Measuring preschool learning engagement in the laboratory

Simone E. Halliday a,⇑, Susan D. Calkins b, Esther M. Leerkes b

a Department of Psychology, The University of North Carolina at Greensboro, Greensboro, NC 27412, USA
b Department of Human Development and Family Studies, The University of North Carolina at Greensboro, Greensboro, NC 27412, USA

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Abstract
Learning engagement is a critical factor for academic achievement and successful school transitioning. However, current methods of assessing learning engagement in young children are limited to teacher report or classroom observation, which may limit the types of research questions one could assess about this construct. The current study investigated the validity of a novel assessment designed to measure behavioral learning engagement among young children in a standardized laboratory setting and examined how learning engagement in the laboratory relates to future classroom adjustment. Preschool-aged children (N = 278) participated in a learning-based Tangrams task and Story sequencing task and were observed based on seven behavioral indicators of engagement. Confirmatory factor analysis supported the construct validity for a behavioral engagement factor composed of six of the original behavioral indicators: attention to instructions, on-task behavior, enthusiasm/energy, persistence, monitoring progress/strategy use, and negative affect. Concurrent validity for this behavioral engagement factor was established through its associations with parent-reported mastery motivation and pre-academic skills in math and literacy measured in the laboratory, and predictive validity was demonstrated through its associations with teacher-reported classroom learning behaviors and performance in math and reading in kindergarten. These associations were found when behavioral engagement was observed during both the nonverbal task and the verbal story sequencing tasks and persisted even after controlling for child minority status, gender, and maternal education. Learning engagement in preschool appears...
to be successfully measurable in a laboratory setting. This finding has implications for future research on the mechanisms that support successful academic development.

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Introduction

Children's learning behaviors play an important role in promoting successful academic and school outcomes (Appleton, Christenson, & Furlong, 2008; Kagan, Moore, & Bredekamp, 1995). Learning engagement during early childhood may be particularly critical because early engagement may predict both future levels of engagement (Ladd & Dinella, 2009) and trajectories of academic growth through elementary school (Bulotsky-Shearer & Fantuzzo, 2011; Li-Grining, Votruba-Drzal, Maldonado-Carreño, & Haas, 2010; McClelland, Morrison, & Holmes, 2000). Understanding the development of learning engagement and the mechanisms that support it may in turn provide important information about processes of school adjustment. To assess these mechanisms, it is necessary to have instruments that can validly measure learning engagement prior to school entry in diverse contexts and through diverse means. However, current methods of measuring learning engagement during early childhood are primarily restricted to teacher report or classroom observation, each of which may be influenced by the reporter or the context and may be restrictive for investigators conducting research within a laboratory setting. A laboratory measure of learning engagement, therefore, may help to broaden our understanding of the individual psychological processes and mechanisms supporting this construct. The goal of this study was to examine the validity of a novel measure designed to assess behavioral learning engagement in young children and investigate whether laboratory-measured learning engagement in preschool is associated with classroom measures of school adjustment in kindergarten.

Engagement during learning, variously labeled by terms such as school engagement, approaches to learning, and learning engagement, can be conceived of as a multidimensional construct that operates at the affective, cognitive, and behavioral levels, although most work has focused on the behavioral aspects (Fredricks, Blumenfeld, & Paris, 2004). Affective engagement describes how much a child likes school and is interested in learning, whereas cognitive engagement describes a child's effort and investment as well as deep strategic thinking. These levels of engagement tend to be internal processes that are difficult to observe.

In contrast, behavioral engagement broadly refers to observable actions, particularly those that denote active participation and focused involvement. During early childhood, these behaviors may be characterized by focused on-task behavior, attention during instructions, rule adherence, and the contribution of questions or observations at appropriate times. As children advance through school, initiating active involvement, participating in extracurricular learning activities, and remitting work punctually may also become important indicators of behavioral engagement (Mahatmya, Lohman, Matjasko, & Farb, 2012). Although these three dimensions of learning engagement may be distinct theoretically, they are often difficult to tease apart empirically because behavioral engagement can also encompass the behavioral manifestations of engagement at the affective and cognitive levels in the form of expressed enjoyment, enthusiasm, and strategic behavior. Behavioral engagement, therefore, is the broadest and most readily measured aspect of engagement and may be particularly useful when studying the development of learning processes in children.

Learning engagement is often compared to motivation. These two processes are related but distinct constructs, with motivation conceived of as more abstract and engagement as more concrete (Appleton et al., 2008; Finn & Zimmer, 2012; Newmann, Wehlage, & Lamborn, 1992). In other words, whereas motivation refers to internal drives, engagement is the behavioral, cognitive, and affective result of these drives (Reeve, 2012). As Appleton et al. (2008) concluded, motivation is necessary but not sufficient for engagement to occur. As such, one would expect children’s mastery motivation,
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