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Narrative Fiction and Expository Nonfiction Differentially Predict Verbal Ability

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Although reading is known to be an important contributor to language abilities, it is not yet well established whether different text genres are uniquely associated with verbal abilities. We examined how exposure to narrative fiction and expository nonfiction predict language ability among university students. Exposure was measured both with self-report and with recognition tests of print exposure. Verbal ability was measured in the form of synonym knowledge, analogies, sentence completion, and reading comprehension in 4 different studies. Across all studies, narrative fiction was a better predictor of verbal abilities relative to expository nonfiction. When examining unique associations, controlling for demographic variables and the other genre, fiction remained a robust predictor, whereas nonfiction became a null or weak negative predictor. In light of this evidence, it appears that what we read plays an important role in how reading contributes to language development.

Reading has long been recognized as one of the primary means by which verbal abilities are acquired (Mol & Bus, 2011). The question of whether what is read makes a difference—whether genre plays some role in this relationship—has not often been asked, however. The current studies examined whether preference and exposure to two broad genres, narrative fiction and expository nonfiction, differentially predict various aspects of verbal ability.

READING AND VERBAL ABILITY

Research on reading typically operationalizes a lifetime of reading behavior as exposure to print, measured using a form of recognition test (Stanovich & West, 1989). In children, print exposure predicts a wide range of positive outcomes pertaining to language ability and reading behavior, even after controlling for relevant factors such as age and intelligence (e.g., Allen, Cipielewski, & Stanovich, 1992; Cipielewski & Stanovich, 1992; Cunningham & Stanovich, 1991, 1997; Davidse, de Jong, Bus, Huijbregts, & Swasab, 2011; Ecalle & Magnan, 2008). Although fewer studies have focused on adults, print exposure also predicts verbal ability in these populations (Martin-Chang & Gould, 2008; Osana, Lacroix, Tucker, Idan, & Jabbour, 2007). This is true even after controlling for related factors including age, education, reading comprehension, and intelligence (Burt & Fury, 2000; Cunningham & Stanovich, 1997; Sparks, Patton, & Murdoch,

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2014; Stanovich & Cunningham, 1992; West, Stanovich, & Mitchell, 1993). A comprehensive meta-analysis of 99 studies recently confirmed that print exposure is an important predictor of verbal abilities, with participant populations ranging from infancy to young adulthood ($N = 7,669$; Mol & Bus, 2011). Of importance, this meta-analysis also found that print exposure predicts important life outcomes related to verbal ability, such as academic achievement. That exposure to print makes valuable contributions to language development is thus well-established, but whether different types of text differentially predict verbal abilities is less certain.

TEXT GENRE AND VERBAL ABILITY

There are a number of theoretical reasons why different genres of text might be differently associated with verbal ability. Genres are distinguished by characteristic tropes and these unique aspects may influence language learning, for example. Two broad genres of interest to researchers are narrative fiction (e.g., novels, short stories) and expository nonfiction (e.g., argumentative essays, instructional manuals). Narrative fiction and expository nonfiction differ in their formal structure (Barthes, 1982; Graesser, Haut-Smith, Cohen, & Pyles, 1980) with only narratives representing the goal-oriented structure of human experience (Bruner, 1986; Gerrig, 1993; Oatley, 1999). The two genres also differ in terms of content. An analysis of children's storybooks revealed that the words exclusive to narrative texts emphasize human characteristics and interactions, whereas those unique to expository texts are informational and scientific (Gardner, 2004). Narrative fiction is also less lexically dense and contains fewer technical words than expository nonfiction (Nation & Waring, 1997). These differences in structure and content could easily influence processes related to language growth. In support of this idea, the two genres differ with respect to outcomes such as memorability and ease of comprehension (e.g., Graesser et al., 1980; Kintsch & Young, 1984; Petros, Bentz, Hammes, & Zehr, 1990). It may be that a memorable context gives fiction an advantage for facilitating language learning. The lexical differences between these two genres may also affect verbal learning opportunities, with expository texts being more difficult to read, making inferring the meaning of novel words difficult (Gardner, 2004). Before any of these theoretical explanations can be tested, however, it is first important to establish whether the phenomenon in question actually exists (Rozin, 2009): Is there evidence that narrative fiction and expository nonfiction are differentially associated with verbal abilities?

Unfortunately, the current empirical evidence relevant to this question is somewhat mixed. Of importance, very few past studies have directly compared these two genres within the same analysis to examine whether either genre uniquely predicts verbal ability, controlling for the influence of the other (e.g., within a single regression). In a study of sixth-grade students, self-reported fiction reading predicted successful word identification, vocabulary, and reading comprehension (Spear-Swerling, Brucker, & Alfano, 2010). In contrast, nonfiction reading had weak negative associations with these same measures. These results differ, however, from another study with similarly aged students; in this case, self-reported reading of both genres predicted better vocabulary scores, controlling for previous abilities (Lawrence, 2009). Recently, McGeown and colleagues (2015) examined a group of adolescents (ages 11–16) and found that time spent reading fiction books was the best predictor of verbal abilities. Of importance, these researchers included other genres of reading in a simultaneous regression and found that fiction was the only unique predictor.

Studies on adults show similar inconsistencies as those with children. In a study of college students, self-reported fiction reading was positively associated with reading comprehension, whereas nonfiction reading was only weakly related (Acheson, Wells, & MacDonald, 2008). This same study, however, failed to find associations with many other measures of verbal ability for either genre, including reading time, sentence comprehension, and even a different measure of reading comprehension. It may be that this absence of observed associations could be due to the self-report nature of the reading measure employed, because a study using recognition measures of print exposure found quite different results (Osana et al., 2007). In this study, both fiction and nonfiction print exposure strongly predicted vocabulary in college students (fiction, $r = .66$; nonfiction, $r = .46$). Unfortunately, no direct comparison between fiction and nonfiction was made, so it is not known how each genre uniquely predicted vocabulary after taking shared variance into account. This is an important consideration because fiction and nonfiction print exposure are highly correlated (e.g., Mar, Oatley, Hirsh, dela Paz, & Peterson, 2006). A post hoc test based on the reported data (Steiger, 1980) finds that fiction is a stronger predictor of vocabulary than nonfiction, $t(109) = 2.53, p = .01$. In contrast, no difference in prediction was observed for the two genres with respect to textual inference (fiction, $r = .27$; nonfiction, $r = .13$) or syllogistic reasoning (fiction, $r = .39$; nonfiction, $r = .35$), confirmed by post hoc tests ($ps > .15$).

In sum, there is tentative evidence that exposure to fiction may be a better predictor of verbal ability relative to nonfiction, but the evidence is mixed, based primarily on child samples, and no study of adults has examined unique prediction by each genre. It is also not clear whether any differential association holds across a broad range of verbal ability measures.

THE CURRENT STUDIES

We present four studies examining how preferences and exposure to narrative fiction and expository nonfiction predict verbal ability in a university student population. Sample details for all studies appear in Table 1. All participants were undergraduate students taking introductory

TABLE 1
Sample Details and Demographics for All Studies

Study	Initial Sample	Final Sample	Age	Years of English Fluency
1	368	340 (82 male)	$M = 19.84$ $SD = 3.88$ (17–46)	$M = 19.03$ $SD = 3.16$
2	234	227 (68 male)	$M = 20.64$ $SD = 4.61$ (9–49)	$M = 20.03$ $SD = 4.90$
3	229	219 (87 male)	$M = 19.84$ $SD = 3.02$ (16–44)	$M = 19.46$ $SD = 3.29$
4	177	174 (64 male, 1 not reporting)	$M = 20.06$ $SD = 3.42$ (18–44)	$M = 19.47$ $SD = 3.80$

Note. Exclusions were made based on short completion times (Study 1: < 2 min; Study 2: < 9 min; Study 3: < 10 min; Study 4: < 9 min), reporting answering randomly or incorrectly ($n = 2$, Study 1), giving inappropriate answers ($n = 1$, Study 3), searching for answers online ($n = 1$, Study 3), computer errors ($n = 5$, Study 1), reporting less than 9 years of English fluency, and reporting an occupation in publishing or some other book-related industry. Ignoring the latter two would reduce the validity of the print-exposure measures. All exclusions were made a priori, before the data were analyzed.

TABLE 2
Example Items for Measures of Verbal Ability and Self-Reported Reading

<i>Item Type</i>	<i>Example</i>
Self-reported reading habits and preferences	<p>I like to read fiction (novels, etc.). I prefer to read fiction (novels, etc.) over nonfiction (biographies, etc.). – Responses made on a 7-point scale: (1) <i>strongly disagree</i>, (4) <i>neither agree nor disagree</i> to (7) <i>strongly agree</i>. I read fiction (novels, short stories, etc.). – Responses made on a 7-point scale: (1) <i>never</i>, (3) <i>occasionally</i>, (5) <i>roughly once a month</i>, (7) <i>roughly once a week</i>, and (9) <i>roughly every day</i>. (Items measuring nonfiction-reading habits were identical, except with “nonfiction” replacing “fiction.”)</p>
Synonyms (Study 1)	<p>Select the word below whose meaning is closest to: “precarious” – unpleasant – perilous – secure – stealthy</p> <p>Select the word below whose meaning is closest to: “rudimentary” – significant – artificial – equivalent – primitive</p>
Analogies (Study 2)	<p>Optimist is to cheerful as pessimist is to – gloomy – mean – petty – helpful</p> <p>Candid is to indirect as honest is to – frank – wicked – truthful – untruthful</p>
Sentence completion (Study 3)	<p>The novel’s protagonist, a pearl diver, naively expects that the buyers will compete among themselves to pay him the best price for his pearl, but instead they — to — him. – venture . . . reward – pretend . . . praise – conspire . . . reimburse – refuse . . . cheat – collude . . . swindle</p> <p>Nightjars possess a camouflage perhaps unparalleled in the bird world: by day they roost hidden in shady woods, so — with their surroundings that they are nearly impossible to — . – vexed . . . dislodge – blended . . . discern – harmonized . . . interrupt – impatient . . . distinguish – integrated . . . classify</p>

(Continued)

TABLE 2
(Continued)

<i>Item Type</i>	<i>Example</i>
Reading comprehension (Study 4)	<p><u>Passage 1:</u> I know what your e-mail in-box looks like, and it isn't pretty: A babble of come-ons and lies from hucksters and con artists. To find your real e-mail, you must wade through the torrent of fraud and obscenity known politely as "unsolicited bulk e-mail" and colloquially as "spam." In a perverse tribute to the power of the online revolution, we are all suddenly getting the same mail: easy weight loss, get-rich-quick schemes, etc. The crush of these messages is now numbered in billions per day. "It's becoming 10 a major systems and engineering and network problem," says one e-mail expert. "Spammers are gaining control of the Internet."</p> <p><u>Passage 2:</u> Many people who hate spam assume that it is protected as free speech. Not necessarily so. The United States Supreme Court has previously ruled that individuals may preserve a threshold of privacy. "Nothing in the Constitution compels us to listen to or view any unwanted communication, whatever its merit," wrote Chief Justice Warren Burger in a 1970 decision. "We therefore categorically reject the argument that a vendor has a right to send unwanted material into the home of another." With regard to a seemingly similar problem, the Telephone Consumer Protection Act of 1991 made it illegal in the United States to send unsolicited faxes; why not extend the act to include unsolicited bulk e-mail?</p> <p>The primary purpose of Passage 1 is to</p> <ul style="list-style-type: none"> - make a comparison - dispute a hypothesis - settle a controversy - justify a distinction - highlight a concern <p>Unlike the author of Passage 1, the author of Passage 2</p> <ul style="list-style-type: none"> - criticizes a practice - offers an example - proposes a solution - states an opinion - quotes an expert

psychology who received course credit, and no participant took part in more than one study. Reading habits and preferences were measured with both self-report and recognition measures of print exposure. Verbal ability was operationalized as synonym recognition (Study 1), analogical reasoning (Study 2), sentence completion (Study 3), and reading comprehension (Study 4). To increase the ecological validity of our research we used items from a standardized test for Studies 2 through 4: the Student Achievement Test (SAT). Scores on the SAT are a key criterion for admission to many American universities, an important life outcome. It is important to note that partial correlations were employed to examine whether fiction or nonfiction uniquely predicts verbal abilities after controlling for shared variance. Demographic variables were also controlled to further explore the robustness of any associations observed, including gender, age, and self-reported years of English fluency. Example items for dependent measures appear in [Table 2](#) and descriptives for all variables are reported in [Table 3](#).

TABLE 3
Descriptives and Internal Reliabilities for Measures

<i>Study</i>	<i>Measure</i>	<i>Min.</i>	<i>Max.</i>	<i>M</i>	<i>SD</i>	α	<i>Skewness (SE)</i>	<i>Kurtosis (SE)</i>
1	SR fiction	1	8.00	5.09	1.48	.70	-.48 (.13)	-.32 (.27)
	SR nonfiction	1	9.00	3.59	1.73	.75	.49 (.13)	-.53 (.27)
	ART fiction	0	61	9.33	9.67	.92	1.94 (.13)	4.54 (.26)
	ART nonfiction	0	32	4.16	4.93	.87	2.31 (.13)	7.22 (.26)
	ART foils	0	24	1.40	2.93	.87	3.52 (.13)	16.31 (.26)
	Fiction-foils	-1	50	7.92	7.57		1.73 (.13)	4.12 (.26)
	Nonfiction-foils	-3	17	2.76	2.96		1.47 (.13)	2.99 (.26)
	Synonyms	2	53	21.50	10.38	.91	.85 (.13)	.54 (.26)
2	SR fiction	1	7.67	5.06	1.50	.77	-.38 (.16)	-.31 (.32)
	SR nonfiction	1	7.67	3.69	1.61	.71	.26 (.16)	-.76 (.32)
	ART fiction	0	49	7.01	8.41	.92	2.39 (.16)	6.45 (.32)
	ART nonfiction	0	27	3.15	3.90	.84	2.85 (.16)	11.72 (.32)
	ART foils	0	22	0.81	2.11	.85	5.89 (.16)	48.47 (.32)
	Fiction-foils	-2	49	6.21	7.24		2.33 (.16)	7.10 (.32)
	Nonfiction-foils	-4	16	2.35	2.66		1.61 (.16)	4.68 (.32)
	Analogies	6	19	12.92	2.72	.60	-.29 (.16)	.60 (.32)
3	SR fiction	1	7.67	4.76	1.66	.81	-.42 (.16)	-.58 (.33)
	SR nonfiction	1	7.67	4.03	1.59	.74	.19 (.16)	-.72 (.33)
	ART fiction	0	69	6.61	8.19	.92	3.59 (.16)	20.12 (.33)
	ART nonfiction	0	36	3.08	4.32	.88	4.38 (.16)	26.85 (.33)
	ART foils	0	24	0.96	2.64	.89	5.93 (.16)	43.19 (.33)
	Fiction-foils	-1	45	5.66	6.25		2.35 (.16)	8.62 (.33)
	Nonfiction-foils	-1	12	2.12	2.32		1.61 (.16)	3.57 (.33)
	Sentence completion	3	26	14.59	5.03	.81	.05 (.16)	-.71 (.33)
4	SR fiction	1	7.67	5.06	1.53	.77	-.39 (.18)	-.36 (.37)
	SR nonfiction	1	7.67	3.46	1.52	.68	.34 (.18)	-.67 (.37)
	ART fiction	0	56	6.57	9.01	.94	2.96 (.18)	10.47 (.37)
	ART nonfiction	0	37	3.12	4.29	.88	4.18 (.18)	25.28 (.37)
	ART foils	0	22	.68	2.17	.88	6.52 (.18)	55.68 (.37)
	Fiction-foils	-2	45	5.89	7.76		2.59 (.18)	7.49 (.37)
	Nonfiction-foils	-2	17	2.44	2.90		2.39 (.18)	8.11 (.37)
	Reading comprehension	0	6	3.72	1.46	.53	-.35 (.18)	-.12 (.37)

Note. SR = self-reported; ART = Author Recognition Test; α = Cronbach's alpha.

Study 1

Methods. Self-reported reading habits were measured using a six-item questionnaire, with three items for each genre (Table 2). This measure has been found to predict book-buying intentions (Rain & Mar, 2014).

Lifetime exposure to print was assessed using a modified version of the Author Recognition Test (ART; Fong, Mullin, & Mar, 2013), originally developed by Stanovich and colleagues (Cunningham & Stanovich, 1990; Stanovich & West, 1989), in which respondents are asked to accurately recognize the names of fiction and nonfiction authors (targets) from the names of nonauthors (foils). By employing a signal-detection logic, this measure attenuates problems pertaining to social desirability. Although not a direct measure of reading habits, print exposure

correlates highly with book reading and reading behaviors (West et al., 1993) and exhibits validity that is superior to self-report questionnaires (Mol & Bus, 2011; Sénéchal, LeFevre, Hudson, & Lawson, 1996) and equivalent to that of daily diary approaches (Allen, Cipielewski & Stanovich, 1992). Other studies have determined that recognition tests can distinguish between exposure to different types of texts (Sénéchal et al., 1996; Stainthorp, 1997). The version employed here presented 110 fiction author names, 50 nonfiction author names, and 40 foils (see the appendix). The number of foils checked was subtracted from the number of targets creating scores adjusted for indiscriminate guessing (Stanovich & West, 1989). This version of the ART has been found to predict greater interpersonal sensitivity (Fong et al., 2013).

Verbal ability was measured using a 60-item multiple-choice test of synonym knowledge (Table 2; full stimulus materials available upon request).

Results and discussion. Based on Pearson correlations, self-reported fiction preference predicted better performance on the synonyms measure (Table 4 presents all correlations and partial correlations). Nonfiction preference, on the other hand, was a weaker and statistically nonsignificant predictor.¹ To examine unique associations for each genre and control for individual differences, partial correlations were conducted. Gender, age, and English fluency were entered as controls, along with self-reported nonfiction preference, resulting in a positive prediction of synonym scores by self-reported fiction preference. A parallel analysis, controlling for fiction preference and examining nonfiction as the predictor, found that the association between self-reported nonfiction preference and synonym scores was weak and near zero.

Turning to the print-exposure measures, fiction print exposure predicted performance on the synonym measure. Nonfiction print exposure also predicted synonym performance, although the association was weaker (almost half the magnitude).¹ Partial correlations were undertaken to examine unique prediction and control for individual differences. Controlling for nonfiction targets, foils, gender, age, and English fluency, the checking of fiction targets (unadjusted, to prevent controlling for foils twice) predicted better synonym performance. A parallel analysis examining the predictive power of nonfiction targets (controlling for fiction targets and the other control variables) found a weak and statistically nonsignificant association with synonym knowledge.

Study 2

Methods. Reading measures were identical to Study 1 except that two fiction targets from the ART were removed from the analysis due to typos. Verbal ability was measured with 20 items from the analogy subtest of the SAT (Table 2).

Results and discussion. Zero-order correlations demonstrated that self-reported fiction preference was only weakly, and not statistically significantly, associated with performance on the analogy items (Table 4). Self-reported nonfiction preference was also weakly positively, but not statistically significantly, related to analogy performance.¹ A partial correlation controlling for the same variables in Study 1 found that fiction preference was a weak predictor of analogy performance with a confidence interval that includes zero. A parallel analysis, controlling for

¹Correlations corrected for attenuation due to internal reliability exhibited the same pattern of results (Schmitt, 1996). For details, please ask the authors.

TABLE 4
Correlations and Partial Correlations Between Verbal Ability Measures and Both Print-Exposure and Self-Reported Reading Preferences

	<i>SR-Fiction</i>	<i>SR-Nonfiction</i>	<i>ART-Fiction</i>	<i>Art-Nonfiction</i>
Study 1 (Synonyms)	$r = .23, p < .001$ (.12, .33) $pr = .32, p < .001$ (.22, .42)	$r = .08, p = .14$ (-.02, .18) $pr = .04, p = .46$ (-.07, .17)	$r = .32, p < .001$ (.21, .43) $pr = .35, p < .001$ (.21, .48)	$r = .17, p = .002$ (.06, .29) $pr = -.03, p = .56$ (-.16, .10)
Study 2 (Analogies)	$r = .09, p = .18$ (-.05, .22) $pr = .11, p = .09$ (-.03, .25)	$r = .05, p = .50$ (-.08, .17) $pr = .06, p = .34$ (-.07, .20)	$r = .13, p = .05$ (-.01, .26) $pr = .17, p = .01$ (.02, .31)	$r = .08, p = .22$ (-.04, .21) $pr = .01, p = .88$ (-.12, .14)
Study 3 (Sentence completion)	$r = .23, p < .001$ (.09, .37) $pr = .31, p < .001$ (.18, .44)	$r = .11, p = .11$ (-.01, .23) $pr = .19, p < .005$ (.05, .33)	$r = .16, p = .02$ (.02, .31) $pr = .35, p < .001$ (.22, .46)	$r = .08, p = .25$ (-.07, .22) $pr = .02, p = .76$ (-.13, .16)
Study 4 (Reading completion)	$r = .20, p = .01$ (.04, .34) $pr = .22, p = .004$ (.06, .37)	$r = .04, p = .59$ (-.10, .19) $pr = .09, p = .27$ (-.08, .25)	$r = .26, p = .001$ (.13, .40) $pr = .32, p < .001$ (.15, .47)	$r = .07, p = .35$ (-.08, .22) $pr = -.15, p = .05$ (-.31, .00)

Note. 95% confidence intervals presented in parentheses are bootstrapped, bias-corrected, and accelerated, based on 1,000 bootstrap resamples. Partial correlations are controlling for gender, age, years of English fluency, foil checking, and the other genre (nonfiction in the case of fiction and vice versa). Correlations are bold when confidence intervals do not include zero. Nonparametric correlations show the same pattern of associations (please ask authors for details). SR = self-report, ART = Author Recognition Test.

fiction preference along with demographics, demonstrated that self-report nonfiction preference was also a poor predictor of analogy performance.

For the print-exposure measures, fiction print-exposure predicted analogy performance but this association fell just above threshold for statistical significance with a confidence interval that includes zero. Nonfiction print exposure demonstrated even weaker prediction (see footnote 1). A partial correlation controlling for the same variables as before found that fiction print exposure predicted analogy performance. The same was not true for nonfiction print exposure, however. Once fiction print exposure was controlled for along with the demographic variables, nonfiction print exposure did not predict analogy performance.

Study 3

Methods. Self-reported reading habits and print exposure were measured as in Study 2. Verbal ability was measured using 28 sentence completion items from the verbal section of the SAT (Table 2).

Results and discussion. Self-reported fiction preference correlated with better performance on the sentence-completion items (Table 4). In contrast, nonfiction preference was a weaker and statistically nonsignificant predictor with a confidence interval that includes zero (see footnote 1). Partial correlations controlling for demographics and nonfiction preference found

that fiction remained a positive predictor of sentence completion ability. A parallel analysis for nonfiction preference (controlling for fiction preference and demographics) also demonstrated positive prediction of sentence completion ability, but to a lesser degree.

When print exposure was examined, exposure to fiction was found to predict sentence completion in zero-order correlation. Nonfiction exposure, in contrast, was not a strong predictor (see footnote 1).

After controlling for nonfiction targets, foil checking, and demographics, partial correlations revealed that fiction print exposure predicts sentence completion performance. The same analysis substituting nonfiction print exposure as the predictor and controlling for fiction exposure along with individual differences failed to demonstrate an association.

Study 4

Methods. Reading measures were the same as in Study 2. Verbal ability was measured using items gathered from the reading comprehension section of the SAT (see Table 2). Participants read three passages and answered 13 questions. However, this measure had very low reliability (Cronbach's $\alpha = .33$) as a result of seven questions associated with one passage. This passage was an excerpt from a Victorian novel, written in a style likely unfamiliar to most undergraduates. Worse, a brief description of the context in the novel was mistakenly omitted. Removing these questions improved the reliability of this measure (Table 3) and the performance of participants. The remaining two passages were both nonfiction in nature and corresponded to six questions.

Results and discussion. Self-reported preference for fiction predicted better reading comprehension. In contrast, nonfiction preference was not a strong predictor of performance on these items (see footnote 1). When partial correlations were employed as in the other studies, self-reported fiction preference remained a positive predictor of reading comprehension. Repeating this analysis with nonfiction preference revealed a weak and statistically nonsignificant association with reading comprehension.

Print-exposure measures of reading habits revealed a similar pattern. In zero-order correlation, fiction print exposure predicted better scores on the reading comprehension measure. Exposure to nonfiction, on the other hand, was a far weaker and statistically nonsignificant predictor. Partial correlations found that exposure to fiction remained a robust predictor of reading comprehension. The same could not be said of nonfiction print exposure, which was a negative predictor of reading comprehension after controlling for fiction targets, foil checking, gender, age, and English fluency.

DISCUSSION

Across four studies, preference and exposure to narrative fiction were stronger predictors of verbal ability than expository nonfiction. Once the shared variance between fiction and nonfiction was taken into account, fiction remained a unique predictor of verbal ability, but this was not consistently observed for nonfiction; nonfiction often failed to predict or became a negative predictor in partial correlations. This pattern of associations persisted across both self-reported reading habits and recognition measures of print exposure. Notably, the print-exposure measures

of fiction and nonfiction were positively correlated ($r_s = .56-.69$ across studies), so the fact that the two genres were differentially associated with verbal abilities is surprising. The effects were more pronounced for our print-exposure measures, in line with previous demonstrations that these checklists have greater validity than self-report questionnaires (Mol & Bus, 2011; Sénéchal et al., 1996). The same pattern of results was observed across a wide variety of verbal ability measures, from the level of individual words (i.e., synonyms), through relationships between word meanings (i.e., analogies) and sentence-level comprehension (i.e., sentence completion), and finally to aspects of discourse comprehension. Moreover, these results were robust, persisting even after accounting for the variance associated with demographic variables (i.e., gender, age, years of English fluency). The magnitude of these effects fall within the middle third of effect sizes that are typically observed within psychology (Hemphill, 2003; Meyer et al., 2001).

Although the replication of these findings across various measures increases our confidence in the presence of the phenomenon, there are limitations to our research. For one, the correlational nature of these studies does not allow for causal inferences, a common problem for studies of reading and verbal abilities. Constructs left unmeasured could provide an alternative explanation of our associations, such as general cognitive ability. There are reasons to believe that general intelligence is not a likely explanation, however. A previous study found that both fiction and nonfiction print exposure were only weakly related to general intelligence, with fiction being a negative predictor (Osana et al., 2007). Future work should measure additional constructs and include them in a simultaneous analysis. A longitudinal experimental design would also permit inferences regarding causal associations. Our sample is also not representative of the general population, but rather an educated university population. It remains to be seen whether what we observed holds true across age groups, like the general association between reading and verbal ability (Mol & Bus, 2011). Last, subsets of items from the SAT were employed here; using complete tests would improve the ecological validity of this research.

One important consideration is whether the results observed are a function of differences in measurement sensitivity for the two genres. Although the fiction print exposure measure had more items and greater variance relative to nonfiction, the same cannot be said for the self-report measures, yet the latter exhibited the same pattern of results. Moreover, disattenuated correlations correcting for differences in internal reliability also revealed an identical pattern of associations. In a previous study, this same measure of nonfiction print exposure positively predicted outcomes related to loneliness whereas a measure of fiction print exposure did not (Mar, Oatley, & Peterson, 2009). It does not appear to be the case that this print-exposure measure of nonfiction lacks the ability to predict other constructs relative to similar measures of narrative fiction.

Although the current work cannot speak to any potential mechanism, there are a multitude of possible explanations that could be explored in future research, such as those discussed in our introduction. Testing these possible explanations makes sense only once we have sufficient evidence that narrative fiction and expository nonfiction are differently related to verbal ability. The four studies presented here help to increase our confidence that such a phenomenon does appear to exist among young adults. The current data indicate that what we read may be just as important to consider as how much we read when it comes to developing our verbal abilities.

REFERENCES

- Acheson, D. J., Wells, J. B., & MacDonald, M. C. (2008). New and updated tests of print exposure and reading abilities in college students. *Behavior Research Methods*, *40*, 278–289. doi:10.3758/brm.40.1.278
- Allen, L., Cipielewski, J., & Stanovich, K. E. (1992). Multiple indicators of children's reading habits and attitudes: Construct validity and cognitive correlates. *Journal of Educational Psychology*, *84*, 489–503. doi:10.1037/0022-0663.84.4.489
- Barthes, R. (1982). Introduction to the structural analysis of narratives. In S. Sontag (Ed.), *A Barthes reader* (pp. 251–295). New York, NY: Hill and Wang.
- Bruner, J. (1986). *Actual minds, possible worlds*. Cambridge, MA: Harvard University Press.
- Burt, J. S., & Fury, M. B. (2000). Spelling in adults: The role of reading skills and experience. *Reading and Writing*, *13*, 1–30. doi:10.1023/A:1008071802996
- Cipielewski, J., & Stanovich, K. E. (1992). Predicting growth in reading ability from children's exposure to print. *Journal of Experimental Child Psychology*, *54*, 74–89. doi:10.1016/0022-0965(92)90018-2
- Cunningham, A. E., & Stanovich, K. E. (1990). Assessing print exposure and orthographic processing skill in children: A quick measure of reading experience. *Journal of Educational Psychology*, *82*, 733–740. doi:10.1037/0022-0663.82.4.733
- Cunningham, A. E., & Stanovich, K. E. (1991). Tracking the unique effects of print exposure in children: Associations with vocabulary, general knowledge, and spelling. *Journal of Educational Psychology*, *83*, 264–274. doi:10.1037/0022-0663.83.2.264
- Cunningham, A. E., & Stanovich, K. E. (1997). Early reading acquisition and its relation to reading experience and ability 10 years later. *Developmental Psychology*, *33*, 934–945. doi:10.1037/0012-1649.33.6.934
- Davide, N. J., de Jong, M. T., Bus, A. G., Huijbregts, S. C. J., & Swaab, H. (2011). Cognitive and environmental predictors of early literacy skills. *Reading and Writing*, *24*, 395–412. doi:10.1007/s11145-010-9233-3
- Ecalte, J., & Magnan, A. (2008). Relations between print exposure and literacy skills: New evidence from grade 1-5. *British Journal of Developmental Psychology*, *26*, 525–544. doi:10.1348/026151007X267959
- Fong, K., Mullin, J. B., & Mar, R. A. (2013). What you read matters: The role of fiction genre in predicting interpersonal sensitivity. *Psychology of Aesthetics, Creativity, and the Arts*, *7*, 370–376. doi:10.1037/a0034084
- Gardner, D. (2004). Vocabulary input through extensive reading: A comparison of words found in children's narrative and expository reading materials. *Applied Linguistics*, *25*, 1–37. doi:10.1093/applin/25.1.1
- Gerrig, R. J. (1993). *Experiencing narrative worlds*. New Haven, CT: Yale University Press.
- Graesser, A. C., Hautf-Smith, K., Cohen, A. D., & Pyles, L. D. (1980). Advanced outlines, familiarity, and text genre on retention of prose. *The Journal of Experimental Education*, *48*, 281–290. doi:10.1080/00220973.1980.11011745
- Hemphill, J. F. (2003). Interpreting the magnitudes of correlation coefficients. *American Psychologist*, *58*, 78–79. doi:10.1037/0003-066X.58.1.78
- Kintsch, W., & Young, S. R. (1984). Selective recall of decision-relevant information from texts. *Memory & Cognition*, *12*, 112–117. doi:10.3758/BF03198424
- Lawrence, J. F. (2009). Summer reading: Predicting adolescent word learning from aptitude, time spent reading, and text type. *Reading Psychology*, *30*, 445–465. doi:10.1080/02702710802412008
- Mar, R. A., Oatley, K., Hirsh, J., dela Paz, J., & Peterson, J. B. (2006). Bookworms versus nerds: Exposure to fiction versus non-fiction, divergent associations with social ability, and the simulation of fictional social worlds. *Journal of Research in Personality*, *40*, 694–712. doi:10.1016/j.jrp.2005.08.002
- Mar, R. A., Oatley, K., & Peterson, J. B. (2009). Exploring the link between reading fiction and empathy: Ruling out individual differences and examining outcomes. *Communications*, *34*, 407–428. doi:10.1515/comm.2009.025
- Martin-Chang, S. L., & Gould, O. N. (2008). Revisiting print exposure: Exploring differential links to vocabulary, comprehension and reading rate. *Journal of Research in Reading*, *31*, 273–284. doi:10.1111/j.1467-9817.2008.00371.x
- McGeown, S. P., Duncan, L. G., Griffiths, Y., & Stothard, S. E. (2015). Exploring the relationship between adolescents' reading skills, reading motivation and reading habits. *Reading and Writing: An Interdisciplinary Journal*, *28*, 545–569. doi:10.1007/s11145-014-9537-9
- Meyer, G. J., Finn, S. E., Eyde, L. D., Kay, G. G., Moreland, K. L., Dies, R. R., . . . Reed, G. M. (2001). Psychological testing and psychological assessment: A review of evidence and issues. *American Psychologist*, *56*, 128–165. doi:10.1037/0003-066x.56.2.128

- Mol, S. E., & Bus, A. G. (2011). To read or not to read: A meta-analysis of print exposure from infancy to early adulthood. *Psychological Bulletin*, *137*, 267–296. doi:10.1037/a0021890
- Nation, P., & Waring, R. (1997). Vocabulary size, text coverage and word lists. In N. Schmitt & M. McCarthy (Eds.), *Vocabulary: Description, acquisition and pedagogy* (pp. 6–19). Cambridge, UK: Cambridge University Press.
- Oatley, K. (1999). Why fiction may be twice as true as fact: Fiction as cognitive and emotional simulation. *Review of General Psychology*, *3*, 101–117. doi:10.1037/1089-2680.3.2.101
- Osana, H. P., Lacroix, G. L., Tucker, B. J., Idan, E., & Jabbour, G. W. (2007). The impact of print exposure quality and inference construction on syllogistic reasoning. *Journal of Educational Psychology*, *99*, 888–902. doi:10.1037/0022-0663.99.4.888
- Petros, T. V., Bentz, B., Hammes, K., & Zehr, H. D. (1990). The components of text that influence reading times and recall in skilled and less skilled college readers. *Discourse Processes*, *13*, 387–400. doi:10.1080/01638539009544767
- Rain, M., & Mar, R. A. (2014). Measuring reading behavior: Examining the predictive validity of print-exposure checklists. *Empirical Studies of the Arts*, *32*, 93–108. doi:10.2190/EM.32.1f
- Rozin, P. (2009). What kind of empirical research should we publish, fund, and reward? A different perspective. *Perspectives on Psychological Science*, *4*, 435–439. doi:10.1111/j.1745-6924.2009.01151.x
- Schmitt, N. (1996). Uses and abuses of coefficient alpha. *Psychological Assessment*, *8*, 350–353. doi:10.1037/1040-3590.8.4.350
- Sénéchal, M., LeFevre, J., Hudson, E., & Lawson, E. P. (1996). Knowledge of storybooks as a predictor of young children's vocabulary. *Journal of Educational Psychology*, *88*, 520–536. doi:10.1037/0022-0663.88.3.520
- Sparks, R. L., Patton, J., & Murdoch, A. (2014). Early reading success and its relationship to reading achievement and reading volume: Replication of '10 years later'. *Reading and Writing*, *27*(1), 189–211. doi:10.1007/s11145-013-9439-2
- Spear-Swerling, L., Brucker, P. O., & Alfano, M. P. (2010). Relationships between sixth-graders' reading comprehension and two different measures of print exposure. *Reading and Writing*, *23*, 73–96. doi:10.1007/s11145-008-9152-8
- Stainthorp, R. (1997). A children's Author Recognition Test: A useful tool in reading research. *Journal of Research in Reading*, *20*, 148–158. doi:10.1111/1467-9817.00027
- Stanovich, K. E., & Cunningham, A. (1992). Studying the consequences of literacy within a literate society: The cognitive correlates of print exposure. *Memory & Cognition*, *20*, 51–68. doi:10.3758/BF03208254
- Stanovich, K. E., & West, R. F. (1989). Exposure to print and orthographic processing. *Reading Research Quarterly*, *24*, 402–433. doi:10.2307/747605
- Steiger, J. H. (1980). Tests for comparing elements of a correlation matrix. *Psychological Bulletin*, *87*, 245–251. doi:10.1037/0033-2909.87.2.245
- West, R. F., Stanovich, K. E., & Mitchell, H. R. (1993). Reading in the real world and its correlates. *Reading Research Quarterly*, *28*, 34–50. doi:10.2307/747815

APPENDIX

TABLE A1
Items for the Author Recognition Test by Genre and Sub-Genre

<i>FICTION</i> <i>Subgenre</i>	<i>Name</i>	<i>FICTION</i> <i>Subgenre</i>	<i>Name</i>
Domestic	Alice Munro	Romance	Emily Giffin
Domestic	Alice Sebold	Romance	Fern Michaels
Domestic	Amy Tan	Romance	Iris Johansen
Domestic	Carol Shields	Romance	Jackie Collins
Domestic	Christopher Moore	Romance	Jayne Ann Krentz
Domestic	Chuck Palahniuk	Romance	Jo Davis
Domestic	Douglas Coupland	Romance	Joy Fielding
Domestic	Gregory Maguire	Romance	Jude Deveraux
Domestic	J. D. Sallinger	Romance	Judith Krantz
Domestic	Jodi Picoult	Romance	Julia London
Domestic	John Irving	Romance	Karen Marie Moning
Domestic	John Steinbeck	Romance	Lisa Kleypas
Domestic	John Updike	Romance	Meg Cabot
Domestic	Joseph Heller	Romance	Nicholas Sparks
Domestic	Maeve Binchy	Romance	Nora Roberts
Domestic	Philippa Gregory	Romance	Sandra Brown
Domestic	Rohinton Mistry	Romance	Sherrilyn Kenyon
Domestic	Sinclair Ross	Romance	Sidney Sheldon
Domestic	Timothy Findley	Romance	Sophie Kinsella
Domestic	Tom Robbins	Sci-Fi/Fantasy	Alastair Reynolds
Domestic	Toni Morrison	Sci-Fi/Fantasy	Anne McCaffrey
Domestic	W. O. Mitchell	Sci-Fi/Fantasy	Arthur C. Clarke
Domestic	Wally Lamb	Sci-Fi/Fantasy	Douglas Adams
Domestic	William Faulkner	Sci-Fi/Fantasy	Frank Herbert
Domestic	Yann Martel	Sci-Fi/Fantasy	George R. R. Martin
Foreign	Albert Camus	Sci-Fi/Fantasy	Greg Bear
Foreign	Gabriel Garcia Marquez	Sci-Fi/Fantasy	Jacqueline Carey
Foreign	Italo Calvino	Sci-Fi/Fantasy	Jim Butcher
Foreign	José Saramago	Sci-Fi/Fantasy	Kim Harrison
Foreign	Milan Kundera	Sci-Fi/Fantasy	Larry Niven
Foreign	Paulo Coelho	Sci-Fi/Fantasy	Margaret Weis
Foreign	Thomas Mann	Sci-Fi/Fantasy	Neil Gaiman
Foreign	Umberto Eco	Sci-Fi/Fantasy	Orson Scott Card
Foreign	W. G. Sebald	Sci-Fi/Fantasy	Philip K. Dick
Foreign	Yukio Mishima	Sci-Fi/Fantasy	Piers Anthony
Romance	Audrey Niffenegger	Sci-Fi/Fantasy	R. A. Salvatore
Romance	Catherine Anderson	Sci-Fi/Fantasy	Ray Bradbury
Romance	Charlaine Harris	Sci-Fi/Fantasy	Robert A. Heinlein
Romance	Danielle Steele	Sci-Fi/Fantasy	Robert Jordan
Romance	Diana Gabaldon	Sci-Fi/Fantasy	Terry Brooks
Romance	Diana Palmer	Sci-Fi/Fantasy	Terry Goodkind

(Continued)

TABLE A1
(Continued)

<i>FICTION</i>		<i>NONFICTION</i>	
<i>Subgenre</i>	<i>Name</i>	<i>Subgenre</i>	<i>Name</i>
Sci-Fi/Fantasy	Terry Pratchett	Business	Barry Z. Posner
Sci-Fi/Fantasy	Ursula K. Le Guin	Business	Faith Popcorn
Sci-Fi/Fantasy	William Gibson	Business	Jim Collins
Suspense	Cathy Reichs	Business	Kenneth H. Blanchard
Suspense	Clive Cussler	Business	M. D. Johnson Spencer
Suspense	Dean Koontz	Business	Napoleon Hill
Suspense	Dick Francis	Business	Peter F. Drucker
Suspense	Donna Leon	Business	Peter S. Pande
Suspense	Harlan Coben	Business	Robert T. Kiyosaki
Suspense	Ian Rankin	Business	Stephen C. Lundin
Suspense	Jack Higgins	Philosophy/Psychology	Antonio Damasio
Suspense	James Patterson	Philosophy/Psychology	Bertrand Russell
Suspense	Jeffrey Deaver	Philosophy/Psychology	Daniel Goleman
Suspense	John Grisham	Philosophy/Psychology	Jean Baudrillard
Suspense	John LeCarré	Philosophy/Psychology	Jeffrey Gray
Suspense	John Saul	Philosophy/Psychology	John Searle
Suspense	Jonathan Kellerman	Philosophy/Psychology	Joseph LeDoux
Suspense	Ken Follett	Philosophy/Psychology	Michel Foucault
Suspense	Mary Higgins Clark	Philosophy/Psychology	Oliver Sacks
Suspense	Michael Connelly	Philosophy/Psychology	Roland Barthes
Suspense	Michael Jecks	Science	Amir D. Aczel
Suspense	Nelson DeMille	Science	Diane Ackerman
Suspense	P. D. James	Science	Douglas Rushkoff
Suspense	Patricia Cornwell	Science	Ernst Mayr
Suspense	Robert B. Parker	Science	John Maynard Smith
Suspense	Robert Ludlum	Science	Matt Ridley
Suspense	Sue Grafton	Science	Richard Dawkins
Suspense	Vince Flynn	Science	Stephen Hawking
		Science	Stephen J. Gould
		Science	Thomas Kuhn
		Self-Help	Deepak Chopra
		Self-Help	Erma Bombeck
		Self-Help	Jack Canfield
		Self-Help	Jean Vanier
		Self-Help	M. Scott Peck
		Self-Help	Marianne Williamson
		Self-Help	Melody Beattie
		Self-Help	Philip C. McGraw
		Self-Help	Robert Fulghum
		Self-Help	Stephen R. Covey

(Continued)

TABLE A1
(Continued)

<i>NONFICTION</i> <i>Subgenre</i>	<i>Name</i>	<i>FOILS</i> <i>Names</i>
Social/Political Commentary	Bob Woodward	Aimee Emery
Social/Political Commentary	Eric Schlosser	Alister Yussen
Social/Political Commentary	Michael Moore	Carl Daniels
Social/Political Commentary	Naomi Klein	Dale Blass
Social/Political Commentary	Naomi Wolf	David Passman
Social/Political Commentary	Noam Chomsky	Denise Cuneo
Social/Political Commentary	Norman Mailer	Diane Corter
Social/Political Commentary	Pierre Berton	Edward Condry
Social/Political Commentary	Robert D. Kaplan	Elliot Bever
Social/Political Commentary	Susan Sontag	Eric Adamson
		Frances Gresham
		Frank Bluth
		Frank Killarney
		Franklin D. Manis
		Gary Baron
		Geraldine Dickson
		Harold Gallivan
		Hilda Blyth
		Hugh Liben
		James Mendelson
		Jonathan T. Cortes
		K. Warner Sexton
		Lauren Amsel
		Lynn H. Larson
		Margaritia Barrera
		Mark Sorenson
		Martin Faulkner
		Miriam Schaie
		Morton Lytton
		Oscar Asmitia
		Reed Inness
		Reuben Beauchamp
		Richard Plath
		Robert Donahue
		Robert Irons
		Robert Saul
		Scott Parson
		Steve Yorel
		Thomas Borko
		W. Patrick Dawson