



## The role of personal best (PB) goals in the achievement and behavioral engagement of students with ADHD and students without ADHD

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### ABSTRACT

In the context of competitive classroom settings and relativistic assessment schedules, some groups of students may particularly benefit from an emphasis on personal progress and personal growth approaches to their academic development. Building on recent promising results from general samples of high school students (undifferentiated by academically at-risk sub-groups within them) and dominant models of attention and executive functioning, the present study examines the potential of personal best (PB) goals for students with attention-deficit/hyperactivity disorder (ADHD). The study focuses on  $N = 87$  students with ADHD and  $N = 3374$  non-ADHD peers from the same schools and year levels – in addition to a supplementary analysis of a randomly drawn non-ADHD sub-sample of  $N = 87$  and a second supplementary analysis controlling for achievement. Multi-group multivariate path analyses demonstrated (a) significant and positive associations between PB goals and academic outcomes (achievement and behavioral engagement) for students with ADHD, (b) similar positive effects for non-ADHD students ( $N = 3374$ ), (d) replicated results with the randomly drawn non-ADHD sub-sample ( $N = 87$ ), (e) similar findings when controlling for achievement, and (f) absolute parameter estimates that trended larger for students with ADHD than non-ADHD students. These findings indicate that the positive role of PB goals may generalize across diverse student groups and that there appears to be merit in broadly promoting PB goals amongst ADHD (and, potentially, other academically at-risk students) and non-ADHD students alike.

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### 1. Introduction

Goals play a significant role in students' academic development (Anderman & Wolters, 2006; Elliot, 2005; Linnenbrink-Garcia, Tyson, & Patall, 2008; Maehr & Zusho, 2009). Different types of goal constructs have been proposed and operationalized in psycho-educational research, including goal setting, goal orientations, and goal structures (Anderman & Wolters, 2006; Maehr & Zusho, 2009). The present study focuses on the former of these goal domains. One of the most recently proposed goal constructs within this domain is that representing 'personal best' (PB) goals in schoolwork. PB goals are defined as specific, challenging, competitively self-referenced targets towards which students strive. Academic examples include doing better on current schoolwork than on previous schoolwork or expending greater effort on a current assignment than on a previous assignment (Martin, 2006, 2011; Martin & Liem, 2010). The focus on PB goals emerges from the increasing interest in growth approaches to student development, including value-added

models and modeling of academic trajectories (see Anderman, Anderman, Yough, & Gimbert, 2010; Betebenner, 2008, 2009; Briggs & Betebenner, 2009; Harris, 2011). It also aligns with broader developments in work around 'growth mindsets' that are aimed at promoting personal potential in key domains of human functioning (Dweck, 2006).

To date, PB goals have been shown to benefit academic outcomes in studies of general samples (i.e., undifferentiated by academically at-risk sub-groups within them) of high school students (e.g., Martin, 2006; Martin & Liem, 2010). However, if PB goals are to be implemented in 'regular' (or 'general') classrooms, it is important to demonstrate the generalizability of positive effects across a diversity of students in those environments. As one effort towards this, the present study explores the role of PB goals amongst an academically at-risk sub-group of students (with attention-deficit/hyperactivity disorder: ADHD<sup>1</sup>) and their non-ADHD peers residing in the same schools. It does so with a focus on academic achievement (national standardized literacy and

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<sup>1</sup> The terms 'students with ADHD' and 'ADHD students' are sometimes used interchangeably. Importantly, the use of the latter term is not meant to indicate students are defined by their ADHD condition.

numeracy performance), adaptive behavioral engagement (home-work completion, planning, task management, persistence), and maladaptive behavioral engagement (self-handicapping, disengagement) as dependent measures. Thus, while shedding new light on a group of students not previously studied in PB goals research (students with ADHD), the investigation also offers an opportunity to further validate the role of PB goals in 'regular' (or 'general') classrooms. It locates this study of goals within a broader self-regulatory framework explaining the role of goal-directed behavior in the functioning of students with ADHD (Barkley, 2006); the literature that attends to goals, their forms and their impacts (e.g., Locke & Latham, 2002); and, specific multidimensional measurement of engagement factors that draw on recent conceptualizing in the engagement literature (e.g., Fredricks, Blumenfeld, & Paris, 2004; Martin, 2007, 2009).

This study adapts the American Psychological Association's (2007) definition of at-risk ("vulnerable to disorder or disease"; p. 81) to consider academically at-risk students as those who are vulnerable to maladaptive academic pathways and outcomes. When considered from this perspective, students with ADHD can be considered part of a large body of students at academic risk. The study, then, has potential relevance to educators and researchers of academically at-risk and non-at-risk students alike. Indeed, because most students with ADHD reside in 'regular' (or 'general') classrooms and schools (Barkley, 2006), exploring positive practices and approaches that might generalize across them and their non-ADHD peers is important.

The focus of most studies of ADHD and educational outcomes has been on mean levels of these outcomes as a function of ADHD status—for example, whether there are differences in mean levels of achievement for students with or without ADHD. Less attention, however, has been given to differences in relationships between educational factors and whether the same relationships between educational factors exist with equal validity for students with ADHD and those without ADHD. At a pragmatic level, the implications of this issue are substantial. For example, although PB goals seem to yield positive effects on academic outcomes in general studies that do not differentiate academically at-risk sub-groups (Martin & Liem, 2010), unless there is reasonable support for the invariance of the adaptive relationship between PB goals and outcomes as a function of ADHD status, it may not be justified to more broadly adopt PB goals in inclusive educational contexts comprising students who are and are not at academic risk. Such concerns are most appropriately evaluated by exploring comparative correlation and regression parameters (see Marsh, 1993) to determine whether—and how—the role of PB goals varies according to ADHD status. Hence, not only does the present study explore the role of PB goals in the academic life of students with ADHD, it also assesses how this role compares in a sample of students without ADHD.

## 2. Self-regulatory model of ADHD

Much research into ADHD tends to be atheoretical, more focused on applied considerations than theoretical ones (Barkley, 2006). One of the more dominant models is that emphasizing the self-regulatory aspects of ADHD. This theorizing identifies a leading role for the importance of behavioral inhibition that delays (or inhibits) initial prepotent responses to an event, stops ongoing responses, and controls potential interferences and distractions (Barkley, 2006). The operation of these inhibitions is crucial for the individual to have the time to then enact appropriate self-directed actions that constitute self-control and self-regulation (Barkley, 2006). These self-directed actions are, according to Barkley, the executive functions required to successfully engage in tasks and activities, including schoolwork. Four executive functions are identified (non-working memory, verbal working memory, self-regulation of

motivation, and reconstitution), two of which – self-regulation of motivation and reconstitution – directly involve goals and goal-directed behavior (Barkley, 2006). Importantly also, the joint operation of all four executive functions leads to control that encompasses goal-directed persistence (Barkley, 2006). Because behavioral inhibition is a major area of vulnerability for students with ADHD, their executive functions tend to be impaired, as are component functions related to goal-directed behavior and goal-directed persistence. These executive functions tend to operate alongside each other as unique factors that are (inevitably) correlated but intended to explain distinct variance in outcomes. Goals reside within these executive functions and PB goals are a specific form of goals that may have distinct pertinence to students with ADHD.

Intervention relevant to the self-regulatory processes has been identified. These include pharmacological intervention to address behavioral inhibition, activities to train working memory, and even classroom approaches to reduce distractions (Barkley, 2006; Martin, in press-a). The present study is directed to goals and goal setting, a feature evident in major parts of Barkley's self-regulatory model. Indeed, given the function of goals in Barkley's ADHD model, it might be hypothesized that students with ADHD who engage in goal-directed behavior and commitment will evidence positive academic outcomes. As explained in detail below, in the context of the present study, students with ADHD pursuing PB goals might be expected to reflect higher achievement and behavioral engagement. A question following this is how this hypothesized impact of PB goals compares with that of non-ADHD students. This study draws on an important component of Barkley's model and specifically operationalizes it through the application of recent theory and research on goals and goal-directed behavior (Locke & Latham, 2002).

Interestingly, however, it seems research in educational psychology channels has been relatively silent on the issue of ADHD. Instead, school psychology outlets tend to be a dominant cognate channel through which such research is conducted and published. For example, searching PsycINFO for empirical studies, a total of 100 articles have been published under one or both of the keywords 'ADHD' or 'attention deficit with hyperactivity disorder' between the years 1990 and 2010 in three major school psychology journals (*Journal of School Psychology*, *Psychology in the Schools*, *School Psychology Quarterly*). In contrast, a total of 7 articles using the same search parameters have been published in three major educational psychology journals (*Journal of Educational Psychology*, *Contemporary Educational Psychology*, *British Journal of Educational Psychology*). Educational psychology outlets have a particular focus on factors and processes relevant to learning and achievement, including motivation and behavioral engagement. In particular, educational psychology outlets have been a dominant presence in the area of goals and goal-directed behavior in learning and achievement. Thus, educational psychology research investigating these factors and processes among students with ADHD enables substantive and applied contributions from this psychological perspective that, in conjunction with school psychology (and clinical and other psychological perspectives), lays a broad base for effective educational intervention.

## 3. Goals and goal setting

This study attends to aspects of Barkley's model that relate to goal-directed behavior and goal-directed persistence. It seeks to connect an important aspect of the overarching ADHD framework described by Barkley (i.e., goals and goal-directed behavior); the literature that attends to goals, their forms and their impacts; and, specific multidimensional measurement of engagement factors that draw on recent conceptualizing in the engagement literature. The study can, therefore, be seen in terms of progressive levels of abstraction. It begins with identification of the importance

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