



Contents lists available at ScienceDirect

Journal of School Psychology

journal homepage: www.elsevier.com/locate/jschpsyc

Advancing the science and practice of precision education to enhance student outcomes

Clayton R. Cook^{a,*}, Stephen P. Kilgus^b, Matthew K. Burns^b

^a University of Minnesota, United States

^b University of Missouri, United States

A B S T R A C T

School psychology research and practice has considerable room for growth to go beyond “did an intervention work?” to “what intervention worked for whom and how did it work?” The latter question reflects a more precise understanding of intervention, and involves strategic efforts to enhance the precision of services students with academic, behavioral, emotional, or physical health problems receive to enhance the degree to which interventions are appropriately tailored to and produce benefit for individual students. The purpose of this special issue is to advance the notion and science of precision education, which is defined as an approach to research and practice that is concerned with tailoring preventive and intervention practices to individuals based on the best available evidence. This introductory article provides context for the special issue by discussing reasons why precision education is needed, providing definitions/descriptions of precision education research, and outlining opportunities to advance the science of precision education. Six empirical studies and one methodological-oriented article were compiled to provide examples of the breadth of research that falls under precision education. Although each of the article focuses on students with different needs (literacy deficits, math deficits, emotional and behavior problems, and intellectual disability), there is a common thread that binds them together, and that is each one captures the heterogeneity among students with particular problems or deficits and highlights the need to select and deliver more precise interventions to optimize student outcomes.

1. Introduction to the special issue

Intervention science and data-based decision making are hallmarks of school psychology (Ysseldyke et al., 2008), but school psychology research is less mature than other branches of psychology, despite increasingly rigorous methods (Power & Mautone, 2011), because it has yet to evolve beyond “did it work?” to “what intervention worked for whom and how did it work?” (Burns and Petersen-Brown, in press). There is an extensive literature regarding effective interventions, including those related to academics, behavior, emotion, and physical health (Gersten et al., 2009; Hattie, 2009; Neil & Christensen, 2009; Reddy, Newman, De Thomas, & Chun, 2009; Scammacca, Roberts, Vaughn, & Stuebing, 2015); yet, the implementation of interventions in applied settings continues to yield disappointing results (Balu et al., 2015; Cordray, Pion, Brandt, Molefe, & Toby, 2012).

One potential reason for such disappointing intervention outcomes pertains to the manner in which interventions are applied in school settings. Many schools apply a “standard protocol” approach to intervention, which involves providing the same intervention to all students in a similar fashion (Fuchs & Fuchs, 2006; Sanetti & Simonsen, 2011). Unfortunately, previous research has found that

* Corresponding author.

E-mail address: crcook@umn.edu (C.R. Cook).

<https://doi.org/10.1016/j.jsp.2017.11.004>

this standard protocol approach often falls short of achieving desired outcomes, resulting in programs, practices, and interventions with modest or negligible effects (e.g., [Benner, Nelson, Sanders, & Ralston, 2012](#)). When schools do forego this standard approach and adopt multiple interventions, they often select strategies in an arbitrary or trial-and-error fashion ([DuPaul & Weyandt, 2006](#); [Hafford et al., 2013](#)), which is equivalent to “shooting in the dark and hitting targets indiscriminately” ([Shoham & Insel, 2011, p. 480](#)). Furthermore, there is lack of integrated approaches to intervention that involve assessing student needs across multiple fronts (academics, behavior, emotion, and physical) to better inform intervention programming ([Cook et al., 2012, 2015](#)).

Using a standard intervention protocol approach or trial-and-error approach is unfortunate, as students with or at-risk for academic, behavior, emotion, and physical health problems are a heterogeneous group with considerable individual differences that should be considered when designing and delivering interventions. Accordingly, researchers need to develop and test ways to select more precise interventions for individual students to enhance outcomes and avoid educational waste (i.e., use of time, money, and resources that results or produces no change in outcomes), potential iatrogenic effects, and counterproductive effects ([Kazdin & Blasé, 2011](#)).

2. Science of precision care

In recognition of the shortcomings to current intervention approaches, there has been a surge of interest among researchers from various disciplines to advance precision care to enhance the degree to which supports are appropriately tailored to the individual. Although researchers have been interested in examining aspects of the “what intervention worked for whom and how did it work” question for decades, only recently have this work begun to take shape and represent a distinct area of science focused on identifying variables, theoretical paradigms, and methods to facilitate tailoring interventions for individuals. Mounting evidence across medicine, psychology, and education suggests that a more precise approach in which interventions are tailored to individual characteristics (e.g., needs, preferences, or culture) is likely to result in superior outcomes relative to a standardized one-size-fits-all or trial-and-error approach. Below we provide the definition of precision research, contextualize it within previous research on tailoring interventions, discuss structural components of precision, and present relevant research methods.

2.1. Definition

The terms precision, personalize, matching or tailoring are often used interchangeably by researchers to better understand the heterogeneity among individuals with particular problems in order to more precisely prescribe intervention. These terms all convey a similar idea: to engage in efforts to get the right intervention in place for the right person for the right reason. In other words, precision researchers do not ask if an intervention is effective (i.e., did it work?), they ask: What intervention worked for whom and how did it work? The “what intervention” component of this question can be more carefully approached with precision in mind by capitalizing on recent advancements in research design to examine intervention sequencing and dosage and matching based on pre-intervention data. The “with whom” component of this question involves an explicit focus on identifying tailoring variables (e.g., needs, preferences, motivation to change) through carefully conducted moderator analyses examining students’ response to intervention. The “how it worked” component of this question reflects determining why interventions result in positive outcomes via mediator analyses that seek to identify the precise mechanisms by which interventions work for particular sub-groups of students.

The President’s Council of Advisors on Science and Technology (2008) identified precision medicine as a top priority of healthcare research and defined it as “the tailoring of medical treatment to the individual characteristics of each patient.” A few years after the National Research Council issued this definition, President Obama launched a multi-million dollar Precision Medicine Initiative ([The White House, 2015](#)), which coincided with similar efforts in the United Kingdom to initiate the Precision Medicine Catapult designed to advance precision medicine ([Precision Medicine Catapult, 2015](#)). Advancements in educational and psychological research have paved the way for a new era of service delivery in schools to improve the precision of practices aimed at preventing and ameliorating social, emotional, academic, and physical health problems.

[Bickman, Lyon, and Wolpert \(2016\)](#) provided a useful definition of precision care with applications to school-based research and practice when they defined precision mental health as

“an approach to prevention and intervention that focuses on obtaining an accurate understanding of the needs, preferences, and prognostic possibilities for any given individual, based on close attention to initial assessment, ongoing monitoring, and individualized feedback information, and which tailors interventions and support accordingly in line with the most up-to-date scientific evidence.” (p. 272)

Precision education is an approach to research and practice that is concerned with tailoring prevention and intervention practices to individuals based on the best available evidence. It represents an emerging approach that is fundamentally concerned with the “what intervention worked with whom and how did it work” question and capitalizes on extant research elucidating hypothesized root causes of particular problems (e.g., social, emotional, academic, or physical health), and linking these hypothesized causal factors to prevention and intervention at the level of the individual student. It also builds on innovations in research design that enable researchers to ask and answer precision education-focused research questions.

2.2. Previous relevant research

Precedent for the precision education approach is founded upon decades of research in a variety of areas. Within the academic

Download English Version:

<https://daneshyari.com/en/article/6843769>

Download Persian Version:

<https://daneshyari.com/article/6843769>

[Daneshyari.com](https://daneshyari.com)