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The Imaginative Engagement Scale: Development of an Instrument to Assess Cognitive Elements of Engaging with Fiction

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ABSTRACT

Prior research has focused on individual differences in how readers engage with narratives; however, much of this work has focused a tendency to become immersed or swept up in narratives. The purpose of the four studies reported here was to develop and validate a self-report measure tapping individual differences in a tendency to step back to think or imagine while engaging with narratives. The resulting trait Imaginative Engagement Scale (IES) contains four subscales (Coauthoring, Gap-Filling, Theory of Mind, and Reflection) and correlated with Transportability, Narrative Engageability, and Parasociability, as well as measures of media consumption. Across two studies, IES scores were more strongly related to Need for Cognition than existing measures, and no gender differences were found on the IES. In a final study, IES scores predicted story rating of and state transportation into a popular fiction story, over and above the variance explained by trait Transportability.

Much research has attempted to capture individual differences in the ways that audiences engage with narratives. Constructs such as transportability, or the tendency to become immersed in narratives (Dal Cin, Zanna, & Fong, 2004; Green, 1996) and narrative engageability, or the tendency to connect to and become engaged with stories (Bilandzic, Sukalla, Schnell, Hastall, & Busselle, 2019) have been conceptualized as dispositional traits related to narrative engagement. Prior research validates that these traits indeed moderate the impact of narrative engagement (Bilandzic et al., 2019; Mazzocco, Green, Sasota, & Jones, 2010). However, such research has focused heavily on the experience of becoming swept up in a narrative and largely overlooks ways in which the audience may engage with narratives by taking a step back to think, imagine, reflect, personalize, elaborate on, resist, or otherwise play with the story at hand. Barnes (2018) characterized "imaginative engagement" as the degree to which readers coauthor the text along with the writer, filling in blanks, imagining the complex inner lives of the characters, and reflecting on what they have read. The purpose of the current studies was to facilitate the investigation of dispositional imaginative engagement by developing a valid psychometric instrument to assess individual differences in the construct. The Imaginative Engagement Scale (IES) was hypothesized to be more strongly related to need for cognition (Cacioppo & Petty, 1982) than established scales that are more focused on immersion – particularly emotional immersion – in stories.

Measuring Narrative Engagement

A significant proportion of prior research on narrative engagement has assessed the state level, describing the engagement of a reader with a particular text at a particular time. Among the most used of these measures is the Transportation Scale (Green & Brock, 2000). Transportation is defined as

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Supplemental data for this article can be accessed on the publisher's website

absorption into a story, entailing imagery, affect, and attentional focus, reflecting emotional, cognitive, and imagery immersion in a story (Green, Brock, & Kaufman, 2004). Trait-level transportability has been defined as the dispositional tendency to become absorbed in narratives. An adaptation of the Transportation Scale, the Transportability Scale (TS; Dal Cin et al., 2004; Green, 1996) asks participants to self-report whether they tend to become immersed in stories, with items such as "I can become so absorbed in a story that I forget the world around me" and "I am often emotionally affected by the stories I watch or read." Trait transportability predicts state transportation (Dal Cin et al., 2004; Mazzocco et al., 2010), as well as the strength of parasocial interaction with favorite fictional characters (Black, Oberstein-Allen, & Barnes, 2019; Greenwood & Long, 2009) and the tendency to ponder a story after reading (Slater, Ewoldsen, & Woods, 2018).

Bilandzic et al. (2019) argued that Transportability fails to capture the multidimensional nature of narrative engagement. To address this, they created the Narrative Engageability Scale (NES), composed of four subscales designed to capture individual differences in distinct dimensions of narrative engagement: Propensity for Curiosity and Suspense, Propensity for Emotional Engagement, Propensity to Experience Narrative Presence, and Ease of Accepting Unrealism. Bilandzic and colleagues found that the subscales were strongly correlated with Transportability (*r*s between .81 and .88), and composite Narrative Engageability scores were nearly perfectly correlated to Transportability ($r = .99$). Both overall Narrative Engageability scores and three of the four subscales (all but Ease of Accepting Unrealism) were also related to a range of emotion-related traits, including need for affect, sympathy, and empathy.

That both Narrative Engageability and Transportability are related to Affect (Bilandzic et al., 2019; Rosenbaum & Johnson, 2016) is unsurprising, given that both scales contain items related specifically to emotional absorption, such as "I find myself feeling what the characters may feel" (TS) and "It is easy for me to get involved with the feelings of a character in a movie" (NES). Notably, however, the NES and TS also have items geared to measure cognitive involvement in narratives, such as "I get mentally involved in the story" (TS) and "Films arouse my curiosity easily" (NES), as well as items intended to tap narrative presence, or the feeling that they are part of the story world. As a whole, these measures both tap the overall propensity for becoming immersed in narratives, which includes at least some focus on cognitive as well as emotional immersion. Not surprisingly, then, trait Transportability is also related to Cognition (e.g., Shakarchi & Haugtvedt, 2004), though the relationship tends to be somewhat weaker than the relationship between Transportability and Affect (Rosenbaum & Johnson, 2016).

Notably, however, because individuals who are high on Need for Cognition enjoy thinking abstractly and are drawn to cognitive challenges and puzzling over things (Cacioppo, Petty, & Kao, 1984), they may tend to engage with stories in a way that goes beyond simply becoming cognitively immersed in the narrative. Indeed, some ways in which readers engage with stories may require slowing down or taking a step back from the narrative to puzzle over, personalize, or play with the material. This is the focus of the current research.

Prior research has found gender differences in existing measures of narrative engagement: women are higher in transportability (Black et al., 2019), tend to form stronger parasocial relationships (Cohen, 2004), and score higher in fantasy empathy (Davis, 1980) than men. This raises an interesting question: might there be some aspects of narrative engagement that men are just as prone to as women? Given that some research has shown less of a gender difference in need for cognition than need for affect (de Bruijn, Keer, van Den Putte, & Neijens, 2012), one possibility is that a narrative measure that focuses less on a tendency to become swept up in a story and more on a tendency to use the narrative as a source of cognitive challenge may be less likely to reflect gender differences.

Imaginative Engagement

Barnes (2018) defined imaginative engagement as "the extent to which a reader contributes imaginatively and creatively to a text by filling in gaps, puzzling over interpretations, fleshing out what is written, or otherwise imputing meaning onto the page that extends beyond what is written"

(p. 3). Although Barnes (2018) focused largely on the extent to which different kinds of stories (i.e. literary versus popular fiction) may require this kind of input from the audience, our focus here is on the idea that some individuals may be more prone to engaging in extensive thinking and imagining while consuming narratives. Thus, for the purposes of these studies, we are not focused on acts of imaginative engagement (state), but rather, on the idea that some individuals may be predisposed toward playing with, fleshing out, subverting, or personalizing the stories they consume (trait).

The Imaginative Engagement Scale focuses on a dispositional tendency to engage in four types of imaginative engagement proposed by Barnes (2018):

Coauthoring refers to adopting a "writerly perspective," wherein one co-creates alongside the author. It has long been noted that reading is a participatory activity, allowing for different readers to experience the same text in vastly different ways (Gerrig, 1993). No reader ever truly passively consumes fiction, but some individuals may be more prone to dedicating significant mental energy to interpreting subtext, theorizing about a character's backstory, imagining counterfactual scenarios in-text, or resisting declarations made by the author. Notably, coauthoring while reading can be seen as conceptually at odds with concepts such as absorption (Kuijpers, Hakemulder, Tan, & Doicaru, 2014), transportation (Green & Brock, 2000), or narrative presence (Bilandzic & Busselle, 2011), which involve becoming immersed in a narrative as if one were a part of the story world. Coauthoring, in contrast, positions the reader as a *creator* of the story. An obvious example of this phenomenon is the writing of fanfiction, where the reader literally authors an extension, re-imagining, or subversion of the source text. It also has been suggested that readers may engage in somewhat similar, but entirely mental coauthoring while reading (Barnes, 2018). Consider, for example, the different ways that one could approach the death of a significant character in the middle of story. Many readers may accept that the character is dead, but some may construct theories that the character somehow faked their death, whereas others may accept that the character *is* dead in the text, but think about how that death could have been prevented. Similarly, individuals who are highly invested in two characters becoming a romantic couple (Scodari & Felder, 2000) may devote cognitive and creative effort to imagining the alternate universe in which, for example, an almost kiss *was* a kiss.

Gap-filling involves imaginatively filling in narrative gaps (Barnes, 2018); whereas coauthoring is entirely free of (and sometimes purposefully contrary to) the intentions of the author, gap-filling addresses elements of the story purposefully left open, unspecified, or vague by the author. Routine gap-filling may be no more than inference-making that facilitates understanding of characters' motivations, the causal chain of events in the story, and the story's global point (see Graesser, Singer, & Trabasso, 1994, for discussion of inference-making); however, some individuals may be prone to theorizing about, imagining, and filling in these narrative gaps in a way that goes beyond that necessary to aid in narrative comprehension. All readers construct a mental model of the narrative, supplying details not found in the text itself in order to generate a cohesive whole (Gerrig, 1993), but some readers may devote more time and effort to filling in gaps that are causally unimportant to the story. For example, if a character has a scar and the narrative highlights the mysteriousness of how the scar was obtained, but does not provide an answer (a narrative gap), a reader engaged in gap-filling may imagine different possibilities for how the character obtained that scar. Thus, a dispositional tendency toward narrative gap-filling not only suggests a higher tolerance of narrative ambiguities, but also a tendency to cognitively and imaginatively engage with them, often for the sheer pleasure of doing so.

Reflection refers to taking time to reflect on and search for meaning in stories. Koopman and Hakemulder (2015) suggested that reflection happens when the narrative evokes in the reader the kind of mental stillness necessary to contemplate the meaning of the text and its relationship to oneself. Thus, reflection is characterized as a form of meaning-making that involves slowing down to ponder a story, either with respect to a theme or meaning inherent in the story, or in terms of drawing meaningful connections between the story and oneself (Barnes, 2018). Prior research has investigated the act of relating a narrative to oneself under a wide array of terms, including ego-involvement, self-

referencing, personal relevance, and personal resonance (see Kuzmičová & Bálint, 2019, for review); the focus in this paper is on developing a measure of individual differences in the tendency to approach narratives in this way.

Theory-of-mind refers to the ability to conceptualize the minds of others and attribute to them mental states separate from our own; fiction has been characterized as a form of social simulation that offers us the ability to practice our theory of mind (e.g., Mar & Oatley, 2008). Attributing mental states to fictional characters is a routine part of engaging with fiction; if one is immersed in a story and experiencing story events alongside the characters, one is going to be attributing emotions and mental states to characters "in the moment." Nonetheless, stepping back from the narrative can sometimes allow one to theorize about the minds of the characters in a different way, thinking more deeply about why characters act the way they do, theorizing about possible meanings of emotional subtext, puzzling over a seemingly inscrutable character, or imagining how a given character might act in a completely different situation. Some scholars have argued that "literary" fiction may provide the kind of challenge that requires more stepping back to mentalize, because the characters may be less easily understood (Kidd & Castano, 2013), but other genres such as mystery may be equally likely to make readers pause, step back, and expend significant mental effort to figure out what's going on in characters' minds. In terms of individual difference variables, just as some individuals are more willing to put work into trying to figure out the minds of others in reality (Carpenter, Green, & Vacharkulksemsuk, 2016), some readers may be more prone to expending the time and effort it takes to step back from the story to effortfully puzzle over the internal lives of the characters.

Transportability and Imaginative Engageability: Complementary or Opposites?

At the state level, individual acts of coauthoring, gap-filling, reflection, or effortfully puzzling over characters' motivations and emotions may require slowing down, pausing, or stepping back from the narrative. Similarly, these acts may sometimes involve switching one's perspective from that of a participant in the narrative, experiencing the story world alongside the characters, to that of someone who is viewing the story *as* a story or someone who is very much present in their own life in that moment. Thus, at the state level, acts of imaginative engagement may sometimes temporarily disrupt the flow of the story and the individual's level of immersion in it. Simultaneously, however, imaginative engagement could subsequently increase a person's level of investment in and appreciation of the characters and the story, which could potentially facilitate the process of becoming re-immersed in the story. Indeed, evidence suggests that, at least for viewing television, that thinking about the self and the real-world (measured in real-time) can enhance transportation (Tchernev et al., 2021).

Thus, although state imaginative engagement could sometimes interfere with state transportation, individuals who tend to become highly transported may also tend to become highly imaginatively engaged, and we would predict a positive correlation between trait-level Transportability and trait-level Imaginative Engagement.

The Current Research

The purpose of these studies was to develop and validate a scale that measures trait imaginative engagement. We hypothesized a four-factor model that would allow us to not only operationalize the construct as a whole, but also facilitate measurement of its contributing factors of coauthoring, Gap-filling, Reflection, and Theory-of-mind. We began with scale development and invariance testing in a large sample. In Study 2, we validate the Imaginative Engagement Scale (IES) with comparisons to existing measures of narrative engagement and related constructs. In Study 3 we confirm the results of Study 2 in a non-student sample and test the association of IES with exposure to eight literary genres. Study 4 examines whether IES scores provide any value above and beyond Transportability in predicting Transportation into and rating of a work of popular fiction. Studies 1 and 2 are pre-registered at http://bit.ly/ImaginativeEngagementScale. Study 3 is pre-registered at https://bit.ly/IES3_

Table 1. Items on the imaginative engagement scale, ordered by hypothesized subscales (Coauthoring, reflection, theory-of-mind, and gap-filling).

coauthoring
(1) I frequently imagine backstories for the characters.
(2) I like to imagine different ways the stories might progress.*
(3) I consider other choices the characters might have made.*
(4) I think about how things might have happened differently in the story.*
(5) I imagine what might happen after the story ends.*
(6) I imagine things about the characters or the story world that the story doesn't mention.
(7) I mentally flesh out parts of the story that are underdeveloped.
Reflection
(8) I often think about how the story applies to my own life.
(9) I find myself reflecting on the meaning of the story.*
(10) I wonder how I would act in the same situation.
(11) I connect what I read and watch to real life.
(12) I discover things about myself as a person from stories.*
(13) I look for themes and meaning in stories.*
(14) I take time to reflect during or after the story.*
Theory of Mind
(15) I enjoy trying to figure out what characters are thinking and feeling.*
(16) I often have theories about why characters act the way they do.
(17) I try to puzzle out the inner workings of the characters' minds.*
(18) I am drawn to characters who are difficult to understand.
(19) I think deeply about the emotions that characters feel toward each other.*
(20) I tend to understand more about what characters are thinking and feeling than appears in the story.*
(21) I imagine how the characters would act under other circumstances.
Gap-filling/Ambiguity
(22) When something in a story is ambiguous, I try to puzzle it out.
(23) I enjoy stories that don't spell everything out for you.*
(24) If a story leaves something unspecified, I tend to imagine the details myself.
(25) I often imagine what happens between chapters, episodes, or installments.
(26) I often read between the lines in stories.*
(27) I enjoy having to fill in parts of the story myself.*
(28) I do not expect the author to give me all the answers.*

Note. Starred items are also on the brief (16-item) form.

prereg. The preregistration for the original experiment for which the Study 4 data was gathered can be viewed at https://osf.io/42x9u. All studies were approved by the University of _____ Institutional Review Board (Studies 1–3: approval #7189; Study 4: #12,496).

Study 1: Scale Development

Items were generated targeting four theoretical constructs believed to contribute to cognitive engagement with fiction: coauthoring, Gap-filling/ambiguity, Reflection, and Theory-of-mind. The final hypothesized model for the IES had seven items per subscale. See Table 1.

Method

Participants and Procedure

At the beginning of the semester, 929 participants completed the IES as part of a departmental prescreening survey. Of these, 439 cases were used for confirmatory factor analyses and item selection (Sample 1a); 444 distinct cases were used to test for invariance (Sample 1b). The IES was presented with various other scales, in random order. Participants read the following stem before viewing the items in random order: "Generally, when reading a book or watching a movie or TV show that I enjoy . . . " See supplemental materials (SM) for details of all samples.

Results

Confirmatory Factor Analyses and Model Comparison

We began by running a CFA on all the items with the hypothesized structure with the data from Sample 1a. We tested a first order, correlation factors model (Figure 1a), a second order hierarchical model (Figure 1b), and a bifactor model (Figure 2), as well as three, two, and single factor models with the 28 items. The hypothesized four-factor bifactor model fitting the data best, SRMSR = .042, RMSEA = .051, 90%C.I.[.046, .057], TLI = 0.925.

Next we explored whether we could make the scale shorter. Iterative exploratory and confirmatory testing revealed an excellent bifactor model with four items loading on each of the four factors, SRMSR = .029, RMSEA = .033, 90%C.I.[.020, .045], TLI = 0.981. As with the full 28-item version, the four-factor models fit the data significantly better than the three, two, and single factor models (see Table S3).

Invariance Testing

Both the full and 16-item versions of the IES met conditions of strict invariance (χ^2_{change} was not statistically significant between progressive models; see Dimitrov, 2010). See SM and Table S3 for details.

Test-retest Reliability

Test-retest reliability was acceptable for both the full (r_{tt} = .67) and short (r_{tt} = .66) versions of the IES, with no differences between the means (*p*s >.300, *d*s ≤0.04; see Table S4).

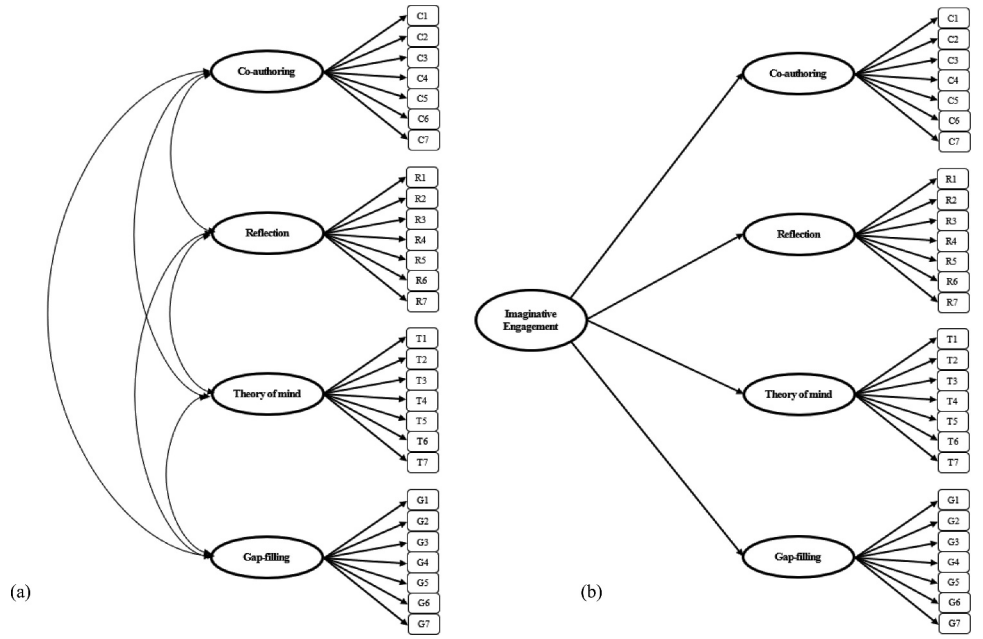

Figure 1. Measurement models compared. We tested three models, the first order, correlated factors(a) and second order, hierarchical(b) models pictured above, as well as the bifactor model in .Figure 2

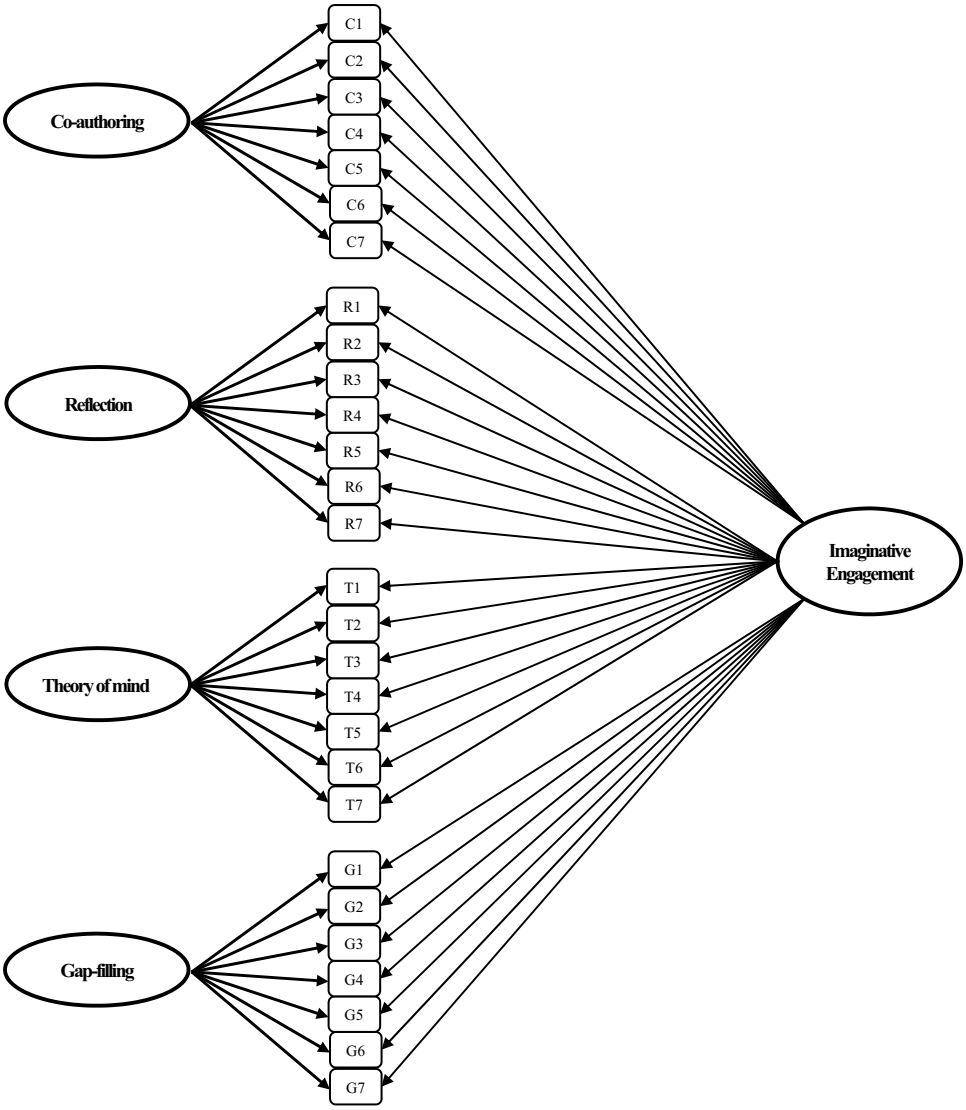

Figure 2. Bifactor model. This model fit the data best in both samples.

Comparisons between Full and Short Versions

Because the 16-item version fit the data best in Sample 1, and the full 28-item scale fit the data best in Sample 2, we compared the full and short versions of the subscales and total scores. In all cases the correlations were strong (*r*s >.90). Internal consistency reliabilities were comparable across the two versions. See Table S5.

Discussion

Results from Study 1 supported our hypothesis that Imaginative Engagement is best explained as an umbrella construct encompassing four latent variables, coauthoring, Gap-filling, Reflection, and Theory-of-mind. Interestingly, whereas the 16-item version fit the data best in Sample 1, the 28-item full IES fit the data best in Sample 2. In all cases, model fit is good to very good. There are two

reasons for preferring the shorter version: fewer items are easier to administrate and simpler to use in structural equation models. However, because internal consistency reliabilities tend to improve with more items, we recommend that researchers focusing on subscales use the full version. Because we collected data with the full scale, we used the full version in Study 2.

Study 2

The purpose of Study 2 was to validate the IES by comparing and contrasting it with existing measures of narrative engagement and associated constructs. We hypothesized moderate to strong correlations with existing measures of narrative engagement, the Transportability Scale (TS; Green, 1996), the Fantasy subscale of the Interpersonal Reactivity Index (IRI; Davis, 1980), and the Narrative Engageability Scale (NES; Bilandzic et al., 2019). Because the Curiosity/Suspense NES subscale is proposed to tap the tendency to cognitively engage with narratives, we predicted that it would be more strongly correlated with IES scores than the other three NES subscales. Given the role that imagination is theorized to play in establishing and maintaining parasocial relationships (Slater et al., 2018), scores on IES should also be related to scores on the Parasocial Interactions Scale (Cole & Leets, 1999).

To discriminate between the IES and existing measures, we compared correlations with scores on the Need for Cognition (Cognition) and Need for Affect (Affect) scales. If the IES tapped a tendency to extensively think and imagine in the process of consuming a story and the other scales (Transportability and NES) tapped primarily the tendency to become emotionally absorbed, then association between scores on the IES and Cognition would be significantly stronger than the associations between Transportability and NES scores. At the same time, the correlation between IES scores and Affect would be weaker than the correlations between Affect and the other scales.

To further explore the cognitive vs. affective distinction, we also used the Empathic-concern and Perspective-taking IRI subscales, which are presumed to measure the affective and cognitive facets of empathy respectively (Davis, 1980). We expected scores on the IES Theory-of-Mind subscale to be significantly and positively correlated with empathy, with a stronger association with Perspective-taking. Assuming that the IES would be less strongly related to empathy than existing measures of narrative engagement, we expected these (Transportability, NES, Fantasy) to be more strongly related to Empathic-concern and Perspective-Taking. See Table 2 for details.

Finally, we expected IES scores to be positively correlated with reading more books and viewing more television. We also expected participants who preferred literary fiction to score higher on the IES than those who preferred genre fiction or nonfiction.

Participants and Procedure

As in Study 1, participants were college students in the departmental research pool (N = 531 (72.3% female). The IES and the questionnaires described below were presented in random order following demographic questions. Afterward, participants answered questions about their media preferences: books read per month, and TV shows followed on a regular basis. A subset of participants completed the Young Adult Fiction Test, an author checklist used to gauge reading exposure (Black & Barnes, 2021).

Instrumentation

Participants completed three existing measures of narrative engagement, Green's (1996; see also Dal Cin, Zanna, & Fong, 2004) Transportability Scale, the four-factor Narrative Engageability Scale (Bilandzic et al., 2019), and the 7-item Fantasy subscale of Davis's (1980) Interpersonal Reactivity Index. They also completed measures of Parasociability (Cole & Leets, 1999), Need for Cognition

Table 2. Pre-registered hypotheses and effects found. Effects for fully supported hypotheses bolded; effects counter to hypotheses in red.

Hypothesis	Association	Hypothesized effect	Effect found
H1	(Factor structure)	Four latent variables	**Four**
H2	Transportability (TS)	$.30 \leq r \leq .55$	.65[.59, .71]
H3	Narrative Engageability (NES)	$.40 \leq r \leq .60$	**.58[.50, .64]**
H3a	NES Suspense/curiosity	Stronger than total NES	.47[.39, .54]
H4	IRI Fantasy	$.25 \leq r \leq .40$	.59[.53, .65]
H5	Parasocial Interactions	$.15 \leq r \leq .40$	.47[.39, .54]
H6	Need for Cognition	$.25 \leq r \leq .40$	**.36[.27, .43]**
H6a	IES Gap-filling	Strongest	**.39[.31, .46]**
H6b	Cognition: IES vs. TS	Stronger for IES	**$Z = 3.20$, $p < .001$**
H6c	Cognition: IES vs. NES	Stronger for IES	**$Z = 5.73$, $p < .001$**
H6d	Cognition: IES vs. Fantasy	Stronger for IES	**$Z = 3.93$, $p < .001$**
H7	Need for Affect	$r \leq .25$	.30[.20, .39]
H7a	Affect: IES vs. TS	Weaker for IES	**$Z = 2.92$, $p = .002$**
H7b	Affect: IES vs. NES	Weaker for IES	$Z = 1.55$, $p = .061$
H7c	Affect: IES vs. Fantasy	Weaker for IES	$Z = 1.58$, $p = .057$
H8	(Empathy)		
H8a	IES-ToM & Perspective-taking	$.20 \leq r \leq .45$	**.32[.24, .41]**
H8b	IES-ToM & Empathic-concern	$.15 \leq r \leq .35$	**.17[.07, .26]**
H8c	Empathy: IES vs. other scales	Weaker for IES	**See** Table 4
H9a	Books-per-month	Positive correlation	**.28[.20, .36]**
H9b	TV shows followed	Positive correlation	**.12[.04, .21]**
H10	Genre preference	Literary: higher IES	**See Figure 3**

Table 3. Study 2. Correlations of IES total scores and subscales with validity measures. Internal consistency reliability (Cronbach's alpha) in first column and stop row beneath IES headings.

	α	IES Total .93	CoAuthoring .80	Reflection .80	Theory-of-mind .84	Gap-filling .78
Narrative Engageability						
Total score	.90	.58[.50, .64]	.53[.46, .60]	.51[.44, .58]	.52[.45, .59]	.46[.37, .54]
Curiosity/Suspense	.64	.47[.39, .54]	.44[.37, .52]	.40[.32, .48]	.44[.36, .52]	.37[.28, .45]
Emotional engageability	.81	.49[.41, .56]	.47[.39, .54]	.47[.39, .54]	.44[.36, .51]	.36[.28, .44]
Unrealism	.81	.54[.47, .61]	.51[.44, .58]	.46[.38, .54]	.49[.41, .56]	.45[.37, .52]
Presence	.73	.47[.39, .55]	.41[.33, .49]	.41[.33, .48]	.45[.37, .52]	.39[.30, .48]
Transportability	.88	.65[.59, .71]	.60[.53, .65]	.59[.53, .65]	.59[.53, .65]	.52[.44, .58]
Fantasy	.75	.59[.53, .65]	.54[.47, .61]	.55[.48, .61]	.54[.47, .61]	.45[.37, .52]
Parasociability	.91	.47[.39, .54]	.44[.36, .52]	.39[.32, .47]	.43[.35, .51]	.36[.27, .45]
Need for Cognition	.85	.36[.27, .43]	.26[.17, .35]	.28[.19, .36]	.32[24, .39]	.39[.31, .46]
Need for Affect (approach)	.79	.30[.20, .39]	.28[.19, .37]	.29[.20, .38]	.29[.19, .38]	.19[.10, .29]
Empathy						
Empathic concern	.80	.18[.08, .28]	.19[.10, .28]	.21[.12, .30]	.17[.07, .26]	.07[−.02, .16]
Perspective-taking	.70	.32[.24, .40]	.28[.20, .37]	.29[.20, .37]	.32[.24, .41]	.24[.16, .31]

$N = 531$. Bias-corrected and accelerated bootstrapping ($N = 5{,}000$) used to obtain confidence intervals.

(Cacioppo et al., 1984), Need for Affect (Appel, Gnambs, & Maio, 2012, empathy (empathic-concern and perspective-taking subscales of Davis's, 1980 IRI), and exposure to Young Adult fiction (Black & Barnes, 2021). See SM and Table 3 for details of all validity measures.

Results

See SM for preliminary analyses.

Existing Measures of Narrative Engagement

As predicted, there was a positive correlation between IES scores and Transportability, though the association was stronger than expected, $r(529) = .65$. The correlations between total IES scores and Narrative Engageability fell within the hypothesized range ($r(529) = .576$), as were those between IES

Table 4. Comparisons of correlations using Steiger's z between IES and other narrative engagement scales with related measures (Studies 2 and 3).

	Parasociability	Need for Cognition	Need for Affect	Empathic-concern	Perspective-taking	Books	TV
Study 2							
IES (28-item)	.463	.354	.301	.175	.315	.279	.088
NES	.613***	.133***	.358†	.274**	.254†	.208*	.134
Transportability	.562***	.244***	.399**	.320***	.258*	.244	.132
Fantasy	.555**	.207***	.358†	.355***	.264†	.194*	.131
Study 3							
IES	.548	.356	.482			.212	.141
NES	.652**	.145***	.515			.258	.175
Transportability	.573	.256**	.446			.181	.200

N = 531 for Study 2, *N* = 351 for Study 3. Asterisks indicate significant differences (Steiger's *z*) between IES correlations with related measures (Parasociability, Cognition, Affect, Empathic-concern, Perspective-taking, Books read per month, and TV shows followed) and the correlations of these measures with alternate narrative engagement scales (NES, Transportability, Fantasy). ***$p < .001$; **$p < .01$; *$p < .05$; $^{\dagger}p < .10$.

and Fantasy subscale, $r(529) = .59$. Contrary to hypothesis, the NES Curiosity/Suspense subscale did not have the strongest association with IES scores. The correlation between IES scores and Parasociability was stronger than expected, $r(529) = .47$. See Table 3.

Convergent and Discriminant Validity

Need for cognition

As hypothesized, IES had a moderate positive correlation with Cognition, $r(529) = .357$. The effect was stronger than that between Cognition and Transportability ($r = .244$, Steiger's z=3.28, $p < .001$), NES ($r = .133$, $z = 5.80$, $p < .001$), and Fantasy ($r = .207$, $z = 4.00$, $p < .001$). See Table 4.

Need for affect

The correlation between Affect and IES was slightly stronger than expected, $r(529) = .301$; however, it was significantly weaker than the correlation between affect and Transportability. See Table 4.

Empathy

The predicted moderate positive correlation between the IES theory-of-mind subscale and perspective-taking was confirmed, $r(529) = .324$. As expected, the correlation with empathic-concern was weaker, $r = .168$, and the correlations between empathic-concern and other measures of narrative engagement were significantly stronger. Interestingly and contrary to expectations, the correlation between perspective-taking and IES was stronger that those between perspective-taking and other measures. See Table 4.

Media preferences

As expected, Total IES was related to more books read per month ($r_s = .282$) and more TV shows followed ($r = .122$). Also in line with hypotheses, people who preferred literary fiction had higher IES scores, but the differences with Fantasy and Historical Fiction were not statistically significant (See Figure S1 in SM). Familiarity with Young Adult authors was positively correlated with Total IES scores, $r(284) = .15$, 95%CI[.04, .25], $p = .013$.

Post Hoc Analyses

Because of the high correlation between Transportability, Narrative Engageability, and IES scores, we examined the overall factor structure of all three scales together, starting with a simple Exploratory Factor Analysis (EFA GEOMIN rotation) and then used Exploratory Structural Equation Modeling (ESEM, target rotation; Asparouhov & Muthén, 2009; Marsh, Morin, Parker, & Kaur, 2014), using

MPlus v7.11 (Muthén & Muthén, 1998-2012). Our purpose was to identify potential overlapping items, test for cross loadings, determine latent factor correlations, and achieve a better understanding of the unique contribution of each scale.

The three-factor model was significantly better than both the one- and two-factor models in both EFA and ESEM. Results of the EFA showed all 28 IES items loading on the first factor with slopes varying from .301 to .755 (See Table S6 in SM); there were two cross-loadings with NES, with slopes ≤ .173, and seven on Transportability ($\lambda \leq .359$). All 12 NES items loaded positively and significantly on the second factor ($.276 \leq \lambda \leq .777$); three also loaded on IES (one negatively) and four on the TS. Sixteen Transportability items loaded positively on the third factor; the other two had negative slopes. Eight TS items also loaded significantly on the NES factor and three loaded on the IES factor (one negatively).

ESEM combines features of EFA and CFA to allow testing of a specified factor structure while at the same time permitting each item to load on any factor (Asparouhov & Muthén, 2009; Marsh et al., 2014). Thus, we could test whether the hypothesized three-factor (IES, TS, NES) structure fit the data, while also testing the extent to which items cross-loaded on the other scales. Fit for the three-factor ESEM model was acceptable, SRMSR = .045, RMSEA = .055. IES items loaded strongly on our IES factor; cross-loadings with TS were generally much weaker or negative, the exceptions being items 8 and 11 (See Table S6). Cross-loadings for IES and NES are even weaker. Again, NES items all load positively on an NES factor, though 5/12 also load on the Transportability factor. Once again, TS items do not load clearly on one factor. Latent factor correlations were strongest for TS-NES scores, (r = .604), whereas IES-TS was r = .558, and IES-NES was r = .529. See SM for details.

Discussion

Most of our hypotheses concerning the relationship of IES scores and convergent validity constructs were confirmed; all were in the expected direction. The only hypothesis that was not confirmed concerned a subscale of the Narrative Engageability Scale. The correlation between IES and Transportability was stronger than expected, and the correlations with total NES and Fantasy were also strong; however, the correlations between IES scores and Cognition were significantly stronger than those between Cognition and existing measures (Transportability and NES), whereas the existing measures had stronger correlations with Affect and empathic-concern. Although unexpected, IES scores were more strongly related to perspective-taking than other narrative engagement scales. This makes sense in light of prior research using the IRI perspective-taking subscale to operationalize "cognitive" empathy and the empathic concern subscale to operationalize affective empathy (Cox et al., 2012). Notably, no gender difference was found on the IES, whereas women had much higher scores than men on all other measures of narrative engagement.

As expected, more reading and TV viewing was associated with higher scores on the IES. Further, people who chose literary fiction as their favorite genre had higher scores than those who chose different genres or nonfiction as their preferred reading material.

Of some concern were the strong correlations with other measures of narrative engagement, particularly the stronger-than-expected IES-Transportability association. Exploratory analyses (EFA and ESEM) grouped items from the three scales within their corresponding factors, and the cross-loadings between IES and the other two scales were limited. Though latent factor correlations suggest some overlap between scales, particularly TS and NES, overall these analyses provide evidence of the viability of the IES as a unique instrument with the potential to facilitate study of individual differences in narrative engagement that go beyond a focus on immersion. For researchers interested in immersion or emotional engagement, we suggest complementing the IES with one of the other scales.

Table 5. Study 3. Correlations of IES Total scores and subscales with Validity measures. Internal consistency reliability in first column and top row.

		IES Total	CoAuthoring	Reflection	Theory-of-mind	Gap-filling
	α	.96	.89	.87	.90	.85
Narrative Engageability	.89	.63[.56, .70]	.57[.49, .65]	.62[.54, .69]	.61[.53, .68]	.52[.43, .60]
Transportability	.88	.70[.63, .76]	.63[.54, .70]	.67[.60, .73]	.65[.56, .72]	.61[.53, .69]
Parasociability	.91	.55[.43, .65]	.50[.39, .60]	.56[.44, .65]	.50[.39, .61]	.44[.33, .55]
Need for Cognition	.95	.36[.24, .47]	.25[.12, .37]	.34[.23, .45]	.34[22, .45]	.36[.25, .47]
Need for Affect	.78	.48[.39, .57]	.39[.28, .49]	.51[.43, .58]	.49[.41, .57]	.37[.25, .47]

\Bias-corrected and accelerated bootstrapping (N = 5,000) used to obtain confidence intervals.

Study 3

The primary purpose of Study 3 was to replicate the results of Study 2 in a non-student, gender-balanced sample obtained via Amazon.com's Mechanical Turk (MTurk). Detailed hypotheses and planned statistical tests are available at https://bit.ly/IES3_prereg (for gender-related: https://bit.ly/IES3_pregender).

Method

Participants and Procedure

Participants (N = 337, 44.8% female, mean age =39.49, SD = 12.08) were recruited on MTurk and paid $1.50 for fully completing the study. As in Study 2, participants were asked to name their preferred genre. The questionnaires were presented in random order. The full 28-item IES was used, as well as the Transportability, Narrative Engageability, Parasociability, Cognition, and Affect scales, as described in Study 2 (see Table 5), along with the Genre Familiarity Test to measure reading exposure (see SM). See Table S7 in SM for distributions of scores and transformations.

Results

Convergent Validity

As expected, IES scores were strongly and positively correlated with both Transportability (r(322) = .70) and Narrative Engageability (r(322) = .63). The correlation between IES scores and Parasociability was slightly stronger than expected (r(322) = .55). The association between IES and Cognition (r = .36) confirmed hypotheses, and as predicted, the correlation was strongest with the Gap-filling subscale. The association between IES scores and Affect was stronger than expected, r = .48. See Table 5 for details.

Discriminant Validity

As hypothesized, the correlation between IES scores and Cognition was stronger than those between Cognition and Transportability and Narrative Engageability (see Table 4). Given that the correlation between IES and Affect was stronger than expected, there was no difference between this relationship and those between Affect and the other measures of narrative engagement.

Reading Preferences and Behavior

As expected, Total IES scores were positively correlated with number of books read per month (r_s = .21, 95%CI[.11, .32]) and TV shows followed (r_s = .14[.03, .25]. We had also predicted higher IES scores for participants who prefer literary fiction. This hypothesis was partially confirmed. Participants who

preferred Classical Literary fiction (M = 4.31) had the highest Total IES scores, but the difference with Historical Fiction was not statistically significant ($p_{\text{one-tailed}}$ = .083, d = 0.50). All other differences were significant ($ps_{\text{one-tailed}} \leq .032$, $0.54 \leq d \leq 1.08$). See Figure S2 in SM.

Reading exposure

Our hypotheses regarding the association between genre familiarity and IES total scores and subscales were only partially confirmed. With few exceptions (the correlations between Reflection and Fantasy and Theory-of-Mind and Romance were very weak and negative), all correlations were positive, but only six were statistically significant. As expected, the strongest associations were with literary fiction (Total IES: $r(305) =$ 14). See SM for details

Gender Differences

As hypothesized, women reported greater transportability than did men and scored higher on the NES. Conversely, there were no significant gender differences in Total IES or its subscales. See Table S8 SM for all gender differences.

Discussion

The purpose of Study 3 was to replicate the primary results of Study 2 in a non-student sample. For the most part, our hypotheses were confirmed: IES scores were strongly correlated with the criterion measures of Transportability and Narrative Engageability. Unexpectedly, the associations with Parasociability and Affect were slightly stronger than they had been in Study 2. The correlations with Cognition confirmed hypotheses: IES scores were more strongly correlated with Cognition than either Transportability or IES. This, along with the fact that there were no gender differences in IES scores suggests that our scale is capturing cognitive elements of narrative engagement missed by existing measures.

As in Study 2, participants who selected literary fiction as their favorite genre tended to score higher on the IES. However, contrary to expectations, we found only weak positive correlations between IES and reading exposure, even with literary genres. This somewhat calls into question the common assertion that literary fiction requires more imaginative engagement than popular fiction.

The results in Study 3 also call into question one possible interpretation of how the Transportability Scale and the Narrative Engageability scale differ from the Imaginative Engagement Scale. Because the former two scales contain items that focus on the emotional aspect of narrative absorption, and the IES only mentions emotions in the context of theory of mind one possible characterization of the differences between the IES and the other scales is that they are skewed toward emotional engagement, whereas the IES focuses on a more cognitive style of approaching stories. Notably, however, although the relationship between IES and Cognition was stronger than the relationship between Cognition and the other scales, there was no difference in the strength of the relationships with Affect, a result that diverges from that found in Study 2. In many ways, this makes sense. Although imaginative engagement should appeal to individuals who seek out puzzles and complexity and enjoy thinking, it seems likely both that the motivation to engage in these activities may depend on one's emotional investment in the story and that engaging in these activities may increase its emotional potency. Thus, it makes sense that Affect might have a stronger relationship to IES than was expected based on Study 2.

Nonetheless, the lack of a difference in the strength of the relationships between Affect and the three scales (NES, TS, and IES), as well as the strong relationship between IES, NES, and TS, calls into question the separate utility of the IES. Although discriminant validity was established in Studies 2 and 3 by the stronger relationship between IES Cognition relative to the other measures, and the

exploratory analyses in Study 2 provided some evidence of the viability of the IES as a unique instrument, further investigation was needed to determine whether the IES added value in predicting narrative outcomes over and above the highly-related TS.

Study 4

The purpose of Study 4 was to examine whether the Imaginative Engagement Scale adds value above Transportability Scale in predicting two outcome measures: state Transportation into a work of popular fiction and participant rating of how much other readers would like it (e.g., how well-written. enjoyable, and believable the story is; see SM). Reading time, was also examined, to see if a predisposition toward Imaginative Engagement resulted in any kind of "slow down" effect. To examine these questions, we used a preexisting dataset that included all five measures of interest: TS, IES, Transportation (state), story rating, and reading time.

Method

Participants and Procedure

Participants were college students in the departmental research pool (N = 215); 76.7% female, 96.7% under 21)). After consenting, participants were randomly presented with the IES (r_α = .93) and TS (r_α = .89) to complete before beginning a distractor task. They were then randomly assigned to read excerpts from the novel *Refugee* by Alan Gratz (see SM). Upon finishing reading, participants completed the state Transportation Scale (STS; Green & Brock, 2000; r_α = .79, see SM), as well as a measure of story rating in which they were asked to rate how they thought others would like the story in 7 dimensions using a slider bar from 0 (Not at all) to 100 (Extremely) (r_α = .75).

Results

Reading Time

The regression model predicting reading time from IES and Transportability scores was not significant, $F(2, 212)<0.01$, p = .998. Neither predictor was significant (ps >.950).

Transportation

Together, IES and Transportability accounted for 29.4% of the variance in state transportation, $F(2, 212) = 44.18$, $p < .001$, $R^2 = .294$. Transportability was the strongest predictor, accounting for 6.2% of the variance over and above IES, $\beta = .353$, $p < .001$. IES scores accounted for 2.7% of the variance after controlling for Transportability, $\beta = .231$, $p = .005$.

Story Rating

IES and Transportability together explained 6.0% of the variance in story rating, $F(2, 212) = 6.77$, $p = .001$, $R^2 = .294$. IES scores alone accounted for 2.7% of the variance in rating over and above Transportability, $\beta = .231$, $p = .015$, $sr^2 = .027$. Transportability was not significantly related to story rating in the presence of IES, $\beta = .019$, $p = 840$, $sr^2 < .001$.

Mediation Model

Finally, we tested for an indirect effect of IES on story rating via state transportation, controlling for Transportability. Together, IES, Transportability, and state Transportation accounted for 19.9% of the variance in story rating, $F(3, 211) = 17.43$, $p < .001$, $R^2 = .199$. Transportation fully mediated the effect of IES on rating ($ab = .103$, 95% CI [.02, .19], $c' = 0.290$, $p = .150$): in other words, in the presence of transportation, the association between IES and rating was no longer significant.

Study 4 Discussion

The purpose of Study 4 was to test the predictive value of IES scores controlling for Transportability. We operationalized narrative engagement as reading time, state transportation, and story rating. Surprisingly, neither IES nor TS scores were related to reading time, but they did both predict state transportation and story rating (although Transportability was not significantly related to rating in the presence of IES). Importantly, IES scores accounted for a small but significant portion of the variance in both story rating and state Transportation over and above Transportability. This was especially indicative of the added value of using the IES, because of the similarity between the state transportation and trait transportability scales, the latter of which was developed specifically to describe persistent individual differences in the former (Dal Cin et al., 2004; Green & Brock, 2000). We also tested an indirect effects model and found that state transportation fully mediated the associated between IES scores and story rating, even controlling for Transportability. This suggests that trait imaginative engagement encouraged state transportation which in turn increased rating; the fact that the scales were completed in temporal order supports a causal mechanism.

General Discussion

The purpose of this research was to develop a measure of individual differences in imaginative engagement that reflected the four hypothesized underlying constructs of coauthoring, Reflection, Theory-of-mind, and Gap-filling. In Study 1, we focused on scale development, using a large sample of college undergraduates. Our hypothesized model fit the data well, for both a full, 28-item measure as well as a 16-item short-form. Both versions of the IES demonstrated metric, scalar, and strict invariance, and test-retest reliability was good. Across undergraduate and MTurk samples in Studies 2 and 3, we validated the IES with relation to existing measures, and a fairly consistent pattern of results emerged. Across both studies, IES scores were predictive of media use and preferences and were moderately to strongly correlated with other measures of narrative engagement, including Transportability, Narrative Engageability, Parasocial Interaction, and Fantasy Empathy (tested only in Study 2). As predicted, both Study 2 and Study 3 found that Cognition was more strongly related to IES scores than to other measures of narrative engagement. Across both studies, women scored higher than men on Transportability and Narrative Engageability, whereas there were no gender differences on the IES. Finally, in Study 4, we found that IES predicted state transportation into and story rating of a work of popular fiction, above and beyond the effects of trait Transportability. Taken as a whole, the results of these studies are striking for several reasons.

First, the stronger relationship between Cognition and Imaginative Engagement, relative to other trait measures of narrative engagement, verifies that the IES is indeed capturing some cognitive aspects of story engagement overlooked by previous scales. Although prior research has examined the role that Need for Cognition plays in reading and media preferences (Condra, 1992; Tolentino, Curry, & Leak, 1990), enjoyment of not knowing how a story ends (Rosenbaum & Johnson, 2016), and transportation into interactive narratives (Green & Jenkins, 2020), the current study is the first to focus explicitly on the range of ways that individuals with a tendency to engage in and enjoy thinking may tend to think about and play with narratives while consuming them.

The relationship between Need for Affect and Imaginative Engagement, relative to other trait measures of narrative engagement, is somewhat less clear. In Study 2, Affect was found to be more strongly related to Transportability, Narrative Engageability, and Fantasy empathy than to Imaginative Engagement; however, this effect was not replicated in Study 3, where the relationship between Affect and IES was stronger than anticipated. This is striking, given that the IES does not focus at all on the emotions one tends to experience while consuming narratives. Future research is needed to explore the ways that Affect may "push" readers to become not only emotionally absorbed in narratives (Appel & Richter, 2010), but also to dwell on characters and emotions depicted therein. Future research is also needed to investigate whether individual acts of imaginative engagement deepen the emotional connection felt to characters.

Notably, in Study 4, trait Imaginative Engagement predicted state Transportation into excerpts from the novel *Refugee*, above and beyond Transportability. This is striking for several reasons. First, the Transportability Scale is an adaptation of the Transportation scale, and therefore the items contained on the two are very similar. Further, because imaginative engagement (at the state level) entails stepping back from the story to think, it would make sense for state imaginative engagement to *interfere* with the state-level experience of becoming completely absorbed in the story world; yet, in this study, we found that IES scores were positively related to state Transportation. This raises a variety of questions for future research, including whether a dispositional tendency toward Imaginative Engagement is related to the motivation to engage with written narratives in real-time (see Tchernev et al., 2021). Given that *Refugee* is an emotionally charged middle-grade novel and not challenging in the literary sense, further research is required to test similar mechanism models in experiments where participants read more complex stories. It is an open question whether IES would account for a higher percentage of the variance if a more challenging literary text was used.

Although the current study contributes to prior research on trait-level individual differences in narrative engagement, several limitations should be noted. First, the relationship between IES scores and Transportability was stronger than predicted. However, across three studies, we presented evidence that these measures are indeed distinct. In Study 2, exploratory analyses grouped items from the three scales within their corresponding factors, and the cross-loadings between IES and the other scales were limited. In Studies 2 and 3, Cognition was more strongly related to IES than to Transportability. Finally, in Study 4, IES predicted both story rating and state transportation above and beyond Transportability. Although this body of evidence supports the use of the IES in conjunction with the Transportability (or Narrative Engageability) scales in future research, it is nonetheless notable that the two constructs are more strongly related than initially predicted, particularly given the fact that at the state level, transportation involves getting swept up in a story world, whereas state-level imaginative engagement often requires taking a step back.

Another limitation of the current research is that although Imaginative Engagement was conceptualized as a process that may occur while reading, it also likely occurs retrospectively, or upon rereading. Indeed, it is possible that participants in our current study may have disregarded the instructions and reported retrospective behavior, rather than focusing solely on what occurs *while* consuming fiction. Future research is necessary to compare Imaginative Engagement to other measures aimed at examining how readers engage with texts after reading, such as Retrospective Imaginative Involvement (Slater et al., 2018), and to examine which types of imaginative engagement are more likely to occur while reading versus after.

Disclosure Statement

No potential conflict of interest was reported by the author(s).

Data availability statement

The data described in this article are openly available in the Open Science Framework at https://osf.io/nm4wh/.

Open Scholarship

This article has earned the Center for Open Science badges for Open Data, Open Materials and Preregistered. The data and materials are openly accessible at https://osf.io/nm4wh/, https://osf.io/nm4wh/, and http://bit.ly/ImaginativeEngagementScale.

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