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How Is Social Validity Measured in Math Interventions?

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Abstract

Learning disabilities are the most common type of disability in children. Oftentimes this translates to struggling with how to learn specific skills, like mathematics. While there is extensive research on what kinds of interventions may work for these students, little is known about the social validity (e.g., the perception of the intervention's helpfulness) of these interventions. Many studies have shown that intervention efficacy can be increased when the participants believe that the intervention is helpful and easy to use. To help fill this gap, the authors of this article conducted a synthesis of 22 studies to associate types of interventions for students with learning disabilities as well as the social validity of these interventions. Researchers coded for multiple variables, focusing on the presence of learning disability, social validity assessments for both teacher and student, and treatment fidelity. The results of this synthesis provide future researchers and teachers with important information about the types of mathematics interventions that students and teachers find to be the easiest to use and how social validity is currently being measured in intervention studies.

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INTRODUCTION

Researchers often collect evidence regarding students' perceptions of mathematics interventions; this information is necessary to help develop effective interventions. Multiple studies have shown that intervention efficacy can be increased when the participants believe that the intervention is helpful and easy to use. To inform future research studies as well as support classroom practices, the authors conducted a synthesis of 22 mathematics intervention studies for students with learning disabilities. The authors included studies that measured social validity of the interventions. The research question guiding this systematic review was: what are the characteristics of social validity measures used in intervention studies?

METHOD

This systematic review of social validity literature included reviewing 22 studies related to the social validity of mathematics interventions. Researchers coded included studies for a variety of variables, with the focus on presence of learning disability, social validity assessments for both teacher and student, and instructional setting. All studies were coded by two of the authors and agreement of each code was compared to determine interrater agreement. Across all articles, the interrater agreement was an average of 87.0%. The authors held meetings to discuss each of the discrepancies; the authors reviewed the code together, reviewed the original study to identify any information that one of the authors missed, and agreed on a final code. The final codes were used in data analyses.

RESULTS

The results of this poster presentation represent preliminary findings of a larger study. Based on the results of previous research, the authors expect to find a positive correlation between students perceived validity of interventions and effectiveness of those interventions. First, as part of the systematic review, we examined the characteristics of the included studies in order to inform our future data analysis. We present those results here. Some preliminary finding within the demographics are as follows; across the studies, there were 200 total participants, of which 164 (82%) had a diagnosed learning disability. Many studies *(k* = 16) included only students with learning disabilities; other disabilities represented in the studies included: intellectual disability (*n* = 13), other – not specified (*n* = 8), emotional behavioral disability (*n* = 4), speech language impairment (*n* = 2), ADHD (*n* = 2), autism spectrum disorder (*n* = 2), other health impairment (*n* = 1), Deaf or hard of hearing (*n* = 1), and auditory processing disorder (*n* = 1). Students in the studies were between grades 3 and 12. Below is a table that summarizes the social validity measures used across the mathematics intervention studies.

Authors (year)	Measure Type	Total Questions	Questions Provided	Quantitative Results
Brawand et al. (2020)	Scale	NR	No	No
Bryant et al. (2015)[a]	Open-ended questionnaire, Interview	8	Yes	No
Calhoon & Fuchs (2003)	Scale	6	Yes	Yes
Case et al. (1992)	Interview	NR	No	No
Cass et al. (2003)	Interview	NR	No	No
Cuenca et al. (2016)	Interview	NR	No	No
Flores et al. (2014)	Open-ended questionnaire	NR	No	No
Freeman-Green et al. (2015)	Scale, Open-ended questionnaire	7-10	No	No
Kellum et al. (2020)	Open-ended questionnaire	9	No	No
Milton et al. (2019)	Scale	NR	No	No
Ok & Bryant (2016)	Scale, Interview in-person	20	Yes	Yes
Owen & Fuchs (2002)	Scale	5-8	Yes	Yes
Park et al. (2021)	Interview	NR	Yes	No
Satsangi et al. (2020)	Interview	NR	No	No
Satsangi & Bouck (2015)	Interview	4	Yes	No
Satsangi et al. (2016)	Interview	9	No	No
Satsangi et al. (2020)	Interview	NR	No	No
Satsangi et al. (2018a)	Other	NR	No	No
Satsangi et al. (2018b)	Interview	NR	No	No
Satsangi et al. (2018c)	Interview	NR	No	No
Shin & Bryant (2017)	Scale, Open-ended questionnaire	5, 9	No	Yes
Strickland & Maccini (2012)	Scale, Interview in-person	NR	Yes	Yes

DISCUSSION

There were some limitations of this study. Some information was not available as had been hoped, such as setting and duration of the interventions. Also, many studies with more robust sample sizes did not meet inclusion criteria for the systematic review. Even so, there is valuable information to be found in this systematic review and the results will help support efficacy in mathematics interventions and inform future research. Several questions the authors plan to investigate in the larger research study are listed here.

First, to what extent is social validity measured in mathematics intervention studies for students with learning disabilities, including according to design type (e.g., group design, single case design), mathematics content area (e.g., word problem solving) and participant grade level?

Second, What are the characteristics (e.g., what aspects of social validity are measured, types of items, response format) of the social validity measures used in mathematics intervention studies with students with learning disabilities?

And third, What are the reported social validity outcomes as related to the implementation of mathematics interventions for students with learning disabilities?