
A Longitudinal Study of Disciplinary Literacy Development in Literature and History as a Resource for Identity Development and Psycho-Social Well Being

Project READI Technical Report #11

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Project READI operated as a multi-institution collaboration among the Learning Sciences Research Institute, University of Illinois at Chicago; Northern Illinois University; Northwestern University; WestEd’s Strategic Literacy Initiative; and Inquirium, LLC. Project READI developed and researched interventions in collaboration with classroom teachers that were designed to improve reading comprehension through argumentation from multiple sources in literature, history, and the sciences appropriate for adolescent learners. Curriculum materials in the READI modules were developed based on enacted instruction and are intended as case examples of the READI approach to deep and meaningful disciplinary literacy and learning.

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The longitudinal project was designed with several propositions in mind. The first is that the challenges facing struggling adolescent readers certainly includes the need to develop particular cognitive strategies and epistemological orientations, as reflected in the broader READI goals (Goldman et al., 2016; C.D. Lee, Goldman, Levine, & Magliano, 2016; C. D. Lee & Spratley, 2009); but equally important are the social and emotional dimensions and psychological demands of developing new and challenging learning goals (Farrington et al., 2012; Luriia & Cole, 1976; Zajonc & Marcus, 1984). These social and emotional dimensions are influenced by one's perceptions of the self, the setting, the tasks before one (Dai & Sternberg, 2004; Markus & Kitayama, 1991; Weiner, 1985). These social and emotional dimensions entail identity processes – who am I individually, who am I in terms of gender, sexual orientation, class positioning, racial/ethnic positioning, who am I as a student, how do I understand my abilities, my goals, my motivations (Akos & Galassi, 2004; Graham & Hudley, 2005; C. D. Lee, 2002; Okeke, Howard, Kurtz-Costes, & Rowley, 2009). The second is that these social and emotional dimensions and identity processes take on a special significance with regard to positioning in terms of race/ethnicity and class (Boykin, 1986; Steele, Spencer, & Aronson, 2002). We worked from an ecological framework (Bronfenbrenner & Morris, 2006; Super & Harkness, 1986; Weisner, 1984), arguing that the developmental space the young people with whom we would be working was not limited to the classroom or the school alone. Rather, these young people are at a critical transition point in their development where navigating among multiple social spaces creates particular challenges: family life, peer social networks, neighborhood spaces, the instructional and social climate of individual classrooms as well as the climate of the school as an organization (Spencer, 2006; Swanson, Edwards, & Spencer, 2010). In high school, the school contexts become particularly challenging as students must learn to navigate across different classrooms, different teachers, an array of school staff from security guards to kitchen staff to school administrators, as well as the complexities of peer social networks both inside and outside of school. Thus, the design of the longitudinal intervention aimed to support the development of both intellectual dispositions and skills in terms of reading in the disciplines in tandem with supports for the development of positive sense of self in terms of racial identity (Chavous et al., 2003; Rowley, Sellers, Chavous, & Smith, 1998; Sellers, Caldwell, Schmeelk-Cone, & Zimmerman, 2003; Sellers, Chavous, & Cooke, 1998), perceptions of ability (Dweck, 2002; Eccles, 2005), and dispositions to persist in the face of challenge (American Psychological Association Task Force on Resilience and Strength in Black Children and Adolescents, 2008; Cappella & Weinstein, 2001; Spencer, 1987; Spencer et al., 2006). This broad conceptualization of the task then also informed our data collection and analyses.

The longitudinal study took place in an urban charter high school serving a predominantly low-income African-American population: 99% African-American; 94% Low-Income; 24% Special Education. It spanned over four academic terms: 2011-12 (grades 9 - 10); 2012-13 (grades 9 - 11); 2013-14 (grades 10 - 12); 2014-15 (grades 11 - 12). Overall, 275 students and 9 teachers provided consent for participation, with variation year by year. From year to year there was variation in the student cohort, reflecting attrition but in some cases also the addition of new students to a cohort. Table 1 provides a summary of the numbers of consented students during each year of the project. Table 2 reflects the number of students who participated multiple years for each cohort. Note that cohort is designated by year of graduation.

Table 1
Consented student participation by project year and year of graduation
Academic Year

Cohort by Year of Anticipated Graduation	2011-12 (152 Consented)	2012-13 (209 Consented)	2013-14 (179 Consented)	2014-15 (106 Consented)
Class of 2013		38	6**	
Class of 2014	80	65	69*	1***
Class of 2015	72	66	64	68*
Class of 2016		40	40	37

*The increase of 4 were students new to the project.

**These 6 students repeated their senior year and thus had 2 years of project participation.

***One student from the class of 2014 repeated the senior year and thus had 4 years of project participation.

Table 2
Years of participation in project for each cohort

Years of Project Participation	Class of 2013	Class of 2014	Class of 2015	Class of 2016
1	32	19*	10***	
2	6		2	3
3		65		37
4		1**	64	

*Reflects 15 who did not continue into their second year plus 4 students who were new to the project in 2013-2014.

**Repeating Senior

***Reflects 6 who failed to continue in 2nd year of project plus 4 who joined the project in 2014-2015.

As well, and as discussed below, the project involved multiple data sources and not all students in a given year provided data on all of them. Thus, the numbers in Tables 1 and 2 reflect the maximum number of students for whom we have analyzable data in any given year. In actuality, there was fairly wide variation in the observations per measure per year. The analyses presented in this report are limited to single-year analyses. We have multiple years of data on a subset of students per cohort but we are still in process on these analyses.

The design entailed multiple components:

- Instructional practices primarily in literature and composition in English Language Arts classes and secondarily in history that embody the READI Learning Goals and address the core constructs in the READI Framework in each discipline.
- Instructional supports for teachers in ELA, other reading support classes, and history to transform pedagogical practices (See Appendix with core instructional practices)
- Additional school wide practices intended to support social and emotional development

The primary literacy focus was in literature. The pedagogical design was focused jointly on developing competencies in the 5 core constructs of the READI Framework (epistemology, key constructs, text types, discourse and language, strategies) for each of the two disciplines as intellectual resources in tandem with developing knowledge, dispositions and relationships that foster coping and resilience, positive construals of self and future possibilities (Oyserman, Bybee, & Terry, 2006). In literature, this meant selecting texts that posed interpretive problems that are central to the discipline (e.g. symbolism, irony, unreliable narration, satire) along with themes that are both archetypal and relevant to the life course challenges of this population (Hillocks, 2016; C. D. Lee, 2011). We hypothesized that the thematic foci invited personal identity wrestling and the strategic supports for addressing interpretive problems would build technical knowledge and dispositions that supported a sense of academic and intellectual self-efficacy. In history, this meant addressing historical dilemmas relevant to the historical and contemporary challenges of the African-American community in the U.S. history and civics classes (e.g. a unit on affirmative action in civics), designed in such a way that students were supported in interrogating multiple texts, again drawing on the READI core constructs. We had originally hoped to have integrated reading and argumentation in science, but the organizational challenges were too great for the school.

In addition to the literacy focus in ELA and History classes, for two years (2010-11; 2011-12), the intervention included a seminar class specifically focused on generic reading comprehension using expository texts that again addressed issues of social and emotional development for this population of students. In years one and two (2010 – 2012), the high school hired teachers for freshman and sophomore classes to teach the seminar. However, in the third year, ELA teachers taught the seminar using a digital program for generic reading – Reading Plus. This transition was made because the staff hired to teach seminar were not reading specialists, and despite supports from a project instructional coach, it proved difficult to organize instruction in ways that guided students in gaining generic reading skills. By the third year (2012 – 2013), the school administration felt it would be more productive to use an existing digital program that not only provided explicit instruction but also provided feedback data on student progress.

In order to provide supports for social and emotional development, two other initiatives were put in place, consistent with project goals but largely designed and driven by the school administration. The first was an advising system (2013-14; 2014-15) in which teachers were assigned a group of students with whom they were expected to meet once or twice a month, to monitor the students' academic progress (e.g. grades, attendance, disciplinary referrals, suspensions). The second was an enrichment program with extra-curricular clubs (African dance, yoga, chess, business entrepreneurship, male and female mentoring, debate, and Academic Decathlon). The Academic Decathlon program earned Rookie of the Year in its first iteration in a state wide competition. As one outgrowth of the intervention's focus on helping students expand their horizons about the usefulness of disciplinary literacies beyond the classroom, students worked in disciplinary teams to design research projects that they then presented the findings of at the 2015 meeting of the American Educational Research Association in Chicago. They garnered an audience of at least 100 people. Each project team designed an essential question that required gathering data from across multiple texts, evaluating the data and constructing oral and written arguments. Student projects were discipline focused in literature,

history, science and mathematics. Students, faculty, and parents were all very excited and proud of their presentations and the response from an audience of professors and researchers.

Data collection:

Dr. Margaret Beale Spencer (University of Chicago) and Dr. Davido DuPree (University of Pennsylvania) conducted a formative evaluation across the four years of the intervention. We have reported on their findings in each annual report. Data collection included instruments selected by Dr. Spencer and Dr. DuPree measuring identity variables relevant to the goals of the project along with process surveys of students' perceptions of instruction – specifically literacy practices associated with READI model and Cultural Modeling goals - and their overall experiences of school climate. In addition, the project collected data from surveys of students' experiences outside the school, measures of instructional climate by class, epistemology surveys in literature and history developed by Project READI, as well as close transfer essay exams on literary argumentation, and one assessment of historical argumentation. All measures have been statistically validated. The project also collected data on student grades, attendance, and PSAT scores.

Psycho-social measures included the following:

- The Hare Self-Esteem/Block Ego Resiliency (Hare, 1977) – A measure of academic self-esteem, general self-esteem, and resiliency
- Crocker Collective Self-Esteem (Luhtanen & Crocker, 1992) – A measure of collective and personal self-esteem
- Cross Racial Identity Scale (Vandiver, Cross Jr, Worrell, & Fhagen-Smith, 2002) A measure of racial identity profiles
- Seller's Oppressed Minority (Sellers, Rowley, Chavous, Shelton, & Smith, 1997) – A measure of the salience, centrality, regard of identity around race and ideology around race
- Stevenson's Cultural & Racial Experiences of Socialization
- Brief COPE (Carver, 1997) – A measure of coping reactions
- Dweck's Theories of Intelligence (Dweck, 1999) – A measure of beliefs about intelligence as malleable or fixed
- Imaginary Audience Scale (Mullis & Markstrom, 1986) – A measure of relationships between perceptions of the self and how adolescents imagine others see them

Measures of student life include the following:

- Social Network Survey (Coates, 1996) – A measure of peer, family and other social networks as a window into available sources of support; validated for African-American populations
- How I Learn (Kern & Coates, 1996) – A measure of adolescent perceptions of supports for achievement.
- Reading and Interests Survey (Schoenbach, Greenleaf, & Murphy, 2012)
- Genre Preferences (Schoenbach et al., 2012)
- School Peer Home (Hare, 1996)

Measures of perceptions of instruction include the following:

- Instructional Climate Inventory (Worrell, 2000) – A measure of the following attributes of school climate (Accomplishment – school makes me like to learn; Recognition – school praises me for good work; Power – doing well in school will help my future education; Commitment – I feel like I belong/ and measure of the strength of the climate)
- Project READI School Climate Scale – Questions developed by Spencer and DuPree to capture students’ perceptions of instructional practices associated with Cultural Modeling and READI practices
- TRIPOD (Ferguson, 2012) – A measure of students’ perceptions of instructional climate based on 7 constructs (care, confer, captivate, clarify, consolidate, challenge, control), validated by the Measures of Effective Teaching Project.

Measures of epistemology include the following:

- READI Literature Epistemology Scale (Yukhymenko-Lescroart et al., 2016) – A validated measure developed by Project READI with a two factor subscale – Multiple Meanings, Multiple Readings
- READI History Epistemology Scale – Developed by Project READI, a validated measure of epistemic cognition in history (e.g. beliefs that historical understanding is based on certainty, that history is subject to multiple explanations, and a sense of self-efficacy in understanding history and doing well in history in school). Report in preparation.

Measures of close reading and argumentation include the following:

- READI Literature EBaims (See Project READI Tech Report #10) – Measure of literary reasoning developed by Project READI. Students read two short stories that pose a common interpretive problem (e.g. symbolism) and theme (e.g. coming of age), complete a comprehension check list of key events, organize a graphic organizer to plan to respond to an author generalization question (e.g. a question about theme) and a structural generalization question (e.g. a question about how rhetorical and organizational choices by the author work to convey potential meanings) (Hillocks & Ludlow, 1984). Literature assessment evaluated using a 8 criteria rubric (e.g. claims, function of claims, evidence, reasoning, thematic abstraction, interpretive problem - e.g. symbolism - organization, synthesis).
- READI History EBaims (See Project READI Tech Report #10) – Measure of students’ abilities to infer a causal explanation of a historical event from multiple sources.

We also conducted talk aloud protocols to a small sample of students in 2014 in order to gain insights into micro-level processes students recruited in their efforts to interpret a short story that entailed symbolism and a coming of age theme.

In terms of process data, we video taped classrooms and collected samples of student work: 187 class periods across literature and history classes; student in-class essays and work from student portfolios. We have only begun to examine the process data, but anticipate focusing our efforts in 2016-17 on completing qualitative analyses in order to situate our quantitative findings. These include several hundred hours of classroom video recordings, multiple teacher and focus group interviews, multiple sets of collected student papers, results from the formal measures given, students’ GPAs, course grades and ACT standardized test composite scores and English and Reading section scores. We have created a digital Evidence Base Data Set for all of this data

that is searchable by date, by student, by category of data source. Thanks to our project manager Dr. James Buell for creating this unique digital, searchable database. This database will support our on-going analyses of this unique longitudinal database.

Overarching assumptions motivating the study

Reading comprehension is a form of ill structured problem solving (Kintsch, 1998; Rapp & van den Broek 2005; Simon, 1977; Simon & Newell, 1958; Spiro, 1980). Disciplinary reasoning with texts provide heuristics that focus such problem solving efforts in ways that invite generative problem solving (C. D. Lee & Spratley, 2009). For novice readers and especially struggling readers, the following conditions increase the likelihood that students will put forth the effort and persistence required to engage in such problem solving: making problem solving explicit (Collins, Brown, & Holum, 1991), drawing on relevant prior knowledge (Reynolds, Taylor, Steffensen, Shirey, & Anderson, 1982), socializing epistemological dispositions (Collins & Ferguson, 1993), scaffolding through modeling and guided support (Palincsar & Brown, 1984), designing for social and personal relationships (Goodenow, 1993), recruiting identity processes and language repertoires meaningful to students (C. D. Lee, 2007). The design of this longitudinal intervention sought to organize an intervention to meet these conditions, and thus its joint focus on both the cognitive as well as the socio-emotional and identity processes (conceptualizing who am I along multiple dimensions) entailed in learning to engage in the complex intellectual work of disciplinary reasoning and argumentation, most specifically in literary response.

Questions:

1. How do measures of psycho-social identity correlate with student outcomes: literature grades; PSAE scores; literature comprehension and writing skills on READI Literature EBAIMS?
2. How do measures of students' perceptions of instruction and school climate correlate with the following: homework as evidence of persistence, literature grades, PSAE scores, literature comprehension and writing skills on READI Literature EBAIMS?
3. What do the literature EBAIMS demonstrate about relations between skill in literary comprehension and the ability to convey literary arguments in writing and oral discourse?

As described earlier, the Literature EBAIMS sought to evaluate students' abilities to comprehend and interpret short stories and to convey those interpretations in well organized essays. The assessment always involved two stories in order to evaluate students' abilities not only to interrogate single texts, but to compare and contrast across stories, focusing on theme and the rhetorical and organizational choices made by authors and what such choices potentially conveyed. The rubric used to evaluate student essays included 8 criteria (e.g. claims, function of claims, evidence, reasoning, thematic abstraction, interpretive problem - e.g. symbolism - organization, synthesis). While we have analyses by criteria, it became useful to conduct analyses of correlations between skills on the essay and other variables of interest (e.g. epistemology, ACT scores, instructional climate measures, psycho-social measures, etc.). We thus conducted latent class analyses on the underlying constructs being measured by the essay assessment. In one analysis, we documented three factors (reasoning, evidence, writing). In a

second analyses, we documented two factors (literary comprehension and writing). In both analyses, this involved examining correlations among the 8 criteria on the rubric to infer underlying broader constructs. (See READI Tech Report #10, Appendix 3)

The Literature Epistemic Cognition Scale in its final version included three underlying subscales: The three subscales on the epistemological beliefs survey are (1) the extent to which students seeing literary works as open to multiple interpretations (multiple meanings); (2) the value placed on multiple readings for understanding literary works (multiple readings); (3) and agreement with the idea that literary works convey messages that are applicable in one's own life and can shed light on the human condition (relevance to life) (Yukhymenko-Lescroart et al., 2016). These constructs are well validated in research in literary theory and criticism (C.D. Lee et al., 2016). We argue that these are epistemic dispositions upon which expert readers of literature draw in structuring how they approach literary problem solving. Expert-novice studies of literary response document how expert readers draw on such dispositions (C.D. Lee et al., 2016). The data reported here involves the first iteration of the Literature Epistemic Cognition Scale, testing the three underlying subscales (multiple readings, multiple meanings, and relevance to life) and questions about students' sense of self-efficacy in interpreting literature.

Findings:

2013-14 Pre Post EBAIMS:

The following data document what epistemic literary dispositions students in the longitudinal study held and whether participation in the intervention was related to any changes in such epistemic literary dispositions.

Using Latent Class Analysis on the 8 - dimension rubric criteria for the essays, we determined three classes of student groups:

- Students in Class 1 are low on all dimensions (i.e., Reasoning, Evidence, Writing).
- Students in Class 2 are high on all dimensions (i.e., Reasoning, Evidence, Writing).
- Students in Class 3 are medium on the literary reasoning dimensions but relatively low on the writing and organization dimensions. In other words, they comprehend material better than they can write.

Next, we performed ANCOVAs for post scores on literature epistemological beliefs, controlling for pre. Literature epistemological beliefs scale includes three subscales: multiple meaning, multiple reading, and relevance to life.

Subscale 1: Multiple Meaning

Paired-Sample t-Test (for the total sample)

TOTAL: Pre-Post: $t(188) = 6.21, p < .001$

Conclusion: Students reported higher beliefs about multiple meaning after READI than before READI. These data suggest the intervention did impact students' beliefs about valuing the idea that literary texts can have multiple meanings.

Table 3
Descriptives for Multiple Meaning Pre-Post by Latent Class

Class	N	Pre		Post	
		M	SD	M	SD
Class 1: Low	33	3.88	0.75	4.19	0.51
Class 2: High	65	4.12	0.55	4.28	0.64
Class 3: Medium	51	4.08	0.57	4.48	0.44
Total	149	4.05	0.61	4.33	0.56

ANCOVA with Covariate for Pre

$R^2 = 26.3\%$, $F(5,143) = 10.21, p < .001, \eta_{\text{partial}}^2 = .263$

Between-Subject Effects:

Class: $F(2,143) = 3.77, p = .025, \eta_{\text{partial}}^2 = .05$

Pre Multiple Meaning: $F(1,143) = 7.97, p < .001, \eta_{\text{partial}}^2 = .19$

Class X Pre Multiple Meaning: $F(2,143) = 3.76, p = .026, \eta_{\text{partial}}^2 = .05$

Table 4
Dependent Variable: Post Multiple Meaning

	B	SE	t	P	95% CI		η_{partial}^2
					LL	UL	
Intercept	2.90	0.50	5.85	.000	1.92	3.88	0.19
Class 1: Low vs. Class 3: Medium	0.65	0.67	0.96	.337	-0.68	1.97	0.01
Class 2: High vs. Class 3: Medium	-1.10	0.67	-1.63	.105	-2.43	0.23	0.02
Class 1: Low vs. Class 2: High	1.75	0.64	2.72	.007	0.48	3.02	0.05
Pre Multiple Meaning	0.39	0.12	3.23	.002	0.15	0.63	0.07
Interaction Effects for Pre Multiple Meaning:							
Class 1: Low vs. Class 3: Medium	-0.22	0.17	-1.34	.183	-0.55	0.11	0.01
Class 2: High vs. Class 3: Medium	0.21	0.16	1.30	.195	-0.11	0.53	0.01
Class 1: Low vs. Class 2: High	-0.43	0.16	-2.74	.007	-0.75	-0.12	0.05

Conclusions: Pre scores predicted student Post scores. There were differences in pre scores across the three groups. Specifically, students in Class 2 (High) reported higher multiple meaning (pre) than students in Class 1 (Low). Also, there were differences in the post scores across the three groups. Specifically, students in Class 2 (High) reported higher multiple meaning (post) than students in Class 1 (Low). These findings suggest there are relationships between valuing multiple meanings in literary texts and demonstration of higher skills in literary interpretation.

Subscale 2: Multiple Reading

Paired-Sample t-Test

TOTAL: Pre-Post: $t(188) = 1.56, p = .121$

Conclusion: Student beliefs about multiple reading did not change as a result of READI. This finding likely is explained by teachers not actually engaging students in multiple readings of the same text, even though such practices were part of the conceptual design.

Table 5
Descriptives for Multiple Reading Pre-Post by Latent Class

Class	N	Pre		Post	
		M	SD	M	SD
Class 1: Low	33	1.98	0.77	1.95	0.82
Class 2: High	65	1.90	0.78	1.86	0.82
Class 3: Medium	51	2.00	0.83	1.96	0.85
Total	149	1.95	0.79	1.91	0.82

ANCOVA with Covariate for Pre

$R^2 = 35.1\%, F(5,143) = 15.45, p < .001, \eta_{\text{partial}}^2 = .35$

Between-Subject Effects:

Class: $F(2,143) = 1.79, p = .172$

Pre Multiple Reading: $F(1,143) = 73.40, p < .001, \eta_{\text{partial}}^2 = .34$

Class X Pre Multiple Reading: $F(2,143) = 2.36, p = .098$

Table 6***Dependent Variable: Post Multiple Reading***

	<i>B</i>	<i>SE</i>	<i>t</i>	<i>p</i>	95% CI		η_{partial}^2
					<i>LL</i>	<i>UL</i>	
Intercept	0.59	0.25	2.38	.019	0.10	1.08	0.04
Class 1: Low vs. Class 3: Medium	-0.21	0.41	-0.51	.614	-1.02	0.61	0.00
Class 2: High vs. Class 3: Medium	0.47	0.33	1.40	.164	-0.19	1.13	0.01
Class 1: Low vs. Class 2: High	-0.68	0.40	-1.70	.091	-1.46	0.11	0.02
Pre Multiple Reading	0.68	0.12	5.95	.000	0.46	0.91	0.20
Interaction Effects for Pre Multiple Reading:							
Class 1: Low vs. Class 3: Medium	0.11	0.19	0.55	.586	-0.28	0.49	0.00
Class 2: High vs. Class 3: Medium	-0.26	0.16	-1.66	.099	-0.58	0.05	0.02
Class 1: Low vs. Class 2: High	0.37	0.19	1.95	.054	-0.01	0.74	0.03

Conclusions: Pre scores predicted student Post scores. There were no differences in pre or post scores across the three groups.

Subscale 3: Relevance to Life**Paired-Sample t-Test**

TOTAL: Pre-Post: $t(188) = 2.38, p = .019$

Conclusion: Students reported higher beliefs about relevance of literature to life after READI than before READI. Considering the assumption in the design of the longitudinal intervention that the selection of texts was important as a resource for identity wrestling, this finding is promising.

Table 7***Descriptives for Social Functioning Pre-Post by Latent Class***

Class	<i>N</i>	Pre		Post	
		<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>
Class 1: Low	33	3.24	0.75	3.53	0.70
Class 2: High	65	3.55	0.76	3.57	0.82
Class 3: Medium	51	3.30	0.77	3.52	0.69
Total	149	3.40	0.77	3.54	0.75

ANCOVA with Covariate for Pre

$R^2 = 23.6\%$, $F(5,143) = 8.83$, $p < .001$, $\eta_{\text{partial}}^2 = .24$

Between-Subject Effects:

Class: $F(2,143) = 2.48$, $p = .088$

Pre Relevance: $F(1,143) = 30.34$, $p < .001$, $\eta_{\text{partial}}^2 = .18$

Class X Pre Relevance: $F(2,143) = 2.28$, $p = .106$

Table 8
Dependent Variable: Post Relevance

	<i>B</i>	<i>SE</i>	<i>t</i>	<i>p</i>	95% CI		η_{partial}^2
					<i>LL</i>	<i>UL</i>	
Intercept	2.38	0.42	5.72	.000	1.56	3.20	0.19
Class 1: Low vs. Class 3: Medium	0.25	0.66	0.37	.710	-1.07	1.56	0.00
Class 2: High vs. Class 3: Medium	-1.03	0.57	-1.79	.076	-2.16	0.11	0.02
Class 1: Low vs. Class 2: High	1.27	0.65	1.95	.053	-0.02	2.56	0.03
Pre Relevance	0.35	0.12	2.80	.006	0.10	0.59	0.05

Interaction Effects for Pre Relevance:							
Class 1: Low vs. Class 3: Medium	-0.07	0.20	-0.34	.734	-0.46	0.32	0.00
Class 2: High vs. Class 3: Medium	0.28	0.16	1.71	.090	-0.04	0.61	0.02
Class 1: Low vs. Class 2: High	-0.35	0.19	-1.83	.069	-0.72	0.03	0.02

Conclusions: Pre scores predicted student Post scores. There were no differences in pre or post scores across the three groups. While viewing literature as relevant to life increased with the intervention, there were not statistically significant differences across the three groups. This actually is a positive finding, suggesting both high and low achieving students held beliefs about the relevance of literature for their lives.

Self-Efficacy for Comprehending Literature

Paired-Sample t-Test

TOTAL: Pre-Post: $t(186) = 2.32$, $p = .022$

Conclusion: Students reported higher beliefs about literature self-efficacy after READI than before READI.

Table 9
Descriptives for Self-Efficacy Pre-Post by Latent Class

Class	N	Pre		Post	
		M	SD	M	SD
Class 1: Low	33	3.84	0.69	3.86	0.84
Class 2: High	65	3.91	0.75	3.93	0.78
Class 3: Medium	51	3.66	0.82	3.87	0.72
Total	149	3.81	0.77	3.89	0.77

ANCOVA with Covariate for Pre

$R^2 = 56.8\%$, $F(5,142) = 37.36$, $p < .001$, $\eta_{\text{partial}}^2 = .57$

Between-Subject Effects:

Class: $F(2,142) = 1.98$, $p = .142$

Pre Self-Efficacy: $F(1,142) = 163.14$, $p < .001$, $\eta_{\text{partial}}^2 = .54$

Class X Pre Self-Efficacy: $F(2,142) = 1.45$, $p = .238$

Table 10
Dependent Variable: Post Self-Efficacy

	B	SE	t	p	95% CI		η_{partial}^2
					LL	UL	
Intercept	1.54	0.34	4.55	.000	0.87	2.20	0.13
Class 1: Low vs. Class 3: Medium	-0.90	0.62	-1.47	.143	-2.12	0.31	0.02
Class 2: High vs. Class 3: Medium	-0.86	0.48	-1.80	.074	-1.81	0.08	0.02
Class 1: Low vs. Class 2: High	-0.04	0.62	-0.07	.945	-1.26	1.18	0.00
Pre Self-Efficacy	0.64	0.09	7.09	.000	0.46	0.82	0.26

Interaction Effects for Pre Self-Efficacy:

Class 1: Low vs. Class 3: Medium	0.20	0.16	1.26	.209	-0.11	0.52	0.01
Class 2: High vs. Class 3: Medium	0.19	0.12	1.56	.121	-0.05	0.44	0.02
Class 1: Low vs. Class 2: High	0.01	0.16	0.05	.959	-0.30	0.32	0.00

Conclusions: Pre scores predicted student Post scores. There were no differences in pre or post scores across the three groups. Again, these findings are positive in that overall students report feeling more self-efficacious for comprehending literature and these findings do not differ in statistically significant ways by latent class.

Cross-tabulated Latent Classes from Pre to Post: Examining Overall Shifts in Skill Sets

Table 11
LCA3post * LCA3 Crosstabulation

Count		LCA3 - PRE			Total
		1 LOW	2 HIGH	3 MEDIUM	
	1 LOW	7	8	9	24
LCA3 - POST	2 HIGH	11	46	24	81
	3 MEDIUM	15	15	21	51
Total		33	69	54	156

The 33 students who were in LOW class before READI ended up being in the following classes after the intervention:

- low class (7 students)
- medium class (15 students)
- high class (11 students)

Thus, for those who started in the lowest group (class 1), 78% moved up, 45% into the medium and 33% into the high classification.

The 54 students who were in MEDIUM class before READI ended up being in the following classes after the intervention:

- low class (9 students)
- medium class (21 students)
- high class (24 students)

For those who started with good reading and reasoning performance, 17% moved down but 44% moved into the group that demonstrated good performance on writing as well as reasoning.

The 69 students who were in HIGH class before READI ended up being in the following classes after the intervention:

- low class (8 students)
- medium class (15 students)
- high class (46 students)

It is interesting that although 67% maintained their classification, 11% did less well at post on both reading/reasoning and writing while 22% maintained their reading and reasoning performance but dropped in their writing performance. Of course, the READI intervention focused on reading and reasoning moreso than writing so these findings are not that surprising. As well, one could argue that the students who did well at pre really had nowhere to go but down.

These findings suggest that one area of interest for further study is to examine data that might help explain students who improved on essay assessments from those who did more poorly on the post. Factors might include grades as indicators of effort, psycho-social variables including possible shifts in such variables over time, and analyses of videos of classroom instruction to determine if there are instructional factors at play.

2014-2015:

The data addressing the following series of questions are from year 4 of the longitudinal study and include students who were juniors and seniors. Between 23 and 57 consented students took part in the instruments from which the following data are taken. Not all consented students took all measures and assessments.

Relations between perceptions of self-efficacy in comprehending literature and use of coping strategies:

Pearson correlations were generated to identify relationships between coping strategies and self-efficacy related to ability to interpret literature. Results suggest that this sense of self-efficacy around the interpretation of literature is positively correlated with taking action to solve a problem ($r(41)=.38, p<.05$). Additionally, results suggest that this sense of self-efficacy around the interpretation of literature is negatively correlated with self-blame ($r(41)=-.35, p<.05$) and PTSD-like symptoms ($r(41)=-.40, p<.01$).

Pearson correlations were generated to identify relationships between coping strategies and the metacognitive belief that there can be multiple interpretations for a piece of literature. Results suggest that this belief in multiple interpretations is positively correlated with taking action to solve a problem ($r(41)=.38, p<.05$). Additionally, results suggest that this belief in multiple interpretations is negatively correlated with substance use ($r(41)=-.40, p<.05$), behavioral disengagement ($r(41)=-.46, p<.001$) and PTSD-like symptoms ($r(41)=-.30, p<.05$).

Pearson correlations were generated to identify relationships between coping strategies and the metacognitive belief that reading a piece of literature multiple times is a waste of time. Results suggest that this belief that multiple readings is a waste of time is positively correlated with substance use ($r(41)=.33, p<.05$) and PTSD-like symptoms ($r(41)=.28, p<.05$).

Together these findings suggest possible relations between beliefs about multiple meanings in literature and one's efficacy in comprehending literature and broader indicators of psycho-social well being (e.g. positive coping strategies). While not definitive due to low N and lack of comparison group or random assignment, these findings suggest the value in further examining the social affordances of literary reasoning, particularly for populations who are wrestling with multiple societal risk factors where literary reasoning and thoughtful selection of texts might provide a buffer for engaging in risky behaviors.

Relations between perceptions of the instructional practices based on READI Framework and Cultural Modeling practices and coping

Pearson correlations indicate that the greater the frequency that students report experiencing cultural modeling activities, the more likely they are to report the following coping tendencies: taking action to directly deal with a problem ($r(46)=.32, p<.05$), seeking emotional support ($r(46) = .30, p<.05$), reframing a problem in a more positive way ($r(46)=.37, p<.05$), taking the time to plan a solution ($r(46)=.31, p<.05$), using humor ($r(46)=.44, p<.01$), accepting a problem ($r(46)=.31, p<.05$), and religious coping ($r(46)=.31, p<.05$). These correlations indicate a clear relationship between the perceived frequency of cultural modeling activities and coping tendencies. However, these relationships could be bidirectional. That is, the cultural modeling activities could promote adaptive coping strategies or adaptive coping strategies could promote greater engagement with the cultural modeling activities. Follow-up Pearson correlations were conducted to determine if Year 3 perceived frequency of cultural modeling activities predicted Year 4 coping tendencies. The results indicate that the greater the frequency that students report experiencing cultural modeling activities in Year 3, the more likely they are to report the following coping tendencies: taking action to directly deal with a problem ($r(45)=.48, p<.01$), seeking emotional support ($r(45) = .46, p<.05$), and reframing a problem more positive way ($r(45)=.40, p<.01$).

However, it is also possible that adaptive coping strategies could increase the likelihood that students could take effective advantage of the cultural modeling activities. The reader should note that, in the current sample, Year 3 scores for the same coping tendencies did not predict perceived frequency of cultural modeling activities in Year 4. Accordingly, it is more likely that the perceived frequency of the cultural modeling activities had a positive effect on coping tendencies. The cultural modeling activities were likely experienced as a support, reducing the experience of stress in the school context.

Relations between literature comprehension and writing skills (factors underlying rubric for literature EBAIM) and psycho-social variables and perceptions of school and instructional climate

In an additional analyses, we used factor analyses of rubric scores on literature EBAIMS. Factor loadings yielded two factors: Literature Comprehension and Writing Skills. We used students composite scores on these two factors to examine relationships with racial identity subscales, coping, beliefs in ability as malleable or fixed, and perceptions of instructional climate and READI specific practices. This data, consistent with earlier data in this report, were intended to examine the hypothesis of the longitudinal study that students’ self-perceptions along multiple dimensions are important resources to support motivation, persistence, effort, and learning outcomes.

Table 12. Correlations between Reading Comprehension and Writing scores with Personal and Racial Identity Subscales.

	Literature Comprehension	Writing Skills
1. Hare Self-Esteem/Block Ego Resiliency	.16	.58**

2. Crocker Collective Self-esteem		
Membership Self-esteem	.20	.34
Private Collective Self-esteem	.17	.26
3. Cross Racial Identity Scale		
Self-hatred	-.15	-.38
Miseducation	.40*	.23
Anti-white	-.10	-.45*
Afrocentric	.19	.17
Multicultural	.31	.19
4. Seller's Oppressed Minority	.23	.02
5. Stevenson's Cultural and Racial Experiences of Socialization –Youth Agreement		
Positive Affirmations	.28	.40
Coping with Race-based Issues	.30	.28
Protection	.28	.15
Racialism	-.22	-.52**
Beliefs in Negative Stereotypes	-.37	-.50*

Note: N = 25

Table 13. Correlations between Reading Comprehension and Writing scores with Coping Subscales of the Brief COPE.

	Literature Comprehension	Writing Skills
1. Active Coping	.49*	.51*
2. Seeking Help From Others Coping	.30	.59**
3. Avoidance Coping	-.06	-.28

Note: N = 25

Table 14. Correlations between Reading Comprehension and Writing scores with Dweck's Theories of Intelligence Scale.

	Literature Comprehension	Writing Skills
1. Belief in intelligence being fixed	-.07	-.35
2. Belief in Intelligence being malleable	.24	.36

Note: N = 23

Table 15. Correlations between Reading Comprehension and Writing scores with School Climate Subscales.

	Literature Comprehension	Writing Skills
1. Instructional Climate Inventory	.38	.49*
2. Project READI School Climate Scale		
High Teacher Expectations	.20	.38*
Challenging Schoolwork	.16	.24
Classes Relevant to My Life	.28	.30
Classes Support Success	.34*	.15
Classes Make Connections to My Life	.17	.10
Classes Make Me think about Social Justice	.25	.44**
Classes Take Others' Perspectives into Account	.38*	.35*
Classes Make me Think about Character Motivations	.48**	.31
Classes use Different Note-Taking Strategies	.26	.24
Classes Promote Text Analysis	.31	.32
Classes Consider Interpretations of Others	.41*	.36*
We Learn Strategies for Interpreting Literature	.29	.31
Overall Project READI Measure	.39*	.42**

Note: N = 23 for ICI. N = 38 for Project READI Scale

Overarching findings and discussion:

Overall, a positive sense of racial identity is positively associated with grades, PSAE scores, literary comprehension and writing arguments. While there is extant research documenting positive correlations with a strong sense of racial identity for general academic outcomes, to our knowledge, this is the only study to demonstrate relationships of racial identity to literacy outcomes. This also holds true for beliefs in ability as malleable and belief in one's ability to cope with challenge. Overall, students' positive perceptions of the instructional climate (a general measure of school wide climate) and their perceptions of the READI school climate (a specific measure of students' perceptions of their use of READI literacy practices drawn from the Cultural Modeling Framework) are positively correlated with literature comprehension and writing literary arguments. The READI school climate measure contained items that reflected four underlying factors: teacher expectations, challenging work, social relevance, and study strategies. Correlations of these four factors with academic outcomes like homework, literature grades, and ACT scores were mixed, differing by year. We will begin detailed qualitative analyses from ethnographic field notes, video records, and student work samples to examine sources for these mixed results. However, we anticipate that these mixed results by year will be influenced by significant differences in quality of instruction and characteristics of yearly cohorts of students. For example, we know in year 2, the sophomore class suffered by having two

different ELA teachers, both of whom were very ineffective and resistant to change. Also, predictors of ACT scores, especially for reading, were mixed across years. We hypothesize this may be due to several reasons: (1) the disconnect between the structure (timed readings and multiple choice items) of the ACT and the structure of the practices of the READI model (e.g. multiple readings of the same text, no emphasis on timed readings, open ended response rather than multiple choice); (2) a pattern of students not seeing instruction as challenging. Although we do see growth each year in ACT scores, the overall average never reached targets for state averages. However, there are also two interesting and important caveats. First, over the years of the project between 95 and 99% of seniors graduated within four years; between 95 and 100% of each senior class was accepted into four year colleges or universities; and between 65% and 75% of each cohort depending on the year persisted in college over multiple years. While our data include ACT scores from the junior year of each cohort, most students re-took the ACT in their senior year and improved scores, suggesting that additional time pays off and indicates a positive persistence on the part of students.

This intervention and the overall READI focus on disciplinary reasoning and argumentation wrestled with relations between generic comprehension skills, discipline specific comprehension and argumentation skills, and skills in written composition (See Project READI Tech Report #8.) The interplay across these skill sets we found to be particularly important in the longitudinal study with its population of largely struggling adolescent readers. Issues of text selection required explicit attention to sources of text complexity (See Appendix A: Text complexity table.). We made important findings in this process, identifying texts that were conceptually challenging while still at relatively easy readability levels. At the same time, overall there was insufficient attention to technical components of writing arguments (issues of grammar, opportunities to do multiple revisions, use of academic language in articulating claims and especially academic language appropriate to articulating warrants). We did find interesting clusters analyses of the essay exams suggesting that better readers in the discipline tended to be better writers as well.

While a very small part of the study, in one year we conducted a small number of think aloud protocols with a group of struggling readers. We allowed students to read the story twice and analyzed each reading in terms of what features of the text to which students attended and instances of metacognitive moves. Although the N is small, the results are interesting. First, students showed different patterns of attention despite different skill levels and the second reading always revealed a different focus, suggesting that opportunities to engage a second reading, in this case of a short story, widened the breadth of features of the text to which they attended.

Another interesting finding emerged from our early examinations of the qualitative data, analysis of student discourse in analyzing problems posed by the literary texts and micro-level analyses of student essays on the EBAIMS in literature. This observation includes what we are calling emergent understandings. These were instances in which students were articulating the beginnings of big disciplinary ideas (e.g. noting patterns, detecting symbolism, examining point of view), but the articulations were implicit rather than explicit, often because students were not using the language of the discipline to mark the concept or heuristic. In oral discourse, for the one class where we have begun to document this phenomenon, the teacher had difficulty

recognizing these emergent understandings or what might be considered naïve concepts (Dunbar, Fugelsang, & Stein, 2007) from the cognitive literature. In some instances, the emergent understanding introduced by the student opened up a problem or topic that was different from the focus in that moment of the teacher, but this new idea was not taken up because the teacher did not recognize in the moment the significance of the student's statement. We have documented this in AERA presentations in 2015 and 2016. We have also begun to document in the analyses of EBAIMS a similar phenomenon. In analyzing the student EBAIMS, we coded each response sentence by sentence in terms of the function of the sentence in the argument (was it a claim, evidence, reasoning or warrant; did it function to compare or contrast across stories). Instances of such emergent understandings in the EBAIMS were statements where we could infer what the student meant, but the claim was not explicit. These observations highlighted for us the importance of attention to academic language as a tool for the formal conveyance of claims, evidence and warrants in disciplinary argumentation – both orally and in writing.

Among the biggest challenges of the intervention were efforts to transform the school as an organization. While the project provided instructional coaches who worked with literature, history and seminar teachers, the uptake of these resources was mixed. In a number of cases, instructional coaches and teachers developed strong, actually long-term professional relationships that continued even after the project. In these cases, we have strong evidence of transformation of instructional practices. In other cases, teachers were very resistant to supports. In some cases we found that deep seated beliefs held by teachers superseded efforts to help them transform their practices (e.g. beliefs that students could not do the work and so the teacher would do the work of problem solving; beliefs that teaching is telling). In several cases in history, the content knowledge of several teachers was weak. We should add that overall the teachers in this school were relatively young and less experienced. From a broader administrative perspective, one problem was the shift in principals (3 different principals in four years) and insufficient follow through by principals to ensure that teachers responded to feedback from instructional coaches.

Another significant challenge was the ability of teachers to understand and respond to the social and emotional difficulties with which students wrestled. It is important to note that most students coped well. You will note from our survey in year two of students' out of school experiences that a significant number of students report experiencing traumatic events. We noted in that survey that besides their mothers, students reported significantly talking to their peers about life challenges, suggesting that in depending on their peers, they are listening to persons with as little life experience as themselves. In observing classrooms and in looking at data on issues like homework and attendance, it is clear that even a small number of students who are actively resisting instruction (either by not doing homework, not engaging in classroom work, or by actively resisting in terms of behaviors) can upset the climate of the classroom and disrupt teaching. We have concluded from these four years that teachers, especially high school content area teachers who tend to be primarily trained as content area specialists, need formal training in adolescent development and motivation to develop the pedagogical resources to understand student resistance and to be able to design in situ practices to help students through such difficulties. Certainly the presence of school counselors and social workers are important school wide resources, especially for students who are most struggling. However, classroom teachers have to be able to manage resistance in situ. They cannot simply off load responding to

resistance to others. The point here is that addressing the persistent challenge in literacy outcomes and differences in outcomes associated with race, ethnicity and class, most prominent in middle and high school, requires a multi-dimensional framework that includes attention to the cognitive dimensions of reading and argumentation in the disciplines, but equally important attention to the social and emotional demands of such complex learning challenges that takes into account the broad ecologies – risks, resources, supports – of students’ lives beyond the walls of the school; and to the demands of learning in schools as organizations and the attendant skill sets needed by both teachers and administrators. We should note that the longitudinal project took up less than 10% of the overall READI budget. Additional resources for this school wide, longitudinal project would have been helpful.

Overall, we have developed a unique longitudinal data set, sufficiently rich to support on-going future analyses. The combination of psycho-social measures, students’ perceptions of school and instructional climate, measures of literature and history epistemology, outcome data on students (attendance, grades, PSAT scores), results of tests of literary reasoning and argument, and an array of qualitative process data, especially having such data longitudinally over four years is a unique and generative resource.

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