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“Doing” the Reading: What Neuroscience Instructors Should Know about Reading Compliance and Comprehension in College

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Many neuroscience faculty assign readings from the textbook or primary literature to their students. What can we learn from research about how many of the students actually “do” the reading and, of those who do it, comprehend what they read? This article presents findings from studies on college student compliance with and comprehension of assigned readings and offers research-

based strategies for motivating students to complete the readings in ways that promote deep learning. Faculty are encouraged not only to ask about the role that reading plays in undergraduate learning, but also the role that they themselves play in developing college student reading proficiencies.

Key words: reading compliance, comprehension

Like their colleagues in other disciplines, many faculty in neuroscience assign reading outside of class on the well-grounded assumption that reading promotes a deeper understanding of complex concepts within the field as well as general critical thinking skills. However, recent research on the extent to which students (a) complete reading assignments and (b) comprehend what they do read strongly suggests that unless students are held accountable for “doing the reading” and, in many cases, given scaffolds of support for understanding it, the assignments do little to promote the kind of learning their instructors wish to see.

Based on a workshop on “Getting Students to Do the Reading” at the July 2017 FUN Pedagogy Workshop at Dominican University, this short paper offers a brief summary of research conducted across the disciplines on reading compliance and comprehension in college. What do we know, what works, and what questions might undergraduate neuroscience teachers ask about the relationship between reading and neuroscience education?

Though we often talk about reading assignments in binary ways, e.g., the students either “did” or “did not” do them, the problem of “not doing” the reading has multiple, distinct roots. “Not doing” the reading, for example, might include never buying the textbook, as was the case for 23% of the business students in one recent study of reading compliance (Braguglia, 2006). Further, those who have the book may never begin the reading, not finish it, skim it, highlight everything within it, filter what they read through their own beliefs, misread or misunderstand key concepts, or understand and then forget major ideas. Though each of these varieties of not doing the reading stems from a different issue, it may present as the same symptom in the classroom - a blank stare in response to questions about the assigned text.

To what extent do students even attempt the reading? Several studies from across college disciplines indicate that one should expect that less than one-third of one’s students have completed the assigned reading before

coming to class (Burchfield and Sappington, 2000; Sappington et al., 2002; Clump et al., 2004; Connor-Greene, 2016). Though I am not aware of studies on compliance with reading assignments in neuroscience specifically, a study conducted in a family discipline (physics) found that while 97% of students in the sample purchased their assigned physics textbook, only 41% of them reported that they regularly read the book before lectures (Podolefsky and Finkelstein, 2006). However, this same study found that a larger number of students (60%) claimed to have read the textbook before an exam, a finding that is consistent with results of a similar study in psychology (Clump et al., 2004). The appreciable difference between the numbers of students who read before class and who read before exams suggests that one place for faculty to begin motivating their students to do the reading is to clarify with students what the reading is *for*.

Taken together, these findings suggest that students are more likely to do the reading when they see a clear link to success in the class; more often than not, some studies suggest, they do not see that connection (Sappington, 2002; Braguglia, 2006). One study of business students found that while only 4.3% of surveyed professors believed that a student could make an A or B in the class without doing the reading, a full 34% of students said they could do so (Braguglia, 2006). The same study found that 95% of professors said that reading the textbook was important but only half of the students agreed.

While these findings on compliance with reading assignments might be disappointing to those of us who study reading comprehension, perhaps this data suggests a call to faculty of all disciplines to continue to include these important reading assignments in the curriculum.

In fact, neuroscience faculty might assign reading not just because it can promote learning in their own courses, but because in doing so they are working with their colleagues towards the shared goal of developing reading proficiency of college graduates.

A 2003 assessment of adult literacy found that just 31%

of college graduates were proficient readers, meaning that they were able to read lengthy, complex texts, synthesize information and draw complex inferences (Kutner, 2003). This number declined from 40% in 1992. A separate and more recent study that focused on the reading comprehension skills of first semester freshmen found that of the 46% of the students who said that they completed the reading, only 55% of those were able to demonstrate basic comprehension of the text (Hoefl, 2012).

Research on comprehension indicates that what matters most for understanding a passage is (a) having a goal for the reading, (b) having background knowledge on the topic, and (c) having developed a self-concept as a reader (Willingham, 2017). Being clear about the purpose of a reading assignment and tightly aligning readings with class activities so that one *builds off the other in explicit ways* will help students develop the goals and background knowledge that are useful for developing reading proficiency. And the best way for students to develop self-concepts as readers is, in fact, for them to read *more* (Willingham, 2017). In other words, one of the reasons that students may not complete course readings is because they do not see “being a reader” as a salient aspect of their personal identities. Helping students develop habits of reading through increased practice in and accountability for reading in a single class may help them see themselves as “people who read” in general, increasing the likelihood that they will read for other courses as well.

College teachers can help their students develop goals for reading assignments by clarifying the purpose of an assignment, its intended outcomes, and describing (or, even better, asking students to describe) the way it connects to larger course goals or concepts from the lecture. If this process of reflection reveals that textbook readings largely duplicate the material covered by the lecture or course activities, it may be especially important to be clear about the purpose of the reading and/or to reevaluate the value of the assignment at all. Is the assignment a passive resource for exam review? A suggested (but not required) “pre-read” for the lecture? If it seems as if the reading largely duplicates the lecture, students are likely to be better served by one of two options. The first option would be to hold them accountable for reading the textbook by assessing their comprehension of it and then using class time to deepen their understanding by applying concepts from the reading to new contexts or cases. The second would be to keep the class activities as they are (e.g., lecture) but to ask students to read (and, again, be held accountable for) primary literature that extends or challenges their grasp of the foundational concepts established in class.

Research on learning in college identifies some strategies as more effective than others in getting students to engage the readings. For example, while many college teachers believe that a participation grade will encourage students to complete the reading, empirical studies suggest that most students are quite happy to participate in a discussion without having done the reading. In one study that surveyed students in 16 classes, only 20% of the

students identified “not having done the reading” as a reason to not participate in discussions (Howard and Henney, 1998).

Participation grades may not work, but quizzes do. Several studies suggest that reading quizzes not only encourage reading compliance but also strengthen learning of the course material (Ruscio, 2001; Heiner et al., 2014; Connor-Greene, 2016). A recent study by Hodges et al. (2015) confirms the effectiveness of quizzes for developing student compliance with and comprehension of reading assignments in STEM classes and also offers concrete ideas for incorporating them in ways that promote deep learning. For example, the authors suggest that quiz questions aimed at lower-order thinking (e.g., defining a term or solving a problem similar to an example in the text) can be followed up by class activities that ask students to explain their reasoning or defend their answers.

Other strategies for promoting reading in STEM classes include structured exercises for helping students to read primary literature and make the best use of their textbook. Wenk and Tronsky (2011) have developed a reading guide to help first-year science students prepare to read primary research as well as a list of assignments aimed at helping students connect the primary research to textbook or lecture information. Their examples include “pre-reading” assignments in which students are asked to write about one graph or table in an article before reading the entire thing or “post-reading” assignments that ask students to update the textbook based on the research findings. Another approach, developed by Brownell et al. (2013), asks students to translate primary scientific research articles into one-page summaries intended for general readers, as one might find in the *New York Times* Science Tuesday section. An additional strategy for incorporating reading involves asking students to first identify “key sentences” in a passage and then evaluate its placement, clarity, and integration within a paragraph (Bennett and Taubman, 2013). Harmon and Pegg (2012) have suggested ways to embed laboratory experiences with activities that strengthen reading by, for example, asking students to make concept maps, break down vocabulary words, and write focused questions based on textbook chapter headings.

When facing the evidence that students did not “do” the assigned reading, it is tempting to either abandon reading assignments altogether or to keep the assignments but teach in a way that does not depend on their completion, e.g., by duplicating the content in the assigned reading in a lecture. Doing so minimizes the role that reading plays in undergraduate neuroscience education, but it also minimizes the responsibility of neuroscience faculty in developing college graduates who are proficient readers.

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