THE SCIENCE OF MATH

Common Misconceptions: Executive Function Interventions Will Improve Math Outcomes

MISCONCEPTION

Targeted interventions on increasing executive functioning will increase mathematics performance. Many people believe that improving executive functioning through direct training (e.g., working memory, cognitive training programs) will improve mathematics achievement.

TRUTH

Most evidence suggests there is a small to negligible relationship between cognitive measures and student response to intervention.[a] In the few studies examining the causal link between executive function interventions and academic outcomes, researchers only found improvements on measures of executive function but no improvements on academic achievement.[b]

What Does the Evidence Support?

Students at-risk for math disabilities also may have difficulties with attention, motivation, self-regulation, and working memory.[cd]

Interventions should be tailored and intensified according to students' needs using direct evaluation of students' math skills to make low-inference decisions about intervention tactics.

Effective use of evidence-based instructional approaches negates the potential influence of executive function difficulties.[e]

IMPLICATIONS FOR PRACTICE

Interventions should:

(1) include self-regulation and reinforcement strategies;

(2) minimize cognitive load on working memory through explicit instruction and breaking down problems into smaller, more manageable parts;

(3) minimize language load by using visual representations;

(4) include fluency-building practice.[f]

[a]Burns (2016)
[b]Jacob & Parkinson (2015)
[c]Compton et al. (2012)
[d]Montague (2007)
[e]Burns et al. (2019)
[f]Fuchs et al. (2018); Powell & Fuchs (2015)

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