Building the Liberal Imagination: Reading literary fiction is associated with a more complex worldview

Word Count: 7,768

Abstract

What are the effects of reading fiction? We propose that literary fiction alters views of the world through its presentation of *difference* - different minds, different contexts, and different situations - grounding a belief that the social world is complex. Across four studies, two nationally-representative and one preregistered (total n = 5,176), we find that the reading of literary fiction in early life is associated with a more complex worldview in Americans: increased attributional complexity, increased psychological richness, decreased belief that contemporary inequalities are legitimate, and decreased belief that people are essentially only one way. By contrast, early-life reading of narrative fiction that presents more standardized plots and characters, such as romance novels, predict holding a less complex worldview.

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The job of criticism would seem to be, then, to recall liberalism to its first essential imagination of variousness and possibility, which implies the awareness of complexity and difficulty. To the carrying out of the job of criticizing the liberal imagination, literature has unique relevance, not merely because so much of modern literature has explicitly directed itself upon politics, but more importantly because literature is the human activity that takes the fullest and most precise account of variousness, possibility, complexity, and difficulty.

-Lionel Trilling, The Liberal Imagination (1950)

Novels disappoint not only by being clumsily written or conceived but by presenting versions of the world that are simpler and more sanitized than we know it to be.

-Parul Sehgal (2020)

Thinkers from Plato to Horace to Dryden have given outsized importance to the seductive power that literature has to deliver moral lessons and to shape a polity, with recent empirical work from the National Endowment for the Arts finding that those who are more engaged with literature are more civically engaged (National Endowment for the Arts, 2007; see also Catterall, et al., 2012 for longitudinal effects; and see Campagna, et al., 2020; and Jeannotte, 2003 for similar evidence from Italy and Canada, respectively).

In trying to understand the roots of the psychological effects of reading fiction, researchers have converged on a paradigm that casts narrative experience as a way of safely simulating the social world: through the work required to step into the shoes of others, we gain practice in engaging with other minds and gain psychological anecdotes to draw upon when encountering difference in the real world (see e.g. Mar & Oatley, 2008). In line with this view, meta-analyses show that those that read more fiction have better empathic abilities and a stronger ability to take the perspectives of others, both correlationally (Mumper & Gerrig, 2017) and when exposed to fiction in controlled experiments (Dodell-Feder & Tamir, 2018). By making

more empathic citizens, this approach proposes, reading creates a more civically-engaged populus (e.g. Mirra, 2018).

To reduce fiction to the simple simulation of individual minds, however, is to privilege a specific sort of historically recent first-person narration over other narrative forms. Fiction is as much about the creation of situations and scenarios as it is about the creation of characters (e.g. Saunders, 2021; Wood, 2008), and even fiction that is not conventionally psychological (as with the aggressively exterior work of Alain Robbe-Grillet and the *nouveau roman*, or, say, all of Homer) still has value. By introducing readers to difference, even if that difference is not expressed as a different cast of mind, we argue that fictional experience can nevertheless remind readers that the world is complex, not simple; with powerful psychological effects.

This assertion of difference and complexity is psychologically vital. People vary in their attributional complexity (Fletcher, et al., 1986), or comfort with ambiguity and willingness to understand behavior in terms of complex systems, rather than simple, inherent, causes. People with greater dispositional attributional complexity think about themselves and others more flexibly; they're more likely to look to the situations shaping behavior over inherent traits of the person acting, and less likely, for example, to assume that beliefs when expressed under obvious duress are truly held by the expressor (correspondence bias; Devine, 1989; Horhota & Blanchard–Fields, 2006). Those with less attributional complexity, by contrast, are more likely to see outcomes of events as having single, simple, discrete causes (monocausal attribution); more likely to be overconfident in their judgements; more likely to blame others for their own bad outcomes; and even more likely to bend towards paranoia and conspiratorial ideation (Mehl et al., 2014; Randjbar, et al., 2011).

Understanding the world as varied and complex has clear consequences for how one thinks about societal injustice. Those with greater attributional complexity are more likely to identify systemic factors leading to unequal treatment within a society instead of blaming those individuals who have failed to lift themselves with their own bootstraps (Reid & Foels, 2010). In its focus on the manifold causes of human behavior, stemming from both the person and the situation, greater attributional complexity helps to anchor the liberal imagination and to provide the basis needed to be good citizens of a modern multicultural democracy.

And, even above and beyond civic benefits, a greater sense of the complexity of the world may increase one's sense of psychological richness (Westgate & Oishi, in press). Psychological richness, a key component of living a 'good life,' involves a sense of one's life as full of interesting and perspective-changing experiences, that one is, ultimately, gaining wisdom (Oishi et al., 2019). In viewing the world as more complex, a person is more likely to have experiences that change their mind, that allow them to think about problems differently, and to practice the cognitive flexibility needed in contemporary society.

Critically, we argue, not all narrative fiction should increase a reader's perception of the world as a complicated place. Narratives that do not challenge their readers, even if such narratives require the simulation of other minds and allow for practice in navigating the social world, should not generate a sense of the variousness, possibility, complexity, and difficulty of life that make up the liberal imagination; rather, they may bolster a sense of the world as simple, orderly, and predictable. By giving readers repeated experiences with stereotyped worlds, they may reinforce a worldview that is narrower, less charitable, and less able to grapple with difference. Take, for example, romance novels - among the most popular genres in contemporary literature. Romance novels, like literary fiction, require the reader to mentalize about others, and

the two genres have formal similarities in terms of their 'literariness.' However, romance novels are characterized by stock settings, characters, and plots, thereby differing from literary fiction in the degree to which they pose a challenge to a reader's view of the world (see Modleski, 1982; Radway, 1984 for ethnographies of the relationship between romance novels and their readers, and see Fuchs, 2004; Regis 2003 for the formal elements that are commonly identified with romance novels).To quote one acclaimed romance novelist about the genre, "Successful authors become successful not because of their conventional writing skills, but because of how accessible they make their fantasies." (Krentz, 1992, p. 4). *Accessibility*, ease; and not difference, in other words, are the keys to a successful romance novel.

If increasing empathy and perspective-taking are the active ingredients for fiction's relationship with the liberal imagination, then reading works such as romance novels should have similar effects in fostering the liberal imagination as their less-predictable literary fiction counterparts. On the other hand, if literature anchors the liberal imagination by increasing a sense of difference, the reading of literary fiction will predict greater worldview complexity than the reading of other narrative forms.

To investigate this question, we conducted four surveys of Americans (total n = 5,176), including two surveys sampled to be nationally-representative (combined n = 2,564), including a preregistered replication, to identify a relationship between the genres of books that a person reads and the complexity of their worldview. All materials, data, codebooks, and analysis scripts can be found at https://osf.io/68g5e/?view_only=ab38c4444e5e4cf9a949cd7caa430a9e.

Study 1: Attributional Complexity

In Study 1, we used a sample of American adults to examine whether people's (self-reported retrospective) reading habits as children and teenagers predicted current tendency to prefer complex explanations for social behavior over simpler ones.

Method and Results

In Study 1, we recruited 409 Amazon mTurk workers, covering a wide demographic background: mean age = 36.45 years, SD = 12.6 years; 50% women; 64% white, 13% Black; median income = $45-60,000; and a median political affiliation leaning slightly Democratic. As part of a broader battery of questions, we asked them how often they read in a number of genres while growing up, and to complete both the Attributional Complexity Scale (Fletcher et al., 1986), a 28-item scale (alpha = .90 [.88, .91]) measuring how much respondents prefer complex explanations for social behavior over simpler ones (sample item: "Once I have figured out a single cause for a person's behavior I don't usually go any further.") and the Psychologically Rich Life Questionnaire (Oishi et al., 2019), a 12-item scale (alpha = .92 [.90, .93]) measuring the degree to which a person's life is psychologically "rich" (sample item: "On my deathbed, I am likely to say ''I have seen and learned a lot").

Of the 369 participants who passed our attention check, we analyzed the relationship between reading in various genres and attributional complexity, while controlling for participants' age, gender, education, income, political leanings (regarding both social and economic issues), and their perceived place on the social ladder of Americans. Our sample allows us 80% power to detect a Cohen's $f^2 = .021$. f^2 measures the proportion of variance accounted for by a predictor in a model above and beyond other variables; for interpretation, Cohen (1988) suggested that an $f^2 = .02$ represents a generally small effect, $f^2 = .15$ represents a medium effect, and $f^2 = .35$ represents a large effect. See

https://osf.io/ejdmt/?view_only=986cedb4ee104e62a76af463430a867c for the full regression tables for all measures analyzed in this study.

We found a marginal relationship between frequency of reading literary fiction while growing up and increased complexity of one's attributional style, $b = 0.051$ [-0.00028, 0.10], $se = .026$, $t(358) = 1.96$, $p = .051$, $f^2 = .011$. We found that reading more, by itself, was not enough to increase attributional complexity, and that, for example, reading more romance novels in early life was related to decreased attributional complexity, $b = -0.080$ [-0.13, 0.029], $se = .026$, $t(358) = -3.07$, $p = .0023$, $f^2 = .026$. See Figure 1 for a graphical representation of the betas for all genres of reading measured; we replicate these effects in Study 4.

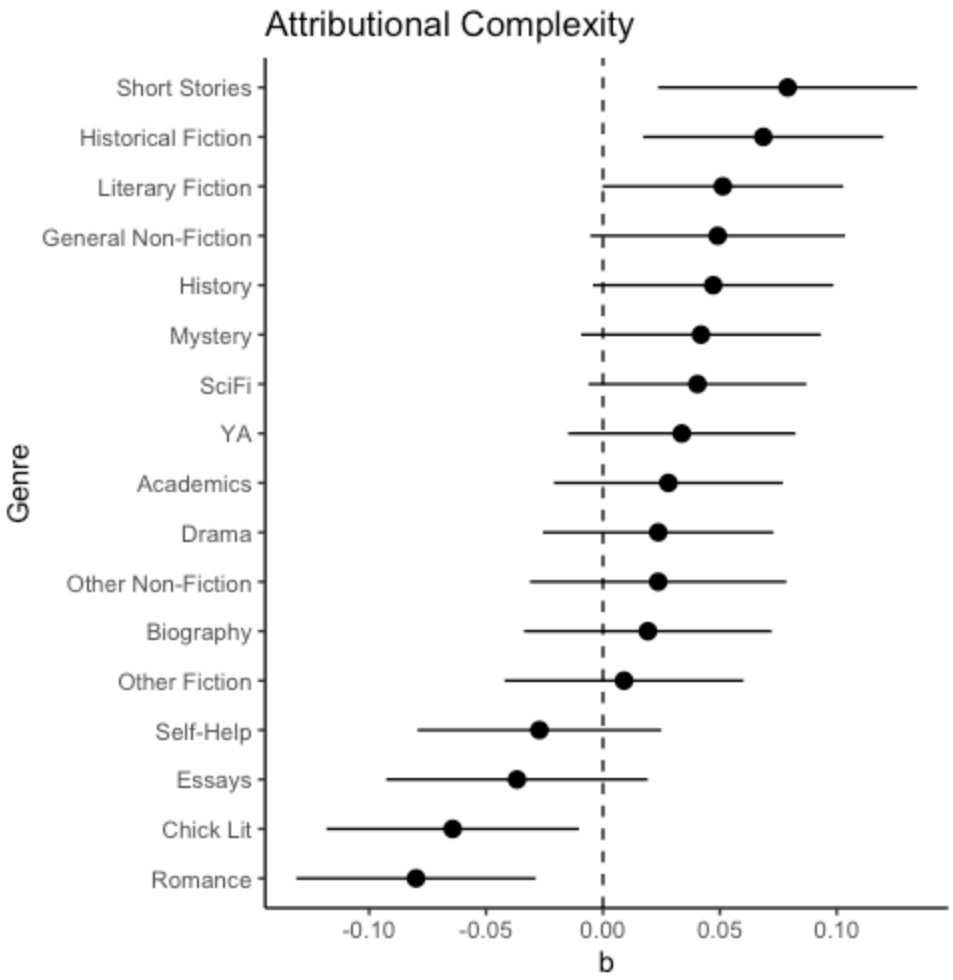


Figure 1. Attributional complexity and self-reported intensity of reading across genres while growing up

Note: Lines indicate 95% confidence intervals for all estimates.

We then analyzed the relationship between early-life reading and self-reported psychological richness. Using the same controls, we again found a relationship between the frequency of reading literary fiction while growing up and increased psychological richness, b = 0.11 [0.047, 0.18], se = .034, $t(358) = 3.34$, $p < .001$, $f^2 = .031$. Once again, we found that reading more, by itself, was not enough to increase richness, and that, for example, reading more romance novels was not related to increased richness, b = -0.0028 [-0.071, 0.065], se = .034,

$t(358) = -0.82$, $p = .94$, $f^2 = .000019$. See Figure 2 for a graphical representation of the betas for all genres of reading measured.

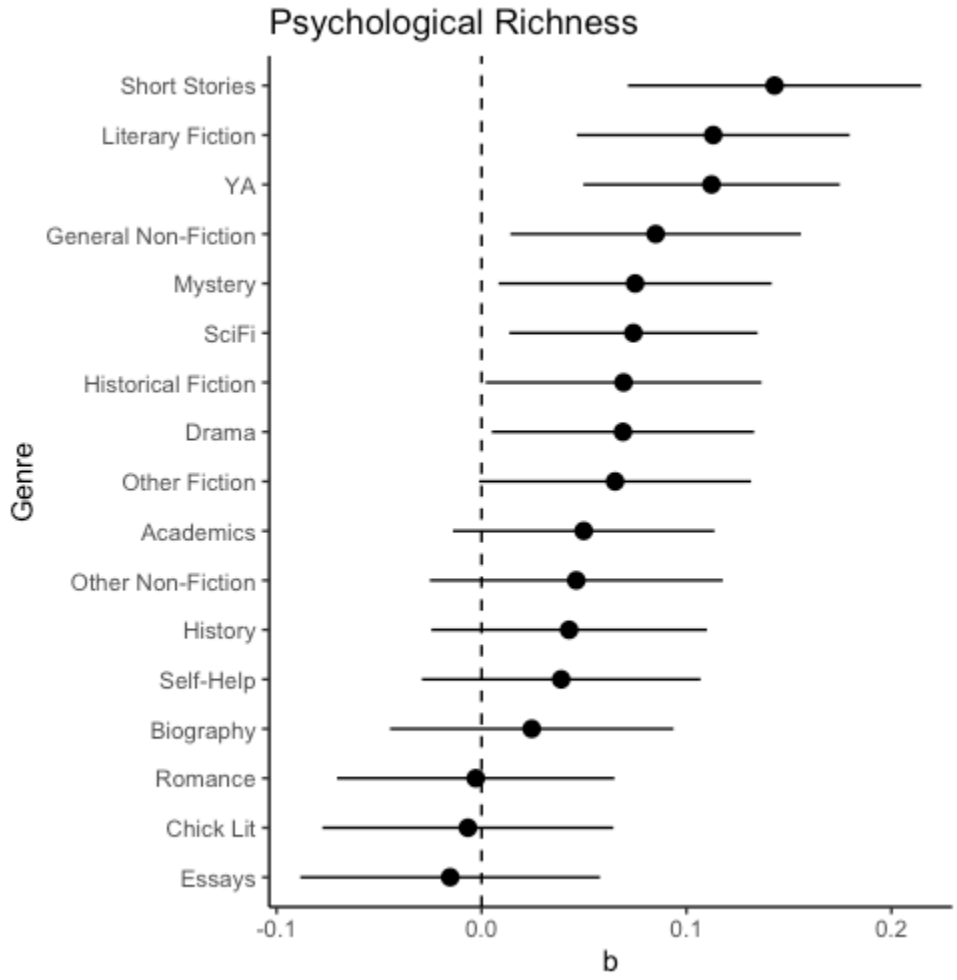


Figure 2. Psychological richness predicted by self-reported intensity of reading across genres while growing up, with demographic controls.

Note: lines indicate 95% confidence intervals for all estimates.

Study 2: Belief in System Legitimacy

In Study 2 we extended our findings to the understanding of systemic injustice, further exploring whether early-life reading was a uniquely powerful predictor as opposed to reading patterns in the current day.

Method and Results

We recruited 2,243 students from a large southeastern public university (mean age = 18.72 years, SD = 1.40 years; 69% women; 71% white, 7% Black; and a median political affiliation of slightly liberal) across three separate semesters of data collection. Due to missingness in the data, sample sizes for any given test range from $n = 1185$ to $n = 1251$. The lower-bound of this sample allowed us to have 80% power to detect a Cohen's $f^2 = .0067$.

As part of a psychology class participation requirement, participants completed a series of self-report measures, including self-reported reading habits, both currently and when growing up, as well as their system justifying beliefs (O'Brien & Major, 2005). This scale contains 16-items (alpha = .87 [.86, .87]) measuring a range of attitudes about the legitimacy of the current social order, including beliefs about the justness of outcomes in the world (Belief in a Just World subscale, alpha = .80 [.78, .81], sample item: "I feel that people earn the punishments and rewards they get"); the importance of hard work (Protestant Work Ethic subscale, alpha = .74 [.72, .75], sample item: "If people work hard enough they can be whatever they want to be in life"); the ability of people to rise up the social ladder (Belief in Individual Mobility subscale, alpha = .77 [.76, .79], sample item: "Our society is an open society where all individuals can achieve higher status."); and the appropriateness of status differences in society (Belief in System Legitimacy subscale, alpha = .76 [.74, .78], sample item: "Differences in status between groups in American society are fair.").

Using models controlling for age, gender, family income, parental education, political leanings, and perceived socioeconomic status within the US, with an additional control for the semester that students participated in, we found that reading literary fiction predicted decreased Belief in System Legitimacy, both in terms of reading habits in early life b = -0.032 [-0.062, -0.0016], se = .015, $t(1176)$ = -2.07, p = .039, f^2 = .0036; and in terms of reading habits in the present day, b = -0.037 [-0.071, -0.0037], se = .017, $t(1186)$ = -2.18, p = .029, f^2 = .0040. As with Study 1, not all genres of reading had the same psychological effects, with the majority being unrelated, in this sample, to a belief in system legitimacy.[1] See Figure 3 for a graphical representation of the betas for all genres of reading that we asked about, and see https://osf.io/ejdmt/?view_only=986cedb4ee104e62a76af463430a867c for the regression tables for all scales, including other elements of the system justification scale. See the online supplement for a description of the other scales investigated in this study.

[1] While we also found significant relationships, in the predicted direction, between early-life literary fiction reading and other subscales of the system justification scale, as well as with the overall scale, these additional results did not replicate in Study 3 and so we instead report them on the project's OSF page.

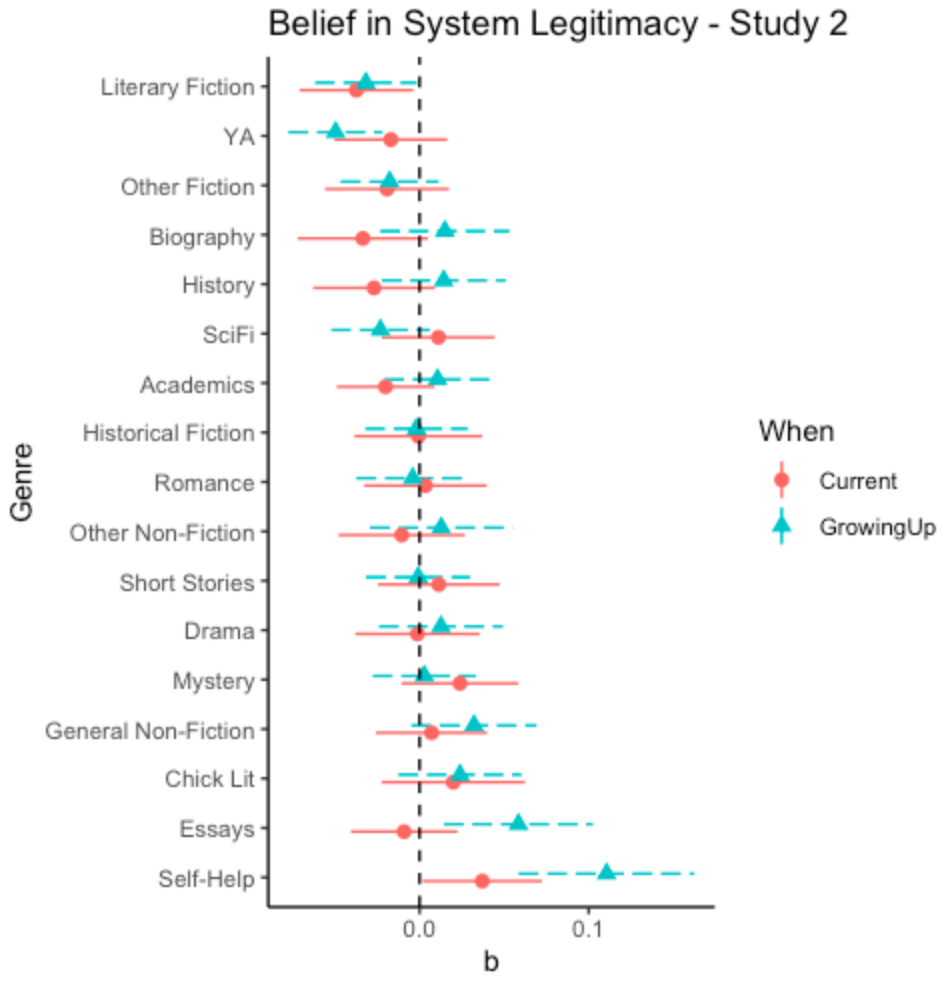


Figure 3. Belief in system legitimacy predicted by the self-reported intensity of reading across genres, both while growing up and currently, with demographic controls.

Note: lines indicate 95% confidence intervals for all estimates.

Study 3: Essentialism, Empathy, and Perspective-Taking

In Study 3, we used a national sample to further examine the relationship between reading habits and possessing an uncomplicated view of the world. In addition to replicating analyses regarding system justification and contemporary inequalities, we also examined relationships with essentialism, empathic concern, and perspective-taking.

Method and Results

We used a survey firm, Lightspeed GMI, asked to create a nationally-representative sample, to recruit 1817 participants (mean age: 49.84 years, SD = 12.29 years; 61% women, 86% white, 10% Black; median income = $35,000-$49,999; median political affiliation of neutral).

Among a battery of questions, we asked about reading habits and system justification (using the same items as in Study 2; overall scale alpha = .85 [.84, .86]; Belief in a Just World subscale alpha = .83 [.82, .85]; Protestant Work Ethic subscale alpha = .64 [.62, .67]; Belief in Individual Mobility subscale alpha = .65 [.62, .68]; Belief in System Legitimacy alpha = .59 [.56, .62]).

We additionally asked about psychological essentialism, or one's beliefs in individual essences (Bastian & Haslam, 2006), a 23-item scale with 3 subscales (overall alpha = .75 [.74, .77]): a Biological subscale (alpha = .68 [.65, .70]), measuring beliefs that the type of person someone is can be determined largely by genetic inheritance (sample item: "The kind of person someone is can be largely attributed to their genetic inheritance"); a Discreteness subscale (alpha = .58 [.55, .61]), measuring beliefs that people generally exist only 'one way' and that their actions are predictable based on some immutable qualities of the self (sample item: "The kind of person someone is, is clearly defined; they either are a certain kind of person or they are not"); and an Informativeness subscale (alpha = .50 [.46, .53], measuring beliefs that it is easy to know what kind of person someone is based on a few basic traits (sample item: "When getting to know a person it is possible to get a picture of the kind of person they are very quickly").

Finally, in line with previous work (e.g. Dodell-Feder & Tamir, 2018; Mumper & Gerrig, 2017) we additionally asked about participants' empathic concern (alpha = .78 [.77, .80], sample item: "I am often quite touched by things that I see happen") and perspective taking (alpha = .57

[.55, .60], sample item: “Before criticizing somebody, I try to imagine how I would feel if I were in their place.”), using items from the Interpersonal Reactivity Index (Davis, 1980).

Among the 1514 people who passed our attention check (a sample that gives us 80% power to detect a Cohen’s $f^2 = .0052$), we found that the timing of reading habits matters as much as the genre of reading. Using the same controls as in Study 2: age, gender, family income, parental education, political orientation, and perceived socioeconomic status within the US (minus a control for semester, since data were collected from a single non-college sample), we again find that those who read more literary fiction when growing up had decreased Beliefs in System Legitimacy, $b = -0.16$ [-0.28, -0.032], $se = .063$, $t(1483) = -2.48$, $p = .013$, $f^2 = .0041$. However, we find that current-day patterns of novel reading did not predict beliefs about system legitimacy, $b = -0.035$ [-0.16, 0.089], $se = .063$, $t(1484) = -0.56$, $p = .58$, $f^2 = .00040$. This pattern generally held across genres - in instances where genre reading habits predicted beliefs in system legitimacy, it was largely in early-life patterns of reading, not in current habits. See Figure 4 for a graphical representation of all genres of reading measured. In contrast with Study 2, we did not find evidence for a significant relationship between other aspects of the system justification scales and literary-fiction reading.

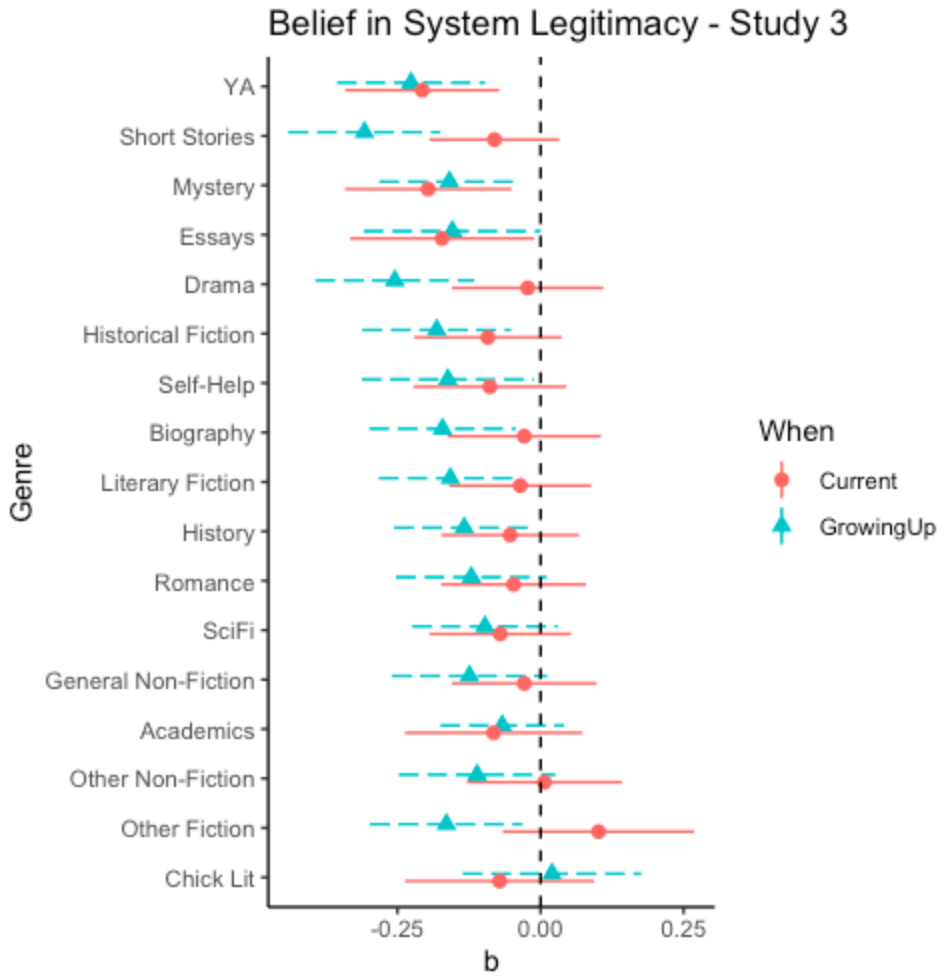


Figure 4. Belief in system legitimacy predicted by the self-reported intensity of reading across genres, both while growing up and currently, with demographic controls.

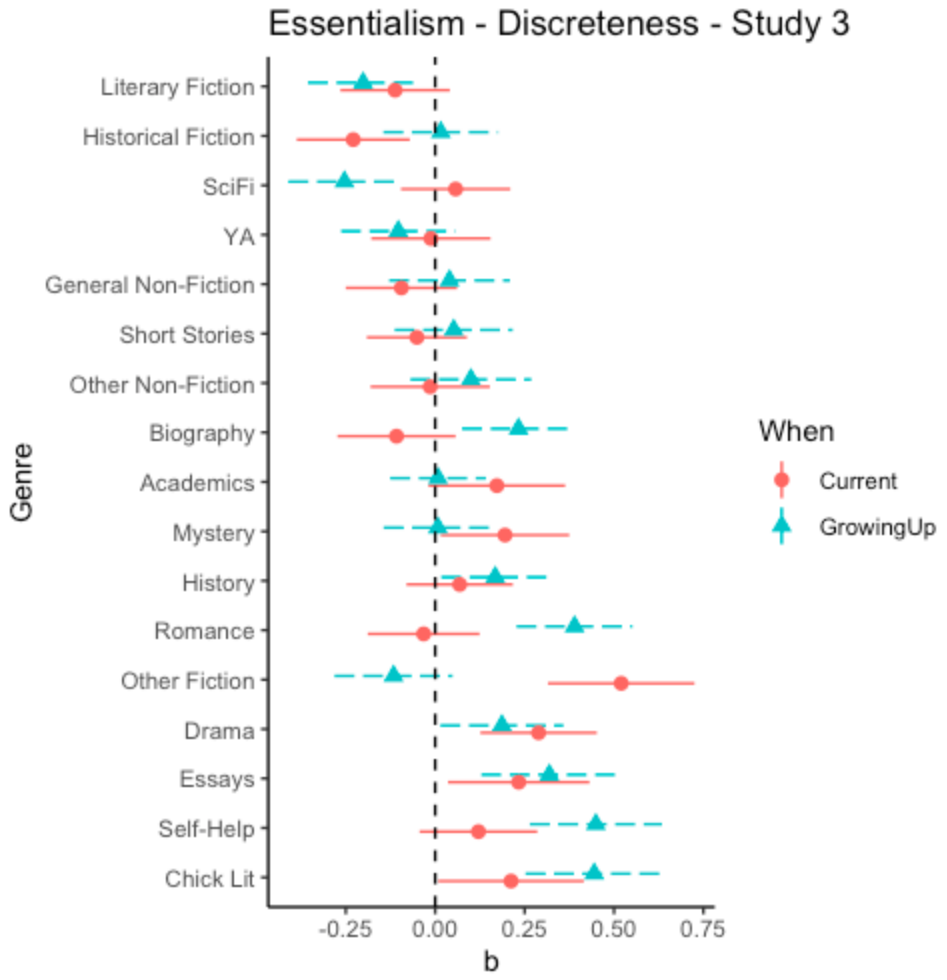
Note: lines indicate 95% confidence intervals for all estimates.

We found a similar pattern predicting essentialist beliefs. Those who read more literary fiction when young were less likely to endorse the idea that people are only one sort of way (Essentialism Discreteness subscale), b = -0.20 [-0.36, -0.047], se = .079, $t(1479)$ = -2.56, p = .010, f^2 = .0044; while current-day patterns of literary-fiction-reading did not predict discreteness, b = -0.11 [-0.27, 0.041], se = .078, $t(1480)$ = -1.44, p = .15, f^2 = .0014. Again, we found that simply reading more fiction did not predict less essentialist/discreteness thinking

across the board, and that, for example, reading more romance novels when younger was associated with *more* essentialist/discreteness thinking, $b = 0.40$ [0.23, 0.55], $se = .083$, $t(1474) = 4.71$, $p < .001$, $f^2 = .015$; though current patterns of romance-novel reading did not predict essentialist/discreteness thought, $b = -0.032$ [-0.19, 0.12], $se = .080$, $t(1479) = -0.41$, $p = .69$, $f^2 = .00011$. Likewise, effects were specific to beliefs about discreteness; there were no reliable relationships with the biological or informativeness subscales of essentialism. See Figure 5 for a graphical representation of the betas for various genres of reading.

Figure 5. Essentialist thinking predicted by the self-reported intensity of reading across genres, both while growing up and currently, with demographic controls.

Note: lines indicate 95% confidence intervals for all estimates.



In line with previous studies that have found that reading, generally, predicts increased empathy and perspective-taking (e.g. Dodell-Feder & Tamir, 2018; Mar & Oatley, 2008; Mumper & Gerrig, 2017), we too find that most forms of early life reading predict increased empathic concern (with the exception of increased reading of Romance novels, $b = 0.11$ [-0.042, 0.26], $se = .077$, $t(1478) = 1.42$, $p = .16$ and Science Fiction, $b = 0.11$ [-0.037, 0.25], $se = .075$, $t(1479) = 1.47$, $p = .14$); and that more reading predicted more perspective-taking regardless of timing or genre. See Figure 6 for a graphical representation of all forms of reading that we asked about, and see https://osf.io/ejdmt/?view_only=986cedb4ee104e62a76af463430a867c for all regression tables for all measures. See the online supplement for a description of all other scales that we measured

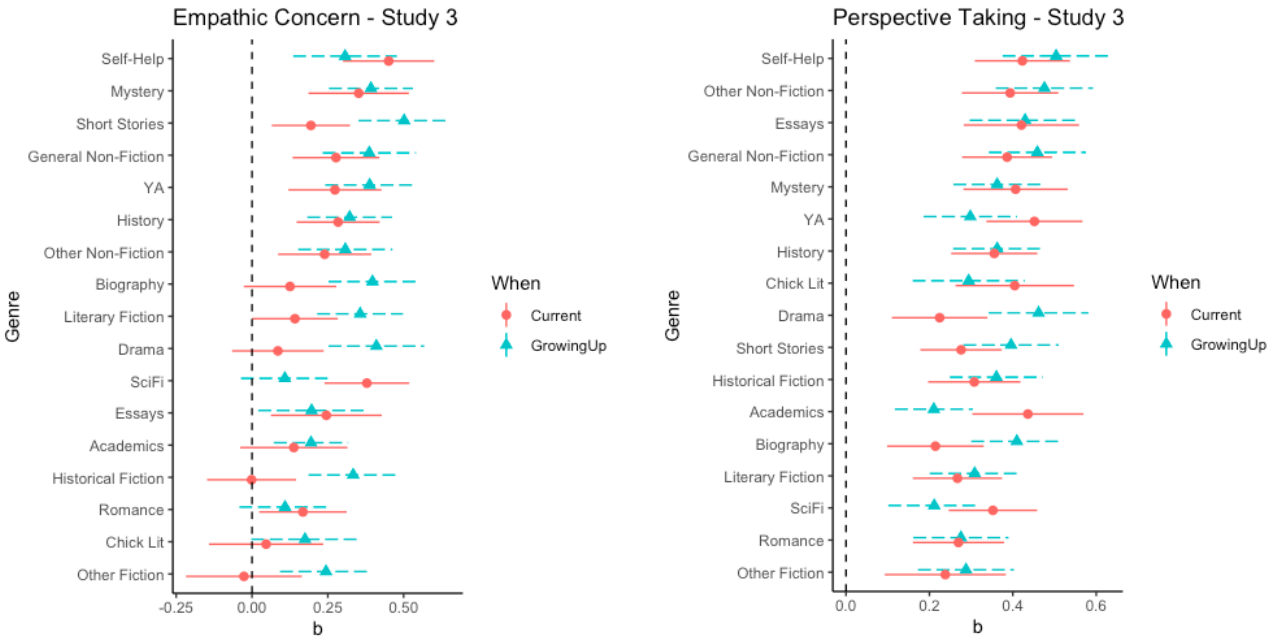


Figure 6. Empathy and perspective-taking predicted by the self-reported intensity of reading across genres, both while growing up and currently, with demographic controls.

Note: lines indicate 95% confidence intervals for all estimates.

Study 4: A Preregistered National Replication

In Study 4, we replicate the findings of Studies 1-3 in a well-powered nationally-representative sample of Americans. The preregistration can be found at https://osf.io/ytxzw/?view_only=2cfd6f40147b40548febe6ca4590f177.

Methods and Results

We used a sampling firm, Lightspeed GMI, to recruit 1404 participants, with the sample designed to be nationally-representative in terms of age, gender, race, education, household income, and US Census region.

For confirmatory purposes, participants were asked about their reading habits, using the same questionnaire as in Study 3, and were additionally given the Attributional Complexity (alpha = .87) and Psychological Richness (alpha = .95) scales of Study 1, the Belief in System Legitimacy subscale of the System Justification scale of Studies 2 & 3 (alpha = .61), and the Discreetness Subscale of the Essentialism scale of Study 3 (alpha = .35). For exploratory purposes, participants were also given the Intellectual Humility scale (Leary et al., 2017), a six-item scale that measures how willing people are to realize that their beliefs may be incorrect (alpha = .89, sample item = “I accept that my beliefs and attitudes may be wrong”), and the Simple Certain Knowledge scale (adapted from Barger et al., 2017), a nine-item scale that measures beliefs that knowledge in a domain is objective, unchanging, and understood by everyone in the same way (alpha = .91, sample item = “Most work in science only has one answer”).

In line with the previous studies, we hypothesized that frequency of early-life reading of literary fiction would predict (controlling for age, gender, family income, parental education, political leanings, and perceived socioeconomic status within the US) increased attributional complexity, an increased sense of psychological richness, decreased essentialism (discreteness subscale), and decreased belief in system legitimacy. We hypothesized that this effect would not apply to all forms of reading, and that having read more Romance novels, by contrast, would not predict this pattern of results.

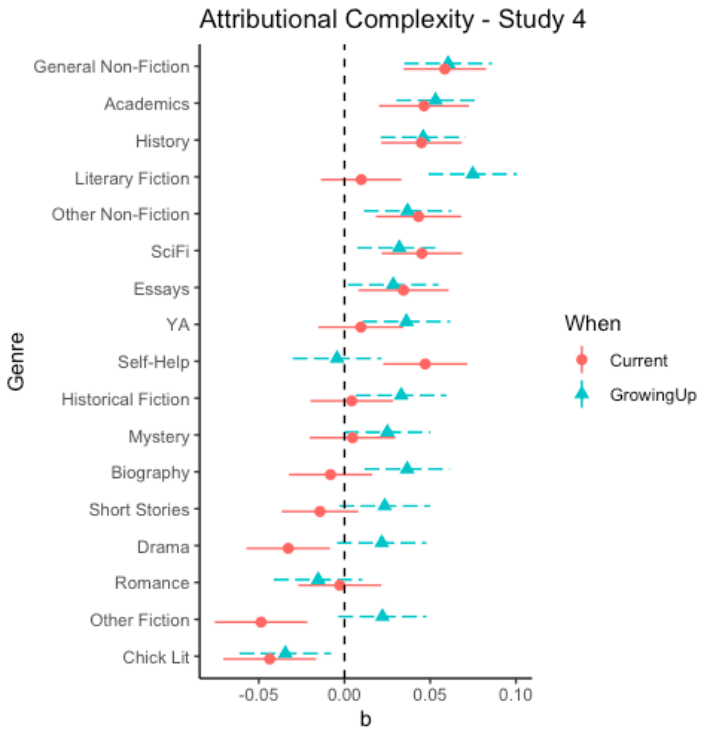
Confirmatory Analyses

Among the 1050 people who passed our attention checks (mean age: 48.81 years, SD = 17.00 years; 50.3% women, 75.8% white, 11.6% Black; median income = $50,000-$64,999; median political affiliation of neutral), a sample that gives us power to detect an effect of Cohen's $f^2 = .0075$, we found evidence for the predicted relationships. Using the same controls as Studies 2 and 3, we find that those who read more literary fiction when growing up had increased attributional complexity, $b = 0.075$ [0.049, 0.10], $se = .013$, $t(1020) = 5.70$, $p < .001$, $f^2 = .032$; increased psychological richness, $b = 0.24$ [0.20, 0.28], $se = .021$, $t(1020) = 11.27$, $p < .001$, $f^2 = .13$; decreased beliefs in system legitimacy, $b = -0.061$ [-0.099, -0.024], $se = .019$, $t(1020) = -3.21$, $p = .001$, $f^2 = .0040$; and decreased endorsement of essentialism, $b = -0.036$ [-0.058, -0.0140], $se = .011$, $t(1020) = -3.22$, $p = .001$, $f^2 = .010$.

By contrast, we find that current-day literary-fiction reading habits did not predict attributional complexity, $b = 0.0098$ [-0.014, 0.033], $se = .012$, $t(1483) = 0.82$, $p = .41$, $f^2 = .00065$; nor did it predict endorsement of essentialist beliefs, $b = -0.0065$ [-0.026, 0.013], $se = .010$, $t(1020) = -0.64$, $p = .52$, $f^2 = .00040$. Increased present-day reading of literary fiction did, however, predict increased psychological richness, $b = 0.20$ [0.16, 0.24], $se = .019$, $t(1020) =$

10.25, $p < .001$, $f^2 = .10$; and decreased beliefs in system legitimacy, $b = -0.035$ [-0.069, -0.0011], $se = .017$, $t(1020) = -2.02$, $p = .043$, $f^2 = .0040$.

Finally, we found that our effects did not encompass all forms of fiction, as, for example, early-life reading of romance novels did not predict any difference in attributional complexity, $b = -0.015$ [-0.041, 0.011], $se = .013$, $t(1021) = -1.16$, $p = .25$, $f^2 = .0013$; nor did it predict belief in system legitimacy, $b = -0.016$ [-0.054, 0.021], $se = .019$, $t(1021) = -0.86$, $p = .39$, $f^2 = .00071$. Early-life romance reading did, however, predict increased psychological richness, $b = 0.16$ [0.12, 0.21], $se = .022$, $t(1021) = 7.47$, $p < .001$, $f^2 = .055$; and increased endorsement of essentialism, $b = 0.042$ [0.020, 0.064], $se = .011$, $t(1021) = 3.80$, $p < .001$, $f^2 = .014$. See Figure 7 for a graphical representation of the betas for all genres of reading measured, and see https://osf.io/ejdmt/?view_only=986cedb4ee104e62a76af463430a867c for the regression tables.


Attributional Complexity - Study 4
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Academics
History
Literary Fiction
Other Non-Fiction
SciFi
Essays
YA
Self-Help
Historical Fiction
Mystery
Biography
Short Stories
Drama
Romance
Other Fiction
Chick Lit
Genre
-0.05
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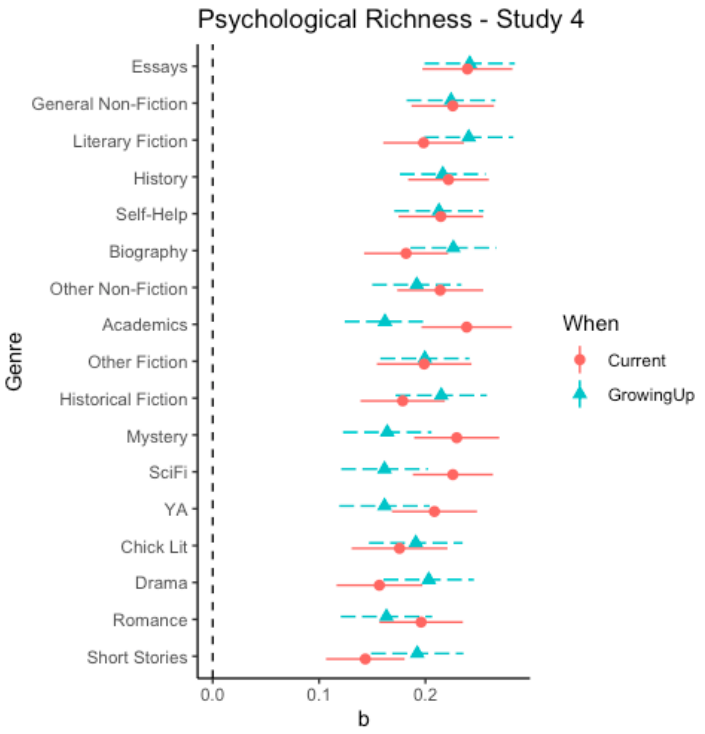
When
Current
GrowingUp


Psychological Richness - Study 4
Essays
General Non-Fiction
Literary Fiction
History
Self-Help
Biography
Other Non-Fiction
Academics
Other Fiction
Historical Fiction
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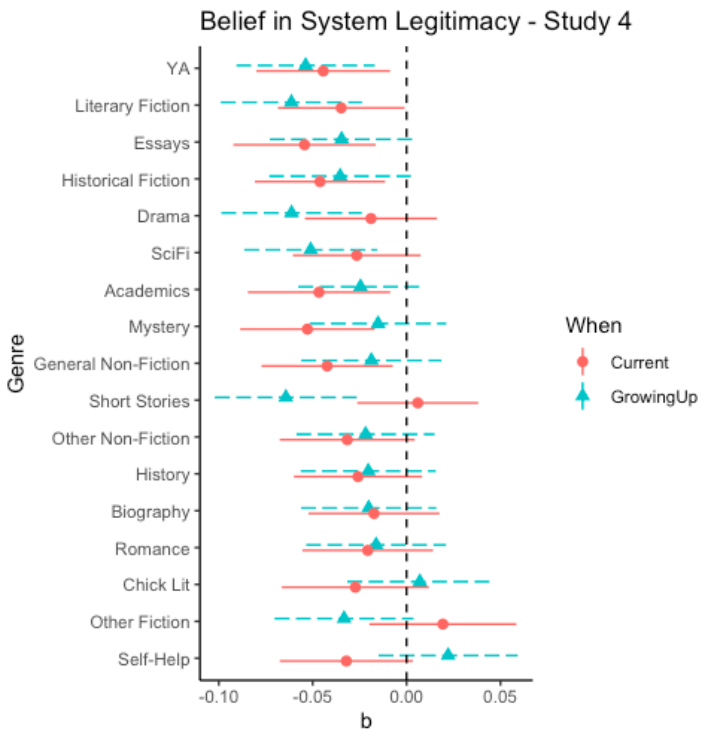
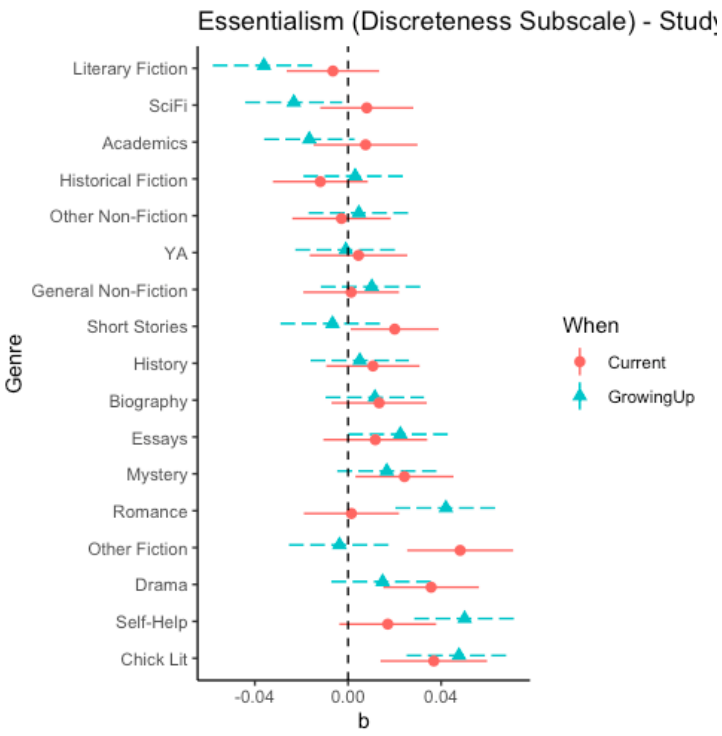

Belief in System Legitimacy - Study 4
YA
Literary Fiction
Essays
Historical Fiction
Drama
SciFi
Academics
Mystery
General Non-Fiction
Short Stories
Other Non-Fiction
History
Biography
Romance
Chick Lit
Other Fiction
Self-Help
Genre
-0.10
-0.05
0.00
0.05
b
When
Current
GrowingUp


Essentialism (Discreteness Subscale) - Study
Literary Fiction
SciFi
Academics
Historical Fiction
Other Non-Fiction
YA
General Non-Fiction
Short Stories
History
Biography
Essays
Mystery
Romance
Other Fiction
Drama
Self-Help
Chick Lit
Genre
-0.04
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b
When
Current
GrowingUp

Figure 7. Attributional complexity, psychological richness, belief in system legitimacy, and essentialism, predicted by the self-reported intensity of reading across genres, both while growing up and currently, with demographic controls.

Note: lines indicate 95% confidence intervals for all estimates.

Exploratory Analyses

In a set of exploratory analyses, we looked at whether reading material predicted intellectual humility and simple certain knowledge (i.e. the belief that knowledge is understood in the same way by all people). We found that increased early-life reading of literary fiction predicted not only increased intellectual humility, $b = 0.20$ [0.16, 0.24], $se = .019$, $t(1020) = 10.74$, $p < .001$, $f^2 = .11$, but also, unexpectedly, predicted increased endorsement of simple certain knowledge, $b = 0.70$ [0.025, 0.11], $se = .023$, $t(1020) = 3.05$, $p = .002$, $f^2 = .0091$. Early-life romance-novel reading similarly predicted increased intellectual humility, $b = 0.12$ [0.081, 0.16], $se = .019$, $t(1021) = 6.20$, $p < .001$, $f^2 = .038$, but also predicted relatively stronger belief in simple certain knowledge, $b = 0.24$ [0.20, 0.28], $se = .021$, $t(1021) = 11.19$, $p < .001$, $f^2 = .12$. See Figure 8 for a graphical representation of the betas for all genres of reading that we asked about.

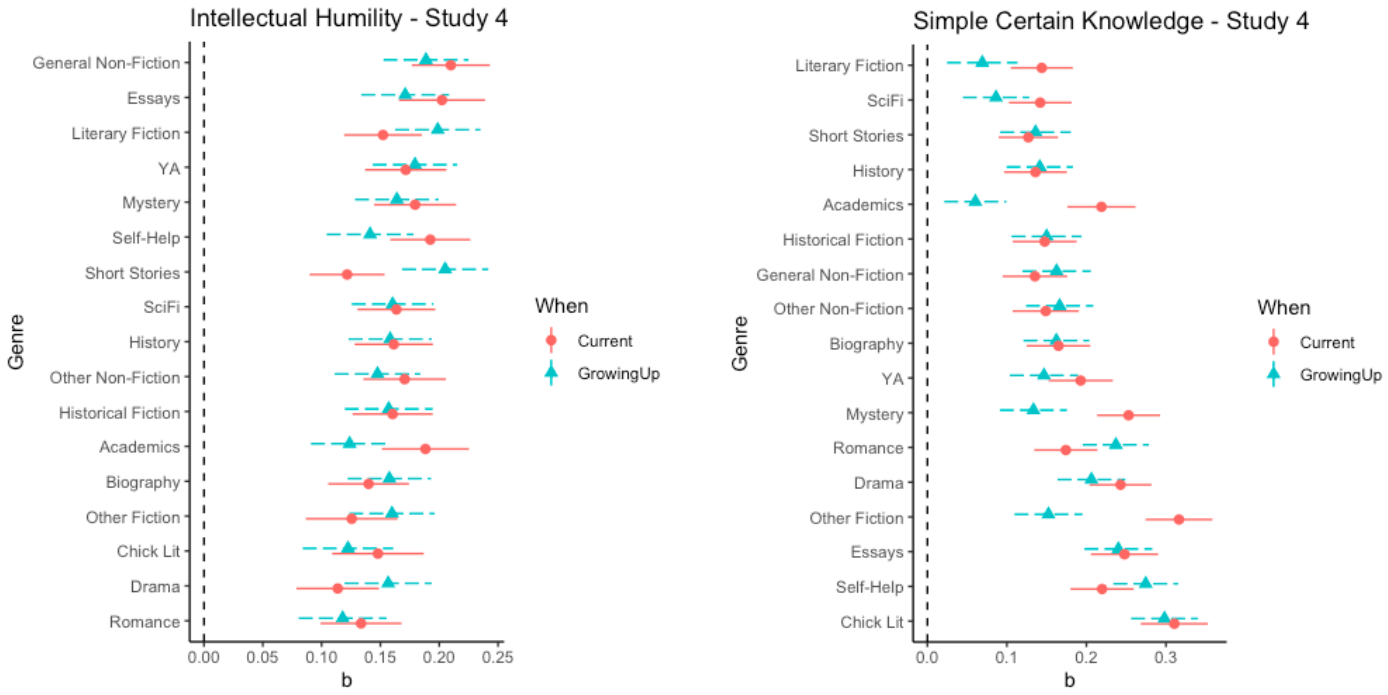

Figure 8. Intellectual humility and simple certain knowledge predicted by the self-reported intensity of reading across genres, both while growing up and currently, with demographic controls.

Note: lines indicate 95% confidence intervals for all estimates.

Finally, as a way of capturing a more holistic sense of a person's worldview complexity, we built latent profiles for our participants, based on their responses to the Attributional Complexity, Psychological Richness, Belief in System Legitimacy, Essentialism, Intellectual Humility and the Simple Certain Knowledge scales. Latent Profile Analysis (LPA) is an exploratory person-centered approach that models patterns of responses within a participant as a function of underlying latent variables across participants, thereby identifying classes of respondents (e.g. Marsh et al., 2009). In so doing, we can capture differences in whole worldviews, not just individual scales. We anticipated that reading literary fiction, especially when young, would predict a complex worldview, one made up of high attributional complexity,

high psychological richness, high intellectual humility; and low belief in system legitimacy, low essentialism, and low simple certain knowledge.

As with exploratory factor analysis, a researcher needs to determine the number of profiles to extract before modelling the latent profile structure of a dataset, and so we initially fit solutions that fit between two and ten potential profiles, selecting the profile solution that best fit the data using a combination of fit indices: the adjusted Bayesian Information Criterion (aBIC), the Vuong-Lo-Mendell-Rubin likelihood ratio test (VLMR), and the percentage of participants in each profile, using 10% of the sample in the smallest profile as a cutoff requirement (see Gaspard et al., 2019 for a similar decision rule). We settled on a three-profile solution[2]; see Figure 9 for a graphical representation of the three profiles.

[2]The next-best-fitting solution, which fit four profiles, shows essentially the same pattern of results - see the SI for profile fit statistics, parameter estimates, and modelling results using the four-profile solution.

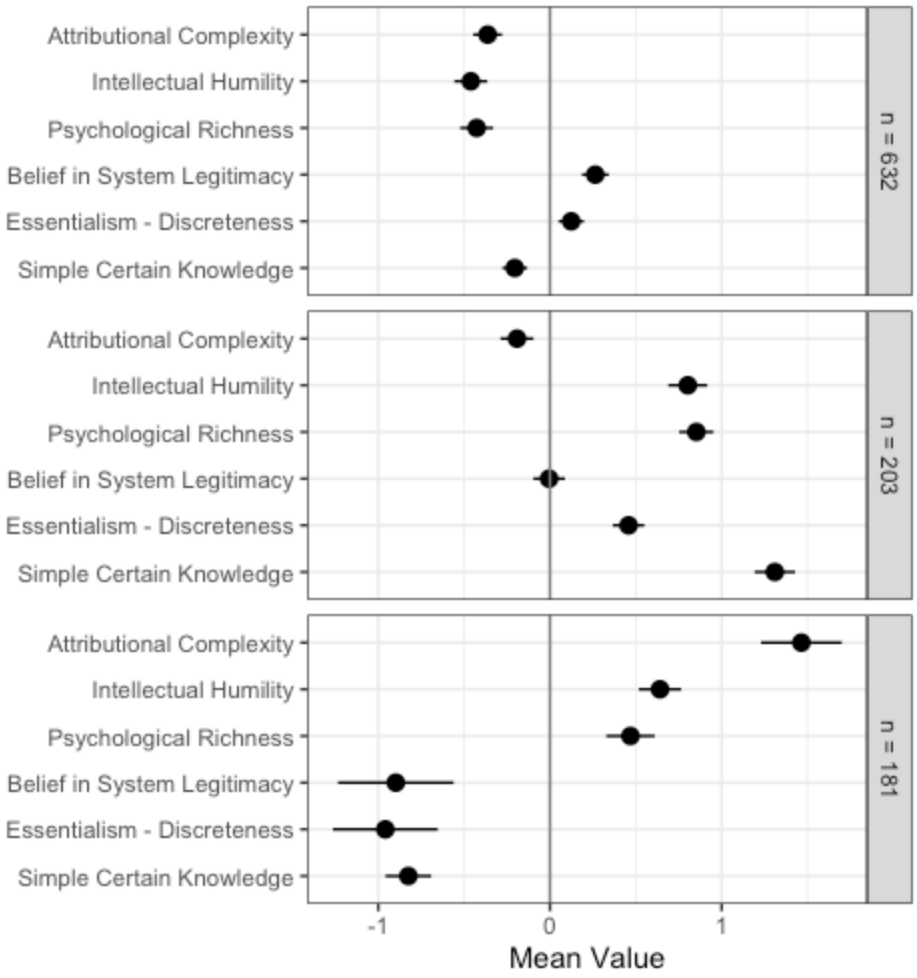

Figure 9. Parameter estimates for the latent-profile solution. Boxes indicate the three different profiles, with parameter estimates for each scale presented as dots. Lines indicate 95% confidence intervals for parameter estimates within profiles.

The bottom profile, containing 181 people (17.8% of the sample) stood out as matching our expectation of a person with a complex worldview. Members of this profile scored relatively high on intellectual humility, psychological richness, and attitudinal complexity; while scoring relatively low on Simple Certain Knowledge, Essentialism, and Belief in System Legitimacy.

We tested whether those who read more literary fiction in early life were more likely to belong to the complex-belief profile, controlling for gender, age, political orientation, SES, income, and parental education. We found that they were: $OR = 1.04$ [1.02, 1.05], $X(1) = 27.50$,

$p < .001$, $n = 1016$. Collapsing across all covariates, a first-quartile amount of early-life fiction reading predicted a 12.2% (median) chance of belonging to the complex worldview profile, a median level of early-life literary fiction reading predicted a 19.5% (median) chance, and a third-quartile amount of early-life literary fiction reading predicted a 24.5% (median) chance. Because 17.8% of the sample as a whole belonged to the complex worldview profile, a third-quartile level of early-life literary-fiction reading predicted a 37.4% increase in belonging to this profile above baseline.

By contrast, current-day reading of literary fiction did not predict membership in this profile, $OR = 1.01$ [0.997, 1.02], $X(1) = 1.94$, $p = .16$, $n = 1016$, and those who read more Romance novels growing up were *less* likely to be a member of this profile, $OR = 0.98$ [0.97, 0.99], $X(1) = 7.90$, $p = .0049$, $n = 1016$. See Figure 10 for the graphical representation of all genres of reading measured, and see https://osf.io/ejdmt/?view_only=986cedb4ee104e62a76af463430a867c for the regression tables

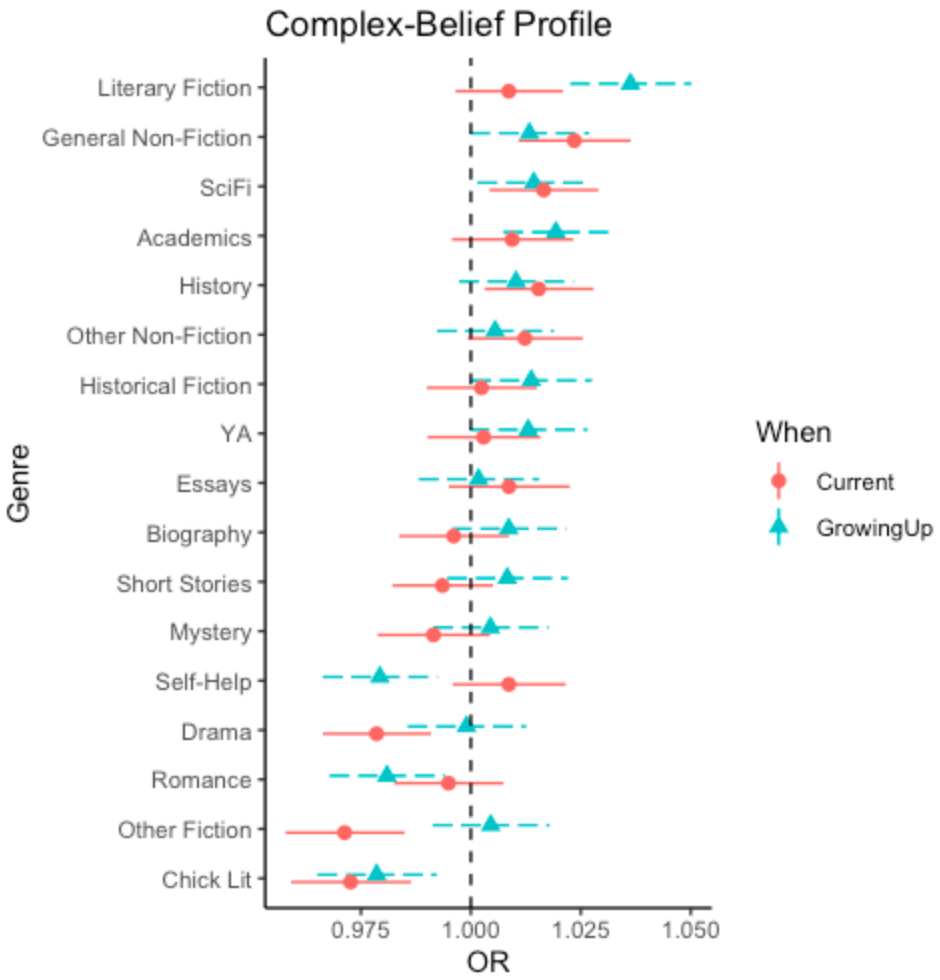

Figure 10. Membership in the complex-belief profile predicted by self-reported intensity of reading across genres, both while growing up and currently, with demographic controls.

Note: lines indicate 95% confidence intervals for all estimates.

General Discussion

Across four studies (total n = 5,176), including one preregistered replication with a nationally-representative sample, we found that greater reading of literary fiction in early life predicted a more complex worldview in the present day among Americans. Specifically, we found that, controlling for age, gender, family income, parental education, political orientation, and perceived socioeconomic status within the US, greater early-life literary-fiction reading repeatedly predicted greater attributional complexity, experiencing more psychological richness

in life, expressing less status-quo-justifying beliefs and holding less essentialist views about other people. Taking a more holistic approach (Study 4), greater early-life reading of literary fiction predicted a pattern of individual belief indicative of a more complex worldview, one made up of high attributional complexity, psychological richness, and intellectual humility; and low essentialism, belief in system legitimacy, and a sense that all knowledge and ways of knowing are, basically, the same thing.

Consistent with previous research (e.g., Dodell-Ferer & Tamir, 2018; Mumper & Gerrig, 2017), we found that almost all kinds of reading were associated with more empathy and perspective-taking. Critically, however, this was not the case for worldview complexity. Counter to theories that suggest that the simple act of mental transportation underlies the beneficial aspects of reading fiction (e.g. Mar & Oatley, 2008), we repeatedly found that early life reading of romance fiction - a genre which includes a transportative narrative structure, but which tends to rely on stock plots and characters - predicted either no difference in worldview complexity or, if anything, a view of the world that was less complex, more essentialist, and less likely to question the existing status-quo. This differential effect is consistent with our argument that literature increases civic engagement primarily by increasing a sense of difference.

We also wish to highlight that current-day reading habits were repeatedly far *less* predictive than the habits of one's youth. While this does not demonstrate causality, of course, this difference suggests that it is far more likely that past reading habits are driving beliefs in the present, than the reverse story in which having more complex worldviews in the present changes what people retrospectively report having read in the past (but not - for some reason - what they are reading in the present). This difference additionally cannot simply be chalked up to college students, as three of our four studies recruited from the general population (mean ages 36.45;

49.84, and 48.81 years, respectively), with similar findings across all samples. Rather, we suspect that this reflects a process in which one's sense of the scope of the social world is more permeable in early life (e.g, Cheung, Chudek, & Heine, 2011), and therefore that literary fiction may have more purchase in shaping worldviews when those views are less settled.

This lack of a reliable relationship between present-day reading habits and worldview complexity may also shed some light on current issues in the study of the relationship between reading and social cognition. Previous psychological work studying the causal impact of reading has typically asked participants to read a short story in the lab, then immediately measures differences in cognition. Just a single study in the meta-analysis of Dodell-Feder & Tamir (2018), for example, asked participants to read so much as a single book. This approach, perhaps inevitably given our current findings, has produced unstable findings, with the same paradigm (e.g. Kidd & Castano, 2013) sometimes replicating (Black & Barnes, 2015), and sometimes failing to replicate (Panero et al., 2016). It may simply be that the relatively small reading-dose administered in these studies is not large enough to overcome a lifetime of experience, especially if one's current reading habits exhibit such a weak relationship with social-cognitive outcomes.

Future work, therefore, we suggest, should focus more on the ways that reading literary fiction, specifically, interacts with a child's development of a social worldview. We also suggest that, should researchers be interested in understanding the causal effect of reading fiction with participants who are themselves old enough to consent, they may wish to provide stronger interventions, providing entire reading curricula, for example, and at least asking readers to engage with more than one fictional work. Aside from one qualitative study (Dowrick, Billington, Robinson, Hamer, & Williams, 2012) and one small longitudinal experiment (Poerio

& Totterdale, 2020), we know of no other researchers who have sought to understand the effects of reading at anything like the level that occurs in the everyday lives of participants.

We note some clear limitations of this current study. All these findings are correlational, of course, and are limited to retrospective self-reports within an American context. While we would expect, given our sampling strategy, that these findings would generalize to Americans more broadly, and to adults in Western cultures more widely, we would not strongly predict that these correlations would hold in cultures that prize other storytelling traditions. Likewise, it is possible that other third variables uncontrolled-for here, such as cognitive ability, might partially account for these correlations; future work should examine and control for such possibilities (though we do note that we still see our pattern of results when restricted, in Study 2, to students at a selective university, and that all of our models control for parental education).

Our self-report strategy additionally opens up the worry that participants may be using different strategies for judging their current reading habits than the reading habits of their youth. Early-life reading may be recalled with less precision, or may be reported with the aid of more general heuristics, than current-day reading. If participants are using different mechanisms to dredge up their reading habits, it may make the interpretation of differences across measures more difficult. We note some features of our experiments that help to minimize these concerns. Firstly, if our participants were using different criteria for reporting on their early-life reading, one might expect that the order in which the two sets of questions were asked would make a difference - if asked about childhood first, participants might anchor on hazy general beliefs or attitudes, and then ignore that anchor when thinking about their specific present-day reading habits; conversely, if asked about the present day first, participants might respond with more

clear, recent, memories, and then anchor on those responses as a guide when judging their past selves.

We therefore counterbalanced the order of these scales (childhood vs current) across several of the studies. In Study 2, we asked participants about their current reading habits first, and then about their youthful ones; while in Studies 3 & 4, we asked about childhood first, and then the present day (in Study 1, of course, we only asked about early-life reading). That we see similar patterns in our relationships across all four studies suggests, at the very least, that a purely anchoring explanation is insufficient to explain our results - no matter whether participants were explicitly thinking about their current reading habits or not, we still find that self-reported childhood reading behavior predicts our relevant outcomes.

Secondly, one may worry that, due to the difficulty of the task, different people are using different strategies when attempting to recall their past reading behavior. If this were the case, one would expect that ratings of childhood reading would be quite a bit noisier than ratings of current-day reading (which, due to temporal proximity, would be recalled more precisely). In that case, then, one would expect, statistically-speaking, that the more precise measure would do a better job of predicting outcomes than the more diffuse one, due to a greater signal-to-noise ratio. That we find otherwise, with childhood reading behavior a more potent predictor than present-day reading suggests at least some regularity (i.e., signal) in our participants' recall.

We also allowed readers to characterize their reading material according to their subjective sense of category - the very same book could be categorized as literary fiction by one reader, as science fiction by another, and as Young Adult by a third. While this obscures the relationship between particular books and particular worldviews, it also allows us to get a

holistic sense of reading patterns without requiring participants to generate lists of books read decades ago, a task which we suspect is impossible for the majority of people.

In providing capacious labels we have likely obscured important differences within genres that may speak to our hypotheses. We would expect that any reading experience that forces the reader to grapple with difference (e.g., by sketching rich inner lives and complex settings) should lead to a greater sense of complexity in the world. While we expect that those features are more likely to appear in 'literary fiction', there is nothing to say other genres of reading do not regularly fill that brief. For example, we suspect that reading 'soft' science fiction (which focuses on how characters exist in novel settings, as opposed to 'hard' science fiction which places more emphasis on the mechanics of the new setting itself, see e.g. Wilde, 2017) should have similar effects as reading literary fiction. In these studies, we use genre as a shorthand. As researchers move to a better understanding of the causal mechanisms (as opposed to to the merely correlational), far more care should be taken in isolating the specific elements of narrative fiction that work to create broader worldviews. Future work that looks at actual logs of material read, ideally across an entire lifetime, and matches that reading material with the development of the Liberal Imagination will be a difficult but necessary step in fully unpacking the causal relationship between reading and a sense of the world as a complex place.

Living in a democracy requires that we forge society from the differences that all citizens bring. Through the repeated experience of variety, possibility, complexity, and difficulty, we argue that reading literary fiction is an important tool in the reaffirming of a proper liberal imagination.

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Online Supplemental Materials for "Building the Liberal Imagination: Reading literary fiction is associated with a more complex worldview"

This Online Supplement contains the following information

Description of the additional scales in Study 2

In addition to the scales listed in the main text, we additionally analyzed the relationship between reading and Intolerance of Uncertainty, a five-item scale adapted from Carleton, Norton, & Asmundson (2017), alpha = .80 [.78, .81], sample item: "When I am uncertain I can't function very well"; and Locus of Control (Sapp & Harrold, 1993), a nine-item scale, alpha = .77 [.76, .78], sample item: "My life is determined by my own actions."

See https://osf.io/ejdmt/?view_only=986cedb4ee104e62a76af463430a867c for the relevant regression tables

Description of the additional scales in Study 3

In addition to the scales listed in the main text, we additionally analyzed the relationship between reading and Need for Cognitive Closure (Roets & van Hiel 2011), a 15-item scale, alpha = .75 [.75, .75], sample item: "I enjoy having a clear and structured mode of life."; interpersonal victim-blaming (Savani, Stephens & Markus, 2011), a six-vignette scale, alpha = .67 [.65, .69], sample vignette "John grew up in a poor family in an urban neighborhood in a metropolitan city. Neither of his parents completed high school and they both worked at minimum wage jobs. John attended a high school that was under-funded and John did not find the school environment engaging. After trying to "stick it out" for a few years, John's grades declined severely and he dropped out of high school."; and whether, when faced with injustice, the degree, on a 0-100 scale, that participants reported feeling sad (M = 57.76, SD = 27.25), feeling angry (M = 57.74, SD = 28.71), feeling fearful, (M = 36.76, SD = 29.11), and feeling guilty (M = 29.14, SD = 28.25).

See https://osf.io/ejdmt/?view_only=986cedb4ee104e62a76af463430a867c for the relevant regression tables.

Correlations between all measures

Study 1

Means, standard deviations, and correlations with confidence intervals

Variable	*M*	*SD*	1
1. Attributional Complexity	4.80	0.87	
2. Psychological Richness	4.90	1.10	.35** [.25, .43]

Note. *M* and *SD* are used to represent mean and standard deviation, respectively. Values in square brackets indicate the 95% confidence interval for each correlation. * indicates $p < .05$. ** indicates $p < .01$.

Study 2

Means, standard deviations, and correlations with confidence intervals

Variable	*M*	*SD*	1	2	3	4	5
1. Belief in System Legitimacy	3.05	1.18					
2. Belief in a Just World	3.86	1.11	.33**				
			[.28, .37]				
3. Protestant Work Ethic	3.54	1.08	.31**	.48**			
			[.27, .36]	[.45, .52]			
4. Belief in Individual Mobility	3.27	1.17	.54**	.38**	.47**		
			[.51, .58]	[.34, .42]	[.43, .51]		
5. Intolerance of Uncertainty	3.40	0.79	-.05*	.01	-.08**	-.10**	
			[-.10, -.00]	[-.04, .06]	[-.13, -.03]	[-.15, -.05]	
6. Locus of Control	4.93	0.80	.08**	.17**	.26**	.22**	-.20**
			[.03, .13]	[.12, .22]	[.21, .30]	[.17, .26]	[-.25, -.15]

Note. *M* and *SD* are used to represent mean and standard deviation, respectively. Values in square brackets indicate the 95% confidence interval for each correlation. * indicates $p < .05$. ** indicates $p < .01$.

Study 3

Means, standard deviations, and correlations with confidence intervals

Variable	*M*	*SD*	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
1. Belief in System Legitimacy	15.56	4.87															
2. Belief in a Just World	15.45	5.22	.35** [.31, .39]														
3. Protestant Work Ethic	14.83	4.69	.46** [.42, .50]	.54** [.50, .57]													
4. Belief in Individual Mobility	16.00	4.90	.61** [.58, .64]	.41** [.37, .45]	.63** [.60, .66]												
5. Essentialism - Discreteness	38.56	5.31	.16** [.11, .20]	.38** [.33, .42]	.28** [.23, .32]	.15** [.10, .20]											

6. Essentialism - Biological	31.42	6.96	-.02 [-.07, .04]	.11** [.06, .16]	.07** [.02, .12]	.02 [-.03, .07]	.27** [.22, .31]									
7. Essentialism - Informativeness	27.51	5.01	.16** [.11, .21]	.24** [.19, .29]	.21** [.16, .26]	.14** [.09, .19]	.51** [.47, .54]	.32** [.28, .37]								
8. IRI - Empathic	26.18	5.03	-.27** [-.31, -.22]	-.18** [-.23, -.13]	-.02 [-.07, .03]	-.09** [-.14, -.04]	-.10** [-.15, -.05]	.06* [.01, .11]	-.04 [-.09, .01]							
9. IRI - Perspective-Taking	23.90	3.67	-.11** [-.16, -.06]	.12** [.07, .17]	.07** [.02, .12]	.00 [-.05, .05]	-.04 [-.09, .01]	.04 [-.01, .09]	.02 [-.03, .07]	.44** [.40, .48]						
10. IRI - Fantasy	18.98	4.80	-.20** [-.25, -.15]	-.06* [-.11, -.01]	-.06* [-.11, -.01]	-.11** [-.15, -.05]	-.07** [-.12, -.02]	.06* [.01, .11]	.02 [-.03, .07]	.34** [.29, .38]	.33** [.28, .37]					

11. Need for Cognitive Closure	61.71	10.64	.02 [-.03, .07]	.18** [.13, .23]	.07** [.02, .12]	.03 [-.02, .08]	.29** [.24, .33]	.11** [.06, .16]	.15** [.10, .20]	.04 [-.01, .09]	-.01 [-.06, .05]	.04 [-.01, .09]				
12. Victim Blaming	28.40	5.63	.29** [.25, .34]	.28** [.24, .33]	.21** [.16, .26]	.27** [.22, .32]	.20** [.15, .24]	.03 [-.02, .08]	.10** [.05, .15]	-.12** [-.17, -.07]	.01 [-.04, .06]	-.11** [-.16, -.06]	.14** [.09, .19]			
13. Injustice - Sadness	57.41	27.18	-.32** [-.37, -.28]	-.14** [-.18, -.09]	-.13** [-.18, -.08]	-.20** [-.24, -.15]	-.03 [-.08, .02]	.11** [.06, .16]	.01 [-.04, .06]	.43** [.39, .47]	.22** [.18, .27]	.29** [.24, .33]	.14** [.09, .19]	-.13** [-.18, -.08]		
14. Injustice - Anger	57.46	28.85	-.30** [-.34, -.25]	-.14** [-.19, -.09]	-.16** [-.21, -.11]	-.23** [-.27, -.18]	-.05 [-.10, .00]	.07** [.02, .12]	-.00 [-.06, .05]	.26** [.21, .30]	.11** [.06, .16]	.24** [.19, .28]	.13** [.08, .18]	-.10** [-.15, -.05]	.57** [.54, .60]	
15. Injustice - Fear	33.68	27.92	-.20** [-.25, -.15]	-.00 [-.05, .05]	-.07** [-.12, -.02]	-.13** [-.18, -.08]	.10** [.05, .15]	.15** [.10, .19]	.03 [-.02, .08]	.20** [.15, .25]	.16** [.11, .21]	.19** [.15, .24]	.14** [.09, .19]	-.06* [-.11, -.01]	.44** [.40, .48]	.42** [.38, .46]
16. Injustice - Guilt	25.25	25.78	-.17**	.09**	-.02	-.09**	.11**	.10**	.05*	.10**	.14**	.19**	.11**	-.06*	.34**	.32**	.63**

		[-.22, -.12]	[.04, .14]	[-.07, .03]	[-.14, -.04]	[.06, .16]	[.05, .15]	[.00, .10]	[.05, .15]	[.09, .19]	[.14, .23]	[.06, .16]	[-.11, -.01]	[.29, .38]	[.27, .36]	[.60, .66]	

Note. *M* and *SD* are used to represent mean and standard deviation, respectively. Values in square brackets indicate the 95% confidence interval for each correlation. * indicates $p < .05$. ** indicates $p < .01$.

Study 4

Means, standard deviations, and correlations with confidence intervals

Variable	*M*	*SD*	1	2	3	4	5
1. Belief in System Legitimacy	17.87	1.19					
2. Essentialism - Discreteness	3.79	0.61	.26**				
			[.20, .31]				
3. Attributional Complexity	4.29	0.74	-.39**	-.28**			
			[-.44, -.33]	[-.33, -.22]			
4. Psychological Richness	4.83	1.29	-.05	-.04	.26**		
			[-.11, .01]	[-.10, .02]	[.21, .32]		
5. Intellectual Humility	5.14	1.08	-.22**	-.12**	.33**	.48**	
			[-.28, -.16]	[-.18, -.06]	[.27, .38]	[.43, .53]	
6. Simple Certain Knowledge	3.59	1.34	.01	.33**	-.21**	.25**	.20**
			[-.05, .07]	[.28, .39]	[-.27, -.15]	[.19, .31]	[.14, .26]

Note. *M* and *SD* are used to represent mean and standard deviation, respectively. Values in square brackets indicate the 95% confidence interval for each correlation. * indicates $p < .05$. ** indicates $p < .01$.

Distribution of reading intensity across studies

Study 1

Reading Type	n	Pct of Total Respondents	Mean	SD	Median	Distribution
Literary Fiction	409	1	4.37	1.79	5	
SciFi	409	1	4.12	1.91	4	
Historical Fiction	409	1	3.69	1.78	4	
Romance	409	1	3.08	1.89	3	
Drama	409	1	3.54	1.9	3	
Mystery	409	1	4.16	1.78	4	
Short Stories	409	1	4.29	1.63	4	
YA	409	1	4.11	1.96	4	
Chick Lit	409	1	2.52	1.86	2	
Other Fiction	409	1	3.85	1.8	4	
Biography	409	1	3.57	1.78	4	
History	409	1	3.67	1.82	4	
General Non-Fiction	409	1	3.98	1.68	4	
Essays	409	1	2.94	1.76	2	
Self-Help	409	1	3.05	1.81	3	
Academics	409	1	3.91	1.88	4	
Other Non-Fiction	409	1	3.52	1.72	4	

Study 2

Reading Type	When	n	Pct of Total Respondents	Mean	SD	Median	Distribution
Literary Fiction	Current	1790	0.798	3.34	1.67	3	
Biography	Current	1790	0.798	2.3	1.4	2	
SciFi	Current	1790	0.798	2.73	1.63	2	
Historical Fiction	Current	1780	0.796	2.41	1.44	2	
Romance	Current	1790	0.798	2.75	1.68	2	

Drama	Current	1790	0.797	2.31	1.48	2	
Mystery	Current	1790	0.798	2.73	1.58	2	
Short Stories	Current	1780	0.796	2.7	1.52	2	
YA	Current	1790	0.798	3.01	1.7	3	
Chick Lit	Current	1790	0.797	1.86	1.33	1	
Other Fiction	Current	1780	0.793	2.51	1.51	2	
History	Current	1790	0.798	2.39	1.5	2	
General Non-Fiction	Current	1790	0.797	2.72	1.66	2	
Essays	Current	1790	0.798	2.74	1.69	2	
Self-Help	Current	1780	0.792	2.27	1.53	2	
Academics	Current	1790	0.798	4.44	1.91	5	
Other Non-Fiction	Current	1770	0.79	2.28	1.47	2	
Literary Fiction	Growing Up	1780	0.792	4.59	1.83	5	
Biography	Growing Up	1780	0.794	2.4	1.42	2	
SciFi	Growing Up	1780	0.794	4.21	1.88	5	
Historical Fiction	Growing Up	1780	0.792	3.09	1.77	3	
Romance	Growing Up	1780	0.793	2.78	1.82	2	
Drama	Growing Up	1780	0.794	2.37	1.49	2	
Mystery	Growing Up	1780	0.793	4.01	1.79	4	
Short Stories	Growing Up	1780	0.794	3.35	1.76	3	
YA	Growing Up	1780	0.795	4.27	2	5	
Chick Lit	Growing Up	1780	0.791	2.04	1.56	1	
Other Fiction	Growing Up	1780	0.793	3.26	1.92	3	
History	Growing Up	1780	0.795	2.38	1.5	2	
General Non-Fiction	Growing Up	1780	0.793	2.39	1.47	2	
Essays	Growing Up	1780	0.793	1.85	1.25	1	
Self-Help	Growing Up	1780	0.793	1.58	1.06	1	
Academics	Growing Up	1780	0.794	2.57	1.74	2	

Other Non-Fiction	Growing Up	1770	0.79	1.94	1.29	1	

Study 3

Reading Type	When	n	Pct of Total Respondents	Mean	SD	Median	Distribution
Literary Fiction	Growing Up	1510	0.999	3.47	1.77	3	
SciFi	Growing Up	1510	0.997	2.82	1.76	2	
Historical Fiction	Growing Up	1510	0.998	3.03	1.66	3	
Romance	Growing Up	1510	0.996	2.47	1.73	2	
Drama	Growing Up	1510	0.997	2.7	1.6	2	
Mystery	Growing Up	1510	0.996	3.52	1.79	3	
Short Stories	Growing Up	1510	0.995	3.59	1.61	4	
YA	Growing Up	1500	0.993	3.27	1.72	3	
Chick Lit	Growing Up	1510	0.997	1.91	1.44	1	
Other Fiction	Growing Up	1500	0.992	2.86	1.64	3	
Biography	Growing Up	1510	0.995	3.14	1.69	3	
History	Growing Up	1500	0.99	3.35	1.78	3	
General Non-Fiction	Growing Up	1500	0.994	3.1	1.58	3	
Essays	Growing Up	1510	0.998	2.15	1.41	2	
Self-Help	Growing Up	1510	0.997	2.06	1.46	1	
Academics	Growing Up	1510	0.998	3.39	2.01	3	
Other Non-Fiction	Growing Up	1510	0.997	2.66	1.57	2	
Literary Fiction	Current	1510	1	2.7	1.79	2	
SciFi	Current	1510	0.999	2.77	1.75	2	
Historical Fiction	Current	1510	1	2.38	1.74	2	
Romance	Current	1510	0.999	2.56	1.72	2	
Drama	Current	1510	0.999	2.29	1.71	1	
Mystery	Current	1510	0.999	2.13	1.51	1	
Short Stories	Current	1510	0.999	3.05	1.94	3	

YA	Current	1510	0.999	2.51	1.6	2	
Chick Lit	Current	1510	1	1.87	1.4	1	
Other Fiction	Current	1510	1	1.71	1.35	1	
Biography	Current	1510	0.999	2.45	1.63	2	
History	Current	1510	0.999	2.77	1.8	2	
General Non-Fiction	Current	1510	1	2.76	1.71	2	
Essays	Current	1510	1	1.89	1.39	1	
Self-Help	Current	1510	1	2.31	1.64	2	
Academics	Current	1510	1	1.94	1.46	1	
Other Non-Fiction	Current	1510	1	2.38	1.6	2	

Study 4

Reading Type	When	n	Pct of Total Respondents	Mean	SD	Median	Distribution
Literary Fiction	Growing Up	1050	0.997	3.8	1.76	4	
SciFi	Growing Up	1050	0.997	3.39	1.92	3	
Historical Fiction	Growing Up	1040	0.994	3.45	1.75	3	
Romance	Growing Up	1050	0.998	2.82	1.9	2	
Drama	Growing Up	1050	0.997	3.19	1.82	3	
Mystery	Growing Up	1050	0.997	3.71	1.8	4	
Short Stories	Growing Up	1050	0.996	3.95	1.71	4	
YA	Growing Up	1050	0.997	3.6	1.83	4	
Chick Lit	Growing Up	1050	0.997	2.44	1.89	1	
Other Fiction	Growing Up	1050	0.997	3.32	1.8	3	
Biography	Growing Up	1050	0.998	3.6	1.84	4	
History	Growing Up	1050	0.996	3.81	1.85	4	
General Non-Fiction	Growing Up	1050	0.997	3.52	1.78	4	
Essays	Growing Up	1050	0.997	2.85	1.83	2	
Self-Help	Growing Up	1050	0.996	2.69	1.88	2	

Academics	Growing Up	1050	0.997	3.9	1.99	4	
Other Non-Fiction	Growing Up	1050	0.997	3.19	1.82	3	
Literary Fiction	Current	1050	0.997	3.23	1.99	3	
SciFi	Current	1050	0.997	3.33	1.95	3	
Historical Fiction	Current	1050	0.998	2.98	1.97	2	
Romance	Current	1050	0.996	3.09	1.92	3	
Drama	Current	1050	0.997	2.8	1.99	2	
Mystery	Current	1050	0.997	2.74	1.93	2	
Short Stories	Current	1050	0.997	3.43	2.03	3	
YA	Current	1050	0.996	3.11	1.89	3	
Chick Lit	Current	1050	0.997	2.51	1.91	2	
Other Fiction	Current	1050	0.997	2.3	1.86	1	
Biography	Current	1040	0.995	3.02	1.92	3	
History	Current	1050	0.997	3.35	1.97	3	
General Non-Fiction	Current	1050	0.996	3.31	1.91	3	
Essays	Current	1050	0.997	2.63	1.88	2	
Self-Help	Current	1050	0.997	2.91	1.96	2	
Academics	Current	1050	0.998	2.64	1.92	2	
Other Non-Fiction	Current	1050	0.997	2.93	1.87	3	

Zero-order correlations between reading intensity and outcome measures

For tables that contain zero-order correlations for the relationship between reading intensity and outcome measures across all studies, see https://osf.io/su2jd/?view_only=045a1206e00c44b1b85e16417c504b84

Profile fit statistics for Study 4

Table S1

Latent Profile Fit Statistics, Study 4

Classes	Parameters	LL	AIC	BIC	aBIC	Entropy	Proportion in the Smallest Class
2	19	-8321.941	16681.882	16775.431	16715.086	0.899	0.13583
3	26	-8088.238	16228.477	16356.491	16273.913	0.820	0.17815
4	33	-7998.818	16063.636	16226.116	16121.305	0.849	0.03642
5	40	-7928.207	15936.413	16133.359	16006.315	0.828	0.03543
6	47	-7850.325	15794.65	16026.06	15876.784	0.813	0.02953
7	54	-7778.649	15665.298	15931.174	15759.665	0.840	0.02559
8	61	-7740.813	15603.626	15903.968	15710.226	0.857	0.01575
9	68	-7704.975	15545.95	15880.757	15664.783	0.844	0.01575
10	75	-7682.188	15514.376	15883.648	15645.442	0.857	0.01575

Note: LL = Log-likelihood, AIC = Akaike Information Criterion, BIC = Bayesian Information Criterion, aBIC = Adjusted Bayesian Information Criterion

Four-profile solution for Study 4

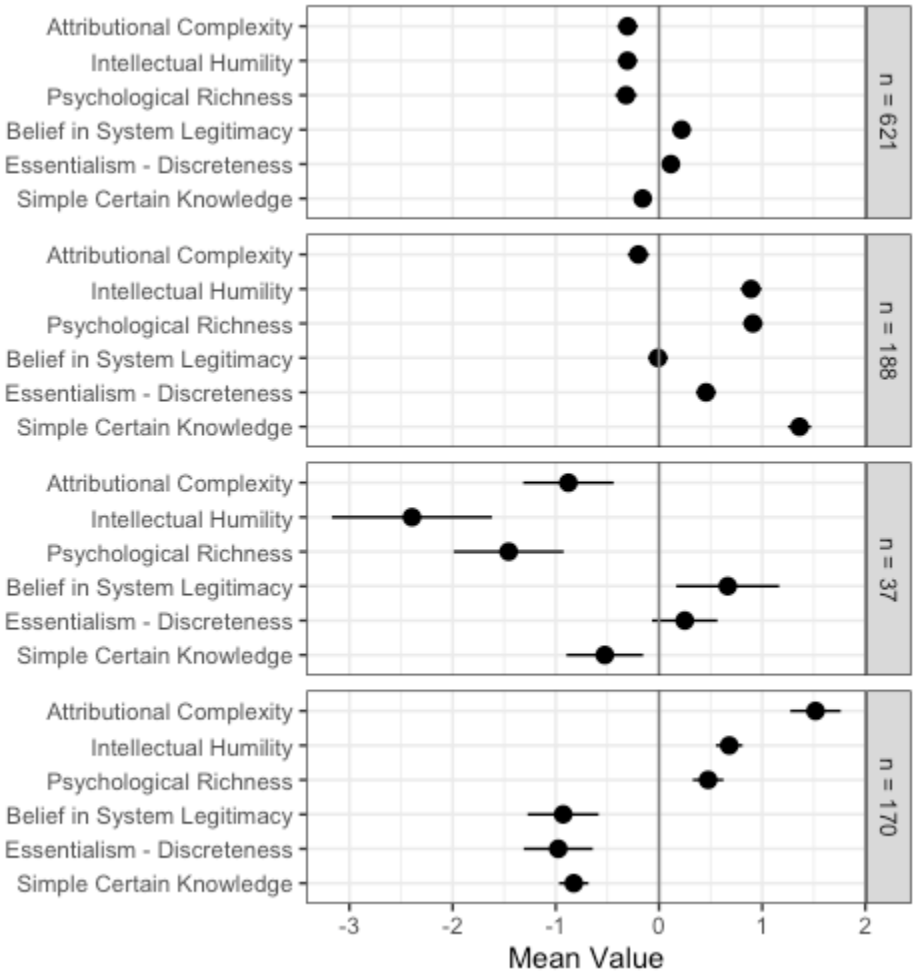

Figure S1. Parameter estimates for the four-latent-profile solution. Lines indicate 95% confidence intervals.

Using the 4-profile solution, we again find that, controlling for gender, age, political orientation, SES, income, and parental education, early-life reading of literary fiction predicts membership in the complex-belief profile: OR = 1.04 [1.02, 1.05], $X(1) = 27.47$, $p < .001$, $n = 1016$; while current-day reading of literary fiction does not: OR = 1.01 [0.997, 1.02], $X(1) = 1.93$, $p = .16$, $n = 1016$. See https://osf.io/ejdmt/?view_only=986cedb4ee104e62a76af463430a867c for all regression tables.

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