) onto the first factor, and 20 loaded only onto the second

Table 2
Rotated Factor Pattern (Standardized Regression Coefficients)

Author	Literary			Genre			% Selected
	Sample 1	Sample 2	Combined	Sample 1	Sample 2	Combined	Combined
Gabriel Garcia Marquez	1.04108	.86278	1.03802	-.3094	-.045	-.2719	34.39
Vladimir Nabokov	.96056	.93354	.99769	-.1916	-.1356	-.214	38.35
Umberto Eco	.96741	.80742	.94308	-.225	.12802	-.1371	29.02
Kazuo Ishiguro	.87958	.92431	.93895	-.1506	-.2291	-.2151	14.13
Isabel Allende	.87984	.55991	.88519	-.1324	.22885	-.1232	24.17
Samuel Beckett	.82621	.78077	.85365	-.0504	.00598	-.06	39.80
Michael Ondaatje	.8164	.72189	.85272	.02575	.1074	-.0159	12.27
Thomas Pynchon	.7789	.91693	.8523	.16375	-.0084	.07801	25.29
Margaret Atwood	.79022	.78109	.83615	.0518	.04858	.00572	38.54
Virginia Woolf	.73283	.86822	.79068	-.039	-.1409	-.0694	69.71
Ralph Ellison	.68587	.74478	.75488	.07357	.0256	.00487	28.46
Alice Walker	.68171	.62671	.75199	.17668	.15722	.0852	36.63
Toni Morrison	.64914	.75442	.74429	.2761	.1079	.16272	43.58
James Joyce	.65456	.85347	.73521	.24152	.04258	.17141	60.24
Saul Bellow	.65437	.74758	.72995	.33549	.22887	.25284	27.62
Joyce Carol Oates	.65353	.72372	.72602	.31788	.20339	.22946	40.27
Bernard Malamud	.63781	.81442	.702	.25952	.2233	.21614	13.90
George Orwell	.66356	.8292	.68755	.13993	-.1785	.06412	80.82
Ann Beattie	.63523	.47555	.67743	.14296	.16452	.07829	11.43
Raymond Chandler	.64969	.70388	.67481	.23352	.21859	.22356	26.45
John Irving	.628	.55313	.6702	.16487	.20701	.12288	48.39
Paul Theroux	.63161	.51103	.66711	.13468	.15274	.07869	24.73
T. C. Boyle	.62811	.44815	.66599	-.1115	.08709	-.128	20.34
Harper Lee	.55369	.83851	.66398	.24863	-.1978	.08003	55.15
Jane Smiley	.60096	.647	.65375	.32292	.32645	.27566	13.48
F. S. Fitzgerald	.52657	.82115	.64987	.27404	-.1605	.10345	83.06
Salman Rushdie	.5703	.6895	.63249	.32876	.20581	.27689	48.62
Kurt Vonnegut	.51744	.84797	.61283	.42196	.01498	.29425	62.01
William Faulkner	.50129	.69975	.59437	.36959	.1364	.27222	65.84
Willa Cather	.5087	.60223	.59147	.47297	.34526	.38052	28.83
Isaac Asimov	.55299	.67597	.56923	.31297	.13098	.27798	59.58
J. D. Salinger	.43898	.77438	.52534	.4436	.02444	.32011	73.96
Ayn Rand	.42115	.85746	.51685	.49518	-.0659	.33382	61.78
T. S. Eliot	.40272	.77498	.50522	.3029	-.0097	.24015	84.46
Wally Lamb	.43451	.43391	.4988	.41759	.39898	.35242	18.15
Jack London	.46983	.58986	.49372	.37591	.22931	.34179	62.01
Nora Ephron ^a	.41791	.44425	.48903	.50577	.43852	.42495	38.54
J. R. R. Tolkien	.51727	.65036	.47838	.24915	-.1212	.19578	88.10
Thomas Wolfe	.38744	.43124	.46453	.45857	.31715	.3587	43.02
Maya Angelou	.31693	.71394	.46106	.52677	.05937	.35462	65.74
Ray Bradbury ^a	.42879	.63858	.43848	.47032	.13004	.40118	61.78
E. B. White ^b	.26678	.58697	.398	.53034	.06789	.34382	58.56
Ernest Hemingway	.34337	.48488	.35443	.42061	.28447	.42089	88.61
Margaret Mitchell	.28367	.34438	.34239	.58292	.5762	.55295	33.59
Tony Hillerman	.3357	.17358	.342	.61569	.75155	.60498	18.99
Jean M. Auel	.31154	.20389	.31293	.53789	.68404	.5551	17.54
Herman Wouk	.22863	.3145	.29553	.74091	.64477	.68206	24.26
Dick Francis	.3337	-.0736	.26984	.52968	.82677	.55476	17.96
Stephen King ^b	.21384	.45346	.25586	.38103	.07571	.33493	91.88
James Clavell	.17848	.17264	.227	.61487	.69139	.6067	22.95
Anne McCaffrey ^b	.22414	.33623	.21998	.33587	.38763	.39377	20.48
Robert Ludlum	.10754	.34051	.18886	.7557	.54263	.70228	38.77
James Michener	.10763	.12698	.18051	.8169	.80242	.76172	35.83
Brian Herbert ^b	.1684	.35992	.16544	.0515	.20884	.18096	04.01
Sue Grafton	.15722	.18338	.15637	.73379	.68498	.72375	32.57
Jonathan Kellerman	.10688	-.0457	.0842	.73455	.89669	.76704	18.89
John Grisham	.0222	.26695	.07328	.83026	.56548	.77815	74.38
Jackie Collins	-.0716	-.0163	-.0138	.80573	.79542	.77975	45.63
Judith Krantz	-.0353	-.0674	-.0175	.84554	.8607	.83127	37.37
Clive Cussler	-.0174	.14553	-.0244	.76557	.69604	.79972	29.67
Tom Clancy	-.0382	.36129	-.0358	.81911	.26612	.74479	80.77
Nelson DeMille	-.0996	-.064	-.0625	.71929	.81083	.73477	11.75
Sidney Sheldon	-.1303	-.0986	-.066	.80869	.91138	.81484	34.76
Danielle Steel	-.1226	-.013	-.1038	.88554	.76561	.87744	71.95
James Patterson	-.1355	.13095	-.1048	.82102	.46758	.76554	54.50

Note. Factor loadings in bold type are significant based on the .40 or greater criterion.

^a Authors excluded because of loadings greater than .40 on both factors. ^b Authors excluded because of loadings less than .40 on both factors.

factor. Two authors (Nora Ephron and Ray Bradbury) had loadings of greater than 0.40 on both factors, and four authors (Brian Herbert, Stephen King, Anne McCaffrey, and E.B. White) had loadings of less than 0.40 on both factors. As these six (9.23%) authors could not be clearly associated with either factor, they were not included in the factor-based scores. As in the previous analyses, the authors associated with the first factor could mostly be easily categorized as literary while those linked to the second factor could generally be classified as authors of genre fiction (see Table 2). Based on the groups of authors generated by this final factor analysis, recognition scores for literary and genre fiction were created by calculating the proportion of authors participants identified of each type.

As with any factor analysis, the factors must be interpreted. In this case, we propose that the factors can be meaningfully interpreted as reflecting mostly literary and genre writers. There are some notable exceptions. For example, Ernest Hemingway, an acclaimed author and Nobel Prize winner, is included (barely) in the genre factor, and Isaac Asimov, one of the most influential science fiction writers, is included in the literary factor. We do not believe these categorizations necessarily indicate that Hemingway is actually a genre fiction author or that Asimov should not be considered a science fiction writer. However, it is also true that Asimov, and other genre authors included in the literary category (i.e., Raymond Chandler, Jack London, and J. R. R. Tolkien), challenged the formulas of their genres, giving their work literary characteristics according to our theoretical view. Conversely, some acclaimed writers were linked to the genre fiction category: Margaret Mitchell (a National Book Award and Pulitzer Prize winner), Ernest Hemingway (Nobel Prize winner), and Herman Wouk (Pulitzer Prize winner). Both Herman Wouk and, especially, Margaret Mitchell are known not only by readers but also by viewers of popular screen adaptations of their works, perhaps contributing to their inclusion in the original genre category. Moreover, Mitchell's novel, *Gone with the Wind*, follows many of the formulas of romance fiction, and Wouk's prize-winning *The Caine Mutiny* was read by some critics of its day as upholding conventional ideas and values (Swados, 1953). Their inclusion in the genre category is therefore not inconsistent with our theoretical perspective. Thus, despite a few ambiguous categorizations, the factors yielded by the factor analysis generally distinguish between literary and genre fiction. We revisit this matter and others related to characteristics of the two factors in a series of additional analyses discussed after presentation of the primary findings.

Predicting RMET performance. The hypothesis that familiarity with literary fiction is positively associated with performance on the RMET was tested separately in the two samples using similar procedures: Recognition rates for the literary and genre factors were entered as independent variables in a general linear model (GLM; Proc GLM, SAS v9.2) with RMET performance as the dependent variable. The number of foils (i.e., non-authors) selected on the ART was included as a covariate following conventional methods (e.g., Mar et al., 2006). Potentially confounding demographic variables that independently related to both RMET scores and one of the two measures of familiarity with fiction were also included as covariates. Accordingly, age was included as a covariate in analysis of the first sample (See Table 1). In the first sample, there was a significant effect of college major on RMET performance.² Likewise, undergraduate major was a

significant predictor exposure to both literary and genre fiction.³ Consequently, undergraduate major was added as a covariate in the analysis of the first sample. In both samples, female participants performed better than males on the RMET,⁴ and they were more familiar with both literary fiction⁵ and genre fiction.⁶ In the second sample, which was composed of datasets from prior experiments, experimental condition (literary fiction vs. controls) was also included as a covariate.⁷ In the second sample, participants who had attained at least a college degree performed better on the RMET than those who had not.⁸ They also recognized more literary⁹ and genre¹⁰ authors. Consequently, level of education was also added as a covariate.

For each analysis, cases with high leverage were identified using Cook's distance. Those with Cook's distances greater than a conventional criterion ($4/n$) were removed from the analysis (Chen, Ender, Mitchell, & Wells, 2003). This led to exclusion of cases from both analyses (4.26% in the first sample, 3.56% in the second). Given the high correlation of the measures of familiarity with literary and genre fiction, tolerance statistics were checked for each variable to confirm that they were above the conventional threshold of .10. In both samples, no variable had an associated tolerance statistic below .10 (Sample 1: all $>.29$; Sample 2: all $>.44$).

Results from the GLM conducted with the first sample indicated that recognition rates of literary authors positively predicted RMET performance, and age was negatively related to RMET scores (see Table 3). Analysis of the second sample yielded significant effects of familiarity with literary fiction and experimental condition (see Table 4). Results from both samples therefore support the hypothesis that familiarity with literary but not genre fiction is positively associated with RMET performance. More-

² The main effect of undergraduate major, $F(4, 1238) = 3.53, p = .007, \eta_p^2 = .011, 95\% \text{ CI } [.000, .002]$, was driven primarily by higher scores among humanities majors ($n = 394, M = 26.84, SD = 3.84$) than majors in business ($n = 173, M = 26.04, SD = 3.82, t = 2.29, p = .02$), natural sciences ($n = 291, M = 26.24, SD = 3.78, t = 2.04, p = .04$), and participants who indicated "other" ($n = 169, M = 25.62, SD = 3.75, t = 3.47, p < .001$). Majors in the social sciences ($n = 173, M = 26.42, SD = 3.77, t = 2.03, p = .04$) performed better than those who indicated "other."

³ The effect of undergraduate major was significant on for both exposure to literary fiction, $F(4, 1238) = 34.34, p < .001, \eta_p^2 = .096, 95\% \text{ CI } [.068, .129]$, and genre fiction, $F(4, 1238) = 8.60, p < .001, \eta_p^2 = .027, 95\% \text{ CI } [.010, .044]$.

⁴ Sample 1: $M_{Female} = 26.50, SD = 3.86$ vs. $M_{Male} = 25.96, SD = 3.68$; $F(1, 1241) = 4.95, p = .02, \eta_p^2 = .004, 95\% \text{ CI } [.000, .013]$; Sample 2: $M_{Female} = 25.95, SD = 4.03$ vs. $M_{Male} = 25.16, SD = 4.68$; $F(1, 894) = 7.33, p = .006, \eta_p^2 = .008, 95\% \text{ CI } [.000, .023]$.

⁵ Sample 1: $M_{Female} = .52, SD = .27$ vs. $M_{Male} = .45, SD = .26$; $F(1, 1241) = 18.88, p < .001, \eta_p^2 = .015, 95\% \text{ CI } [.004, .031]$; Sample 2: $M_{Female} = .35, SD = .24$ vs. $M_{Male} = .31, SD = .22$; $F(1, 894) = 6.76, p = .009, \eta_p^2 = .007, 95\% \text{ CI } [.000, .022]$.

⁶ Sample 1: $M_{Female} = .47, SD = .28$ vs. $M_{Male} = .37, SD = .26$; $F(1, 1241) = 33.09, p < .001, \eta_p^2 = .026, 95\% \text{ CI } [.011, .045]$; Sample 2: $M_{Female} = .37, SD = .24$ vs. $M_{Male} = .27, SD = .21$; $F(1, 894) = 36.65, p < .001, \eta_p^2 = .039, 95\% \text{ CI } [.018, .067]$.

⁷ Detailed reports of the effects of the experimental conditions for four of the six experiments are reported in Kidd and Castano (2013).

⁸ $M_{Degree} = 25.90, SD = 4.47$ vs. $M_{No degree} = 25.26, SD = 4.23$; $F(1, 894) = 4.64, p = .031, \eta_p^2 = .005, 95\% \text{ CI } [.000, .018]$.

⁹ $M_{Degree} = .397, SD = .248$ vs. $M_{No degree} = .283, SD = .205$; $F(1, 894) = 56.39, p < .001, \eta_p^2 = .059, 95\% \text{ CI } [.032, .091]$.

¹⁰ $M_{Degree} = .362, SD = .251$ vs. $M_{No degree} = .287, SD = .218$; $F(1, 894) = 22.75, p < .001, \eta_p^2 = .024, 95\% \text{ CI } [.008, .048]$.

Table 3
Results of GLMs With RMET as Dependent Variable for Sample 1 ($N = 1,190$)

Variable	β (SE)	(df) F	p	η_p^2	95% CI
Model	—	(9, 1180) 7.03	<.001	.05	[.02, .07]
Literary-ART	.135 (.046)	(1, 1180) 8.56	.003	.007	[.000, .019]
Genre-ART	.002 (.052)	(1, 1180) .00	.963	.000	[.000, .000]
Gender	.106 (.064)	(1, 1180) 2.71	.100	.002	[.000, .010]
Age	-.173 (.036)	(1, 1180) 22.41	<.001	.018	[.006, .036]
Foils	-.006 (.028)	(1, 1180) .05	.831	.000	[.000, .003]
College major	—	(4, 1180) 2.55	.037	.008	[.000, .018]

Note. ART = Author Recognition Test; RMET = Reading the Mind in the Eyes Test. Sample size reflects cases excluded on the basis of Cook's D . Gender coded as Female = 1, Male = 0.

over, this effect could not be attributed to individual differences in age, education, or gender.

Study 2

A second study was conducted to further test the central hypothesis that familiarity with literary fiction would predict ToM performance. A self-report measure of dispositional empathy was included to help test the possibility that the relation between exposure to literary fiction and ToM performance found in the first two samples was attributable to individual differences in trait empathy. That is, it may be that people who are more empathic are both more likely to read fiction and to perform well on tests of ToM because of an underlying interest in others. Although prior research has demonstrated that individual differences in the Five Factor personality dimensions and a tendency to become immersed in fiction do not account for the relation between exposure to fiction in general and ToM performance (Mar et al., 2009), this is to our knowledge the first study to specifically examine whether individual differences in multiple components of trait empathy account for the relation.

Method

Participants ($N = 307$) were recruited using Amazon.com's MechanicalTurk service and were compensated \$1.50 for their participation in the study, which was administered online using Qualtrics. Only data from native English speakers were retained ($N = 299$). Based on the smallest model effect size previously observed ($\eta_p^2 = .05$) and the need to be able to detect a significant model after including the three IRI subscales as covariates, about 300 participants were needed to achieve power of .95 (Faul, Erdfelder, Buchner, & Lang, 2009). Upon granting informed consent, participants completed the RMET and ART as in the prior study.

Participants also completed measures of cognitive empathy (i.e., Perspective Taking [PT]), affective empathy (Empathic Concern [EC]), and self-focused emotional reactivity (Personal Distress [PD]) from the Interpersonal Reactivity Index (IRI, Davis, 1983), a widely used self-report multidimensional measure of empathy. The Fantasy subscale of the IRI, which assesses the tendency to become immersed in fictional worlds, was not administered, as prior research has already demonstrated that it does not account for the relation between reading fiction and ToM (Mar et al., 2009). Each component of empathy was assessed based on participants'

reported agreement with 7 statements on a scale ranging from 1 (*strongly disagree*) to 9 (*strongly agree*). Finally, participants were asked to indicate their age, gender, highest level of attained education, and undergraduate major.

Results

Scores on the RMET and measures of literary and genre fiction exposure were calculated as in the previous study. As with the previous samples, participants were excluded from analysis if their score on the RMET was lower than expected by chance alone ($n = 6$). Participants were also excluded if they selected either no authors on the ART or if they selected more foils than actual authors ($n = 30$), leaving a final sample of 263 participants (55.89% female, 74.05% White, 52.47% college graduates, see Table 5 for other sample characteristics).

A series of one-way ANOVAs showed that female participants were more familiar with genre fiction than males ($M = .31$, $SD = .23$ vs. $M = .25$, $SD = .20$; $F(1, 261) = 5.40$, $p = .02$, $\eta_p^2 = .020$, 95% CI [.000,.065]) and performed better on the RMET ($M = 22.58$, $SD = 3.98$ vs. $M = 21.52$, $SD = 4.20$, $F(1, 261) = 4.36$, $p = .03$, $\eta_p^2 = .016$, 95% CI [.000,.058]). Therefore, gender was included as a covariate in the test of the effects of familiarity with literary and genre fiction on RMET performance. Similarly, EC was positively correlated with familiarity with genre fiction and with performance on the RMET (see Table 5), so it was also included as a covariate. Neither PT nor PD correlated with RMET performance, so they were not included as covariates. When included as covariates, neither approaches significance ($ps > .35$), and none of the other effects change in terms of significance. Age was included as a covariate because it was positively correlated with familiarity with literary and genre fiction as well as with RMET scores (see Table 5). In contrast to findings from the first sample, undergraduate major was not significantly related to RMET performance, $F(4, 257) = 0.36$, $p = .83$. The hypothesis that familiarity with literary fiction predicts ToM performance was tested by regressing RMET scores on familiarity with literary fiction, familiarity with genre fiction, gender, age, EC, and foils selected on the ART. To correct for skew, both measures of fiction familiarity were square root transformed (the same pattern of significant results emerges without transformations). As in the prior study, cases were excluded based on Cook's distance (4.94%), and a test of collinearity

Table 4
Results of GLMs With RMET as Dependent Variable for Sample 2 ($N = 866$)

Variable	β (SE)	(df) F	p	η_p^2	95% CI
Model	—	(6, 854) 14.55	<.001	.09	[.05, .13]
Literary-ART	.223 (.048)	(1, 854) 21.54	<.001	.024	[.008, .048]
Genre-ART	.056 (.047)	(1, 854) 1.38	.241	.001	[.000, .011]
Gender	.077 (.066)	(1, 854) 1.34	.246	.001	[.000, .011]
Education	.057 (.067)	(1, 854) .72	.397	.000	[.000, .009]
Condition	-.221 (.067)	(1, 854) 10.82	.001	.012	[.002, .031]
Foils	-.067 (.033)	(1, 854) 4.06	.044	.004	[.000, .018]

Note. ART = Author Recognition Test; RMET = Reading the Mind in the Eyes Test. Sample size reflects cases excluded on the basis of Cook's D . Gender coded as Female = 1, Male = 0. Education coded as No college degree = 0, College degree or higher = 1. Condition coded as Literary = 0, Comparison = 1.

Table 5
Sample Characteristics and Correlations Among Variables for Study 2

Variable	Age	ART ($\alpha = .95$)	ART foils	Literary ART ($\alpha = .94$)	Genre ART ($\alpha = .89$)	RMET ($\alpha = .75$)	EC ($\alpha = .88$)	PT ($\alpha = .83$)	PD ($\alpha = .86$)
Total sample ($N = 263$)	33.76 (11.09) [32.41, 35.11] .37*** [26, .47]	18.53 (13.68) [16.87, 20.19]	.82 (2.63) [.50, 1.14]	.29 (.22) [.26, .32]	.28 (.22) [.26, .31]	26.11 (5.01) [25.50, 26.71]	6.43 (1.56) [6.24, 6.62]	6.32 (1.31) [6.16, 6.48]	4.17 (1.58) [3.98, 4.36]
ART									
ART Foils	-.03 [-.08, .15]	-.04 [-.16, .07]	.14* [.02, .26]						
Literary ART	.25*** [.13, .36]	.95*** [.93, .96]	.09 [-.02, .21]	.74*** [.68, .79]					
Genre ART	.56*** [.47, .64]	.86*** [.83, .89]	-.14* [-.25, -.02]	.28*** [.16, .38]	.29*** [.17, .39]				
RMET	.18*** [.06, .29]	.34*** [.22, .44]	-.05 [-.17, .06]	.06 [-.18, .05]	.15* [.03, .26]	.20*** [.08, .31]			
EC	.23*** [.11, .34]	.10 [-.01, .22]	.01 [-.11, .13]	.03 [-.08, .15]	.05 [-.06, .17]	.11 [-.00, .23]	.57*** [.49, .65]		
PT	.07 [-.04, .19]	.03 [-.08, .15]	-.04 [-.16, .07]	-.07 [-.19, .04]	-.14* [-.26, -.02]	-.07 [-.19, .04]	.05 [-.06, .17]	-.06 [-.18, .05]	
PD	-.11 [-.22, .00]	-.09 [-.21, .02]							

Note. ART = Author Recognition Test; RMET = Reading the Mind in the Eyes Test; EC = Empathic Concern; PT = Perspective Taking; PD = Personal Distress. Literary ART and Genre ART scores are calculated as proportions of authors recognized. Standard deviations for each mean are reported in parentheses. 95% Confidence intervals for each mean and correlation coefficient are reported in brackets.

* Correlation significant at $p < .05$. *** Correlation significant at $p < .001$.

Table 6
Results of GLM With RMET as Dependent Variable for Study 2
($N = 245$)

Variable	β (SE)	(df) F	p	η_p^2	95% CI
Model	—	(6, 238) 8.50	<.001	.17	[.08, .24]
Literary-ART	.222 (.093)	(1, 238) 5.64	.018	.021	[.000, .071]
Genre-ART	.126 (.108)	(1, 238) 1.37	.243	.013	[.000, .038]
Gender	.225 (.122)	(1, 238) 3.38	.067	.002	[.000, .055]
Age	.040 (.074)	(1, 238) .29	.591	.003	[.000, .024]
EC	.101 (.062)	(1, 238) 2.62	.106	.001	[.000, .049]
Foils	-.125 (.060)	(1, 238) 4.38	.037	.011	[.000, .063]

Note. ART = Author Recognition Test; RMET = Reading the Mind in the Eyes Test; EC = Empathic Concern; PT = Perspective Taking; PD = Personal Distress. Sample size reflects cases excluded on the basis of Cook's D . Gender coded as Female = 1, Male = 0.

revealed that all tolerance statistics were above the conventional threshold of .10 (all >.30). As expected, familiarity with literary fiction predicted RMET performance, but familiarity with genre fiction did not (see Table 6).

Supplementary Analyses

In the analyses reported above, we focus on scores based on the two factors extracted in the factor analysis. Although we favor this empirical approach to identifying patterns of exposure to fiction, we also acknowledge that it is not without ambiguities. Based on reviews of an earlier submission of this paper, we have conducted four additional analyses to address alternate interpretations of the factors.

Edited literary and genre categories. Supplementary analyses were conducted using literary and genre scores calculated after removing authors that a reviewer proposed were improperly categorized by the factor analysis. Specifically, four acclaimed authors known for their work in specific genres were removed from the literary category: Isaac Asimov, Raymond Chandler, Jack London, and J.R.R. Tolkien. Three authors originally included in the genre ART were also removed: Margaret Mitchell (a National Book Award and Pulitzer Prize winner), Ernest Hemingway (Nobel Prize winner), and Herman Wouk (Pulitzer Prize winner). The revised literary and genre ART scores were entered as predictors of RMET performance along with the covariates included in the primary analysis of each sample. Removing these possibly incorrectly classified authors (though see discussion of this above) does not alter the statistical significance of any of the key statistical tests (see Table 7).

Equal numbers of literary and genre authors. The factor analyses led to the identification of a literary factor with twice as

Table 7
Results of GLM With RMET as Dependent Variable and Revised Literary and Genre ART Scores

Sample	Literary	Genre
1	$\beta = .13, SE = .04, p < .001$	$\beta = -.00, SE = .04, p = .950$
2	$\beta = .21, SE = .04, p < .001$	$\beta = .06, SE = .04, p = .155$
3	$\beta = .20, SE = .08, p = .016$	$\beta = .10, SE = .09, p = .281$

Note. RMET = Reading the Mind in the Eyes Test; ART = Author Recognition Test. Covariates included in the primary analysis are included in these models but are not reported.

many authors as the genre factor. To test whether the different effects of exposure to literary and genre fiction were a mere artifact of this imbalance, supplementary analyses were conducted in which literary exposure scores were calculated using only the first 20 literary authors (as they appear in the ART as presented by Acheson et al., 2008). Because the order of the authors in the ART is completely arbitrary, the first 20 constitute a random subsample. Across the three samples, there were no changes in the significance of the relations reported below. Consequently, the relative effects of exposure to literary and genre fiction on RMET performance cannot be clearly attributed to the greater number of authors composing the literary exposure measure (see Table 8).

Accounting for publication dates. A reviewer noted that many of the genre authors have published their works more recently than the literary authors, meaning that they are perhaps less likely to be read in academic settings. If so, the literary scores may actually reflect encounters with fiction in classrooms. To address this potential confound, we created a variable to reflect the average most recent year of publication of each recognized author. For example, James Joyce's most recent novel, *Finnegans Wake*, was first published in 1939, and Tom Clancy's most recent novel, *Command Authority*, was published in 2013. A participant who recognized only those two authors would have a value for this new variable of 1,976.5. Thus, readers of primarily older, and perhaps more canonical, authors would have lower scores on this variable than readers of mostly contemporary authors. Therefore, if the effect of literary familiarity is driven by the older age of works by the literary authors, accounting for the average publication date should eliminate or significantly attenuate it. This variable was added as a covariate to the analyses reported in the main text for all three samples. The results indicate that adding the average publication date covariate does not alter the effect of literary fiction in any of the three samples, either in terms of significance or the magnitude of the standardized regression coefficient (see Table 9).

Analysis of specific genres. Given past research indicating different effects of specific types of genre fiction (Fong et al., 2013), we consulted each author's Wikipedia page was consulted to determine whether the author was clearly linked to a particular genre. Of the authors categorized as literary in the factor analysis, only Isaac Asimov, Raymond Chandler, and J.R.R. Tolkien were associated on Wikipedia with genres (science fiction, crime, and fantasy, respectively). Of the authors categorized as genre authors in the factor analysis, six authors were classified as romance writers: Jackie Collins, Judith Krantz, Margaret Mitchell, James Patterson, Sidney Sheldon, and Danielle Steel. Nine authors were

classified as crime, thriller, mystery, adventure, or detective writers (for brevity, this category will be subsequently referred to as the thriller/mystery category): Tom Clancy, Clive Cussler, Dick Francis, Sue Grafton, John Grisham, Tony Hillerman, Jonathan Kellerman, Robert Ludlum, and Nelson DeMille. Three were categorized as writers of historical fiction: James Clavell, James Michener, and Herman Wouk. Jean M. Auel was classified as a fantasy writer.

Based on these classifications, two new genre fiction scores were created to reflect recognition rates for the categories of romance fiction and thriller/mystery. Participants across the studies recognized, on average, more than two of the authors in each of the categories. These numbers are comparable with those reported in previous studies of specific genres (e.g., Fong et al., 2013). Consequently, additional analyses were conducted using recognition rates of literary, romance, and thriller/mystery authors as predictors of RMET performance. Neither of these two measures of familiarity with specific types of genre fiction significantly predicted RMET performance, and the effect of literary fiction familiarity remained significant (see Table 10). Given that these measures of familiarity with romance and mystery/thriller fiction are completely post hoc, are not supported by the factor analyses, and have not been otherwise validated, we urge caution in interpreting these null effects.

Comparison of recognition rates. A reviewer proposed the literary authors are not as easy to recognize as the genre authors. If so, recognition of those authors may be a more reliable indicator of actual reading habits, regardless of the type of fiction read. However, a comparison of the recognition rates of authors in each category (see Table 2) revealed that recognition rates for literary authors (43.65%, $SD = 22.51$) did not significantly differ from those for genre authors (39.54%, $SD = 22.86$; $F(1, 58) = 0.44$, $p = .516$).

General Discussion

Time spent reading fiction may sharpen our capacity to successfully understand others, as studies over the past decade suggest (Mar et al., 2006, 2009). The research findings we present here go one step further, providing evidence that it is specifically engagement with *literary* fiction that positively predicts theory of mind (ToM) performance. In three independent and large samples, it was found that familiarity with authors of literary, but not authors of genre fiction, predicted participants' performance on the RMET, a well-validated and widely used measure of ToM.

Importantly, despite the differences between the recruitment and consequent makeup of the samples, and the different methods used with the three samples, the results are consistent. Unique methodological features of each study are thus unlikely to explain the reported results. For example, the first sample was recruited via a link embedded in an article about the effects of reading literary fiction on ToM, raising the possibility that participants may have been aware of the hypothesis. However, for this to have affected results, participants would have needed to agree with our hypothesis, be aware of how well they were doing on the RMET, and understand that some of the authors on the ART would be classified as literary and others as genre. That most or many of the participants in the first sample would have responded in this way seems implausible. Likewise, participants in the second sample were recruited to participate in experiments, and experimental condition was included as a covariate in order to rule it out

Table 8
Results of GLMs With RMET as Dependent Variable and Literary and Genre ART Scores Reflecting Equal Numbers of Authors

Sample	Literary (first 20)	Genre
1	$\beta = .14, SE = .04, p < .001$	$\beta = -.00, SE = .05, p = .895$
2	$\beta = .23, SE = .04, p < .001$	$\beta = .05, SE = .04, p = .225$
3	$\beta = .26, SE = .08, p = .001$	$\beta = .05, SE = .09, p = .561$

Note. RMET = Reading the Mind in the Eyes Test; ART = Author Recognition Test. Covariates included in the primary analysis are included in these models but are not reported.

Table 9
Results of GLMs Predicting RMET With Average Publication Year as a Covariate

Sample	Literary	Genre	Average year
1	$\beta = .13, SE = .04, p = .003$	$\beta = .02, SE = .05, p = .597$	$\beta = -.04, SE = .03, p = .194$
2	$\beta = .22, SE = .04, p < .001$	$\beta = .03, SE = .05, p = .559$	$\beta = .00, SE = .00, p = .300$
3	$\beta = .23, SE = .09, p = .014$	$\beta = .12, SE = .11, p = .270$	$\beta = -.09, SE = .06, p = .156$

Note. RMET = Reading the Mind in the Eyes Test. Covariates included in the primary analysis are included in these models but are not reported.

as a potential confound. More generally, the consistency of the effects across the three samples shows that they are robust and cannot be attributed to one particular sample or method.

Although nearly all fiction may provide a basis for simulated social experiences (Koopman & Hakemulder, 2015; Mar & Oatley, 2008), the present findings suggest that literary fiction is most likely to prompt readers to rely extensively on ToM, leading them to more fully recruit ToM-related processes, even beyond the immediate context of reading. This finding is consistent with prior research demonstrating short-term benefits to ToM performance caused by reading short works of literary fiction (Black & Barnes, 2015a; Kidd & Castano, 2013). We propose that these findings emerge because the implied (rather than explicit) sociocognitive complexity, or *roundness* of characters, in literary fiction prompts readers to make, adjust, and consider multiple interpretations of characters' mental states (Zunshine, 2015). Though both prior experimental findings and the current results are consistent with this view, no direct evidence speaks to the precise mechanisms through which literary fiction affects ToM. Future research either focusing on the linguistic, syntactic, and other characteristics of literary texts, or that creates ad hoc texts that vary along specific dimensions, will provide valuable information about such mechanisms.

Before turning to what we see as important implications of the present findings, let us briefly discuss issues that are inherent in the correlational character of the present studies. First, one obvious question is about the possible roles of third variables in the emergence of the relationship between familiarity with literary fiction and ToM performance. Across the three independent samples, this relationship could not be explained by demographic characteristics such as age, gender, or educational attainment. In the first and third samples, undergraduate major was also ruled out as an explanation for the results. This point is particularly important given research linking individual differences in RMET performance to the decision to choose a major in the humanities (Billington, Baron-Cohen, & Wheelwright, 2007).¹¹ Individual differences in personality also seem unable to explain the present effects. Though evidence suggests that readers of different types of fiction (e.g., literary, thriller, romance) differ in certain Big Five personality traits (Kraaykamp & Van Eijk, 2005; Michelson, 2014), these personality traits are not clearly related to RMET performance (Ferguson & Austin, 2010; Nettle & Liddle, 2008). Moreover, prior research has demonstrated that individual differences in personality do not account for the relation between a global measure of exposure to fiction and performance on the RMET (Mar et al., 2009), and self-reported empathic concern did not affect the relation between familiarity with literary fiction and ToM in our second study. Consequently, it does not appear that an obvious third variable can account for the present results.

In the three samples, genre fiction was not uniquely related to RMET performance after accounting for familiarity with literary

fiction. This may appear inconsistent with prior findings of a positive relation between familiarity with romance fiction (but not science fiction/fantasy or suspense/thriller) and RMET performance (Fong et al., 2013). A direct comparison, however, is difficult. The present study included no a priori measure of familiarity with romance fiction, and Fong et al. (2013) did not measure exposure to literary fiction. Furthermore, the genre category in the present study included only six romance writers, limiting our ability to reliably test the effects of this specific genre. Nonetheless, our own and Fong et al.'s (2013) research converge on the point that the extent to which fiction draws attention to characters' thoughts, feelings, and relationships likely underlies its impacts on ToM, a point underscored by recent neuroimaging research (Tamir, Bricker, Dodell-Feder, & Mitchell, 2016). As discussed above, however, how attention is drawn probably makes an important difference (Zunshine, 2015).

The present research speaks to both psychological and literary theory. A growing body of research addressing the behavioral (e.g., Declerck & Bogaert, 2008; Engel et al., 2014), personality (e.g., Ferguson & Austin, 2010; Nettle & Liddle, 2008), and demographic (e.g., Kraus et al., 2010; Sherman, Lerner, Renshon, Ma-Kellams, & Joel, 2015) correlates of ToM in normal adult populations suggests that ToM is not an all-or-nothing developmental achievement, but is recruited to different degrees (and with varying success) across individuals and situations. The present findings provide important evidence of how this fundamental human capacity might be moderated by specific cultural practices (Heyes & Frith, 2014). Instead of being interpreted as evidence of the superiority of literary fiction over genre fiction, the present findings point to the possibility that these different cultural artifacts have distinct influences on the process of social perception and on how we navigate the social world. The understanding of others in terms of their mental states, that is, engaging in ToM processes, is only one strategy for social navigation. Just as important, although potentially problematic as extensive research on category-based perception has shown (Swencionis & Fiske, 2014), is our understanding of others in terms of their social identities and roles (Hirschfeld, 2006). We speculate that genre fiction, with more stereotypical or stock characters, may boost this other strategy of social perception, instead of drawing attention to the idiosyncratic, subjective experiences of others.

Beyond their relations to psychological theory and research, these findings have implications for the study and teaching of literature. The primary finding that exposure to literary fiction positively predicts RMET performance across these broad samples is consistent with the theoretical expectation that literary fiction affords greater opportunities for engaging with characters in a manner that promotes attention

¹¹ We thank an anonymous reviewer for drawing our attention to this research.

Table 10
Results of GLMs Predicting RMET Performance With Specific Genres

Sample	Literary	Romance	Mystery/Thriller
1	$\beta = .14, SE = .04, p = .001$	$\beta = .02, SE = .04, p = .578$ $M = 3.12, SD = 2.032$ 95% CI [3.00, 3.23]	$\beta = -.02, SE = .04, p = .550$ $M = 3.59, SD = 2.56$ 95% CI [3.45, 3.74]
2	$\beta = .22, SE = .04, p < .001$	$\beta = .04, SE = .05, p = .392$ $M = 2.31, SD = 1.88$ 95% CI [2.18, 2.44]	$\beta = .02, SE = .05, p = .678$ $M = 2.76, SD = 2.14$ 95% CI [2.62, 2.90]
3	$\beta = .26, SE = .08, p = .002$	$\beta = .09, SE = .09, p = .294$ $M = 2.22, SD = 1.82$ 95% CI [2.00, 2.44]	$\beta = -.01, SE = .09, p = .899$ $M = 2.34, SD = 2.07$ 95% CI [2.09, 2.59]

Note. RMET = Reading the Mind in the Eyes Test. Means and standard deviations in the Romance and Mystery/Thriller columns reflect the average number of authors identified. Covariates included in the primary analysis are included in these models but are not reported.

to their nuances and complexities (Culpeper, 2001; Hakemulder, 2000; Miesen, 2004). Second, these results suggest that fiction should not be understood as a monolithic construct when it comes to appreciating its potential effects on psychological processes (Koopman & Hakemulder, 2015). Rather, different types of fiction may foster different types of social cognition processes; some require that readers rely more on ToM, whereas others demand greater reference to a fine understanding of social identities and social roles.

In this regard, it should be noted that the very category of literary fiction as understood in our own and related research, is a socially constructed category that is culturally (Western) and historically (modern) bounded. The focus on psychologically complex round characters, which is considered a hallmark of literary fiction, reflects a specific cultural and historical understanding of what is valuable and important: the individual. Needless to say, it was not always so. What is associated with literariness in contemporary American culture was considered an undesirable marker of bourgeois decadence by mid-20th century proponents of Socialist Realism. In other cultural and historical periods or settings, fiction that is more oriented toward the transmission of norms or depicting archetypal flat characters may stand higher in the hierarchy of genres (Eder et al., 2010). This kind of fiction, as speculated above, may foster Theory of Society socio-cognitive processes, rather than ToM processes.

Just as reading critically acclaimed fiction is theorized to promote ToM insofar as it draws attention to others' subjective experiences, it seems likely that other cultural practices may affect ToM in the same way. Biographies, memoirs, and narrative journalism are forms of nonfiction that could have the same effect (Tamir et al., 2016), and recent research shows that playing a nonviolent narrative video game (Bormann & Greitemeyer, 2015) or watching acclaimed TV dramas (Black & Barnes, 2015b) also improves ToM. Moreover, social environments that provide greater opportunities for interactions that are not rigidly based on social identities and roles may also foster ToM development. For example, a conversation among new members of a civic or religious organization would be more likely to prompt its participants to rely on ToM than a scripted telemarketing call. The influence of these practices notwithstanding, it is possible that the effects of literary fiction may be especially apparent because it allows readers to reflect upon the behavior and mental states of characters at their own pace and with virtually none of the risks (perceived or real) associated with real world social behavior.

The findings and rationale presented here support a model of cultural engagement that includes reciprocal relations of minds and

culture. Art that elicits culturally valued psychological processes may be more likely to be produced and endorsed by critics. Supported by engagement with such art, those psychological processes may in turn become more efficient and valued. This view is consistent with recent advances in psychological theories of culture that posit that "repeated and continuous engagement in some select set of practices involving certain features . . . may lead to some characteristic patterns of psychological response" (Markus & Kitayama, 2010, p. 427). In this way, the creative works that are especially admired may express *and* cause differences in how people across communities perceive their real social worlds. This theory also aligns with sociological approaches to understanding the emergence and transmission of culture, such as Bourdieu's concept of *habitus* (Bourdieu, 1989; Lizardo, 2004), which emphasizes the importance of sociocultural affordances in shaping patterns of perception and thought. As psychological research more specifically addresses the impacts of cultural products, practices, and institutions, it may become more relevant to traditionally sociological questions regarding the emergence and transmission of culture.

Alongside existing results, those presented here also raise interesting theoretical and empirical questions about the broader cultural impacts of fiction. For example, research suggests both a positive relation between reading fiction and SES (National Endowment for the Arts, 2013; Notten et al., 2015), and a negative relation between SES and ToM (e.g., Kraus et al., 2010; Sherman et al., 2015). It seems possible that the experience of deep intersubjectivity afforded by literary fiction (which is often seen as high status) may counteract the feelings of social dominance (Sherman et al., 2015) and independence (Kraus et al., 2010) that are thought to lie at the root of the negative relation between SES and ToM. For the same reason, reading literary fiction may also help to improve ToM among individuals who struggle with interpersonal relationships, such as those with subclinical but high levels of narcissistic self-focus (Hepper, Hart, & Sedikides, 2014; Vonk, Zeigler-Hill, Mayhew, & Mercer, 2013). Future research may help to better reveal the social and individual effects of cultivating literary fiction and its readers.

The finding that familiarity with literary fiction is positively related to performance on an advanced test of ToM helps to refine understanding of variability in ToM among normal adults while addressing theoretical and pedagogical questions in the humanities. More broadly, this research reflects a concrete approach to studying engagement with cultural products that will contribute to psychologists' knowledge of cultural sources of variability in important capacities or personality dimensions. It may also contribute to a more informed

society in which individuals are equipped to better understand how their engagement with fiction affects their experiences of the real world.

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