



## Children's behavioral regulation and literacy: The impact of the first grade classroom environment



Stephanie L. Day<sup>a,\*</sup>, Carol McDonald Connor<sup>a</sup>, Megan M. McClelland<sup>b</sup>

<sup>a</sup> Arizona State University, USA

<sup>b</sup> Oregon State University, USA

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### ABSTRACT

Classroom learning environments are an important source of influence on children's development, particularly with regard to literacy achievement and behavioral regulation, both of which require the coordination of task inhibition, attention, and working memory. Classroom observations were conducted in 18 schools and 51 first grade classrooms for 500 children. The non-instructional activities were recorded for each student in the classroom. Hierarchical linear modeling revealed that children with weaker fall behavioral regulation were more likely to attend classrooms where more time was spent in disruptions and wasted instructional time over the course of the school year, such as waiting for the teacher to gather materials before beginning instruction. For literacy outcomes, children who were in classrooms where more time in disruptions, transitions, and waiting was observed showed weaker literacy skill gains in the spring compared to children in classrooms with lesser amounts of such unproductive non-instructional time and this effect was generally greater for students with initial weaker skills. These results also reveal that the classroom environment and the incoming characteristics of the students themselves influence students' development of behavioral regulation and literacy.

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According to a recent report by the National Assessment of Education Progress (NAEP), only 34% of children read at or above a proficient literacy level in 4th grade and this number is even lower for children living in poverty (NAEP, 2014). Proficient literacy skills provide the foundation for academic success (NRP, 2000). Therefore, understanding the malleable sources of influence that are associated with stronger literacy skills can inform the development of effective learning opportunities for students, particularly those at risk for academic underachievement. One particularly significant source of influence is the classroom learning environment (Carlisle, Kelcey, Berebitsky, & Phelps, 2011; Pianta, Belsky, Houts, Morrison, & NICHD-ECCRN, 2007). In addition to the classroom environment, there are also a number of child characteristics that can impact literacy achievement and academic success (Duncan et al., 2007; McGee, Prior, Williams, Smart, & Sanson, 2002), such as incoming experience with literacy, language, and behavioral regulation skills, with behavior regulation including executive function processes of attentional or cognitive flexibility, working memory, and inhibitory control. Using bio-ecological (Bronfenbrenner & Morris, 2006) and transactional (Morrison & Connor, 2009) frameworks, where the classroom learning environment influences but is also influenced by the characteristics of the students, the purpose of this study was to investigate the interacting relations among first graders' behavioral regulation skills, their academic achievement, and the classroom learning environment focusing specifically on non-instructional activities that take time away from meaningful instruction.

\* Corresponding author at: Institute for the Science of Teaching & Learning Arizona State University, P.O. Box 872111, Tempe, Arizona 85287-2111.  
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## 1. Defining behavioral regulation

Previous research has defined behavioral regulation as the integration of cognitive processes, called executive function, that include attentional or cognitive flexibility, working memory, and inhibitory control (Cameron Ponitz et al., 2008; McClelland et al., 2007). Executive function skills are thought to consist of cognitive processes that underlie self-regulated action (Best & Miller, 2010; McClelland & Cameron, 2012; McClelland et al., *in press*). Recent research has focused on how underlying executive function skills are translated into behavior in young children. This is especially relevant for research on children's early learning in classroom settings. For example, attentional or cognitive flexibility allows children to focus on a task or switch tasks when needed. Working memory involves keeping information in mind while processing new stimuli (e.g., remembering a set of instructions and then carrying out those instructions as accurately as possible). Inhibitory control can be described as the ability to stop incorrect responses and carry out more adaptive solutions, such as waiting to be called on rather than blurting out an answer (Cameron Ponitz, McClelland, Matthews, & Morrison, 2009). For this study, we use the term behavioral regulation because our aim is to examine how children's executive function skills translate into behavior in classroom settings and how they are related to early reading achievement in first grade (Cameron & Connor, 2004; McClelland et al., 2007).

Strong behavioral regulation skills appear to be key for children to control their thoughts and behaviors so that they can benefit from new learning experiences (Blair, 2002). Research has shown that students who demonstrate more disruptive behaviors and who lack self-control in elementary school are more likely to exhibit later academic difficulties (Vitaro, Brendgen, Larose, & Tremblay, 2005). Some studies have also indicated that children who have poor behavioral regulation can disrupt the overall flow of the classroom and make it more difficult for the teacher to deliver effective instruction (Skibbe, Phillips, Day, Brophy-Herb, & Connor, 2012; Vitaro et al., 2005). Thus, it is possible that children's strong behavioral regulation is related to better classroom environments, but also that the quality of instructional time in classrooms may be related to stronger behavioral regulation in children.

## 2. The classroom learning environment

Accumulating research reveals that understanding the complex world of the classroom is better explicated using perspectives that include bio-ecological (Bronfenbrenner & Morris, 2006) and transactional theories (Morrison & Connor, 2009; Sameroff & MacKenzie, 2003) of development (Connor et al., 2009b; Justice, Petscher, Schatschneider, & Mashburn, 2011; Rimm-Kaufman, La Paro, Downer, & Pianta, 2005). These perspectives point to the complex and interactive nature of classroom settings where children bring their own personalities and skills and are also influenced by the classroom environment, including the teacher and their classmates. Thus, a child's development is influenced by the complex and potentially reciprocal relations among these multiple factors over the course of time rather than by specific characteristics or the classroom environment operating to influence children's development and learning. The classroom environment influences children's development and, in turn, children in the classroom influence the environment and their classmates' development (Skibbe et al., 2012). Thus, it is important to consider how the classroom environment, teachers, and classmates might impact children's behavioral regulation and academic skills may provide understanding of malleable mechanisms that influence both the environment and children's learning. For example, one disruptive student may influence the actions of the teacher as well as other children in the classroom, which may in turn, influence an individual child's behavior or performance in the classroom. This influence may also differ among students. At the same time, a chaotic classroom environment, characterized by high levels of noise, too many changes, or by low levels of structure and routine, generally offers poor learning environments (Maxwell, 2010). Classrooms that lack structure and organization may be problematic for all students, but this may be especially true for children with poor behavioral regulation skills who struggle to control their behavior and may not receive sufficient scaffolding from teachers to strengthen these skills (Connor et al., 2010). Whereas disorganized classrooms may interfere with learning behavioral regulation skills (Maxwell, 2010), a classroom environment that is well-planned and organized and expects that students are self-regulated is generally associated with stronger student achievement (Connor et al., 2010). At the same time, such a classroom might be more difficult to accomplish if the proportion of children with weak behavioral regulation is high (Skibbe et al., 2012). Although teacher organization and disruptions are not the only important factors to consider for producing a productive and efficient classroom learning environment, these factors can be problematic for academic success and are important to consider.

## 3. Non-instruction

In this study, non-instruction refers to activities in the classroom that do not explicitly focus on instruction that is intended to teach children skills and information (e.g., literacy instruction). Non-instruction includes the classtime that students spend going off-task, causing disruptions, switching activities, cleaning up, and waiting for the teacher. Non-instruction also includes time spent where the teacher is disciplining students or when the teacher is giving directions for an upcoming activity that does not contain any actual reading instruction, or is expressing expectations for general classroom behavior. For example, before the students return to their desks, the teachers might tell them they are going to complete a set of worksheets, where they will find the materials they will need, and so on. The key is that she is not actually teaching the children how to, for example, write. More examples of non-instruction are provided below.

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