



Using the theory of planned behavior to explain STEM instructors' use of research-based instructional strategies: What we have learned from math and biology



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Introduction

The theory of planned behavior (TPB) has been identified as a change theory that is broadly applicable to studying change in teaching and learning in STEM (Reinholz & Andrews, 2020).

Structural equation modelling was used to apply the TPB in two contexts to explain instructors' use of **research-based instructional strategies (RBIS)** for **4-year college math (4YCM)** instructors (n = 260) after participating in professional development and for **2-year college biology (2YCB)** instructors (n = 377) reporting their current use of RBIS.

Can the TPB explain instructors' use of RBIS in two distinct contexts?

Results

Similarities between contexts:

- The TPB is effective in explaining instructors' RBIS use
- The strength of relationships between core TPB constructs is consistent **between contexts**

Differences between contexts:

- Class size and course coordination influenced RBIS in **4YCM** but **not** in **2YCB**
- Social norms influence intent to use RBIS in **2YCB** but **not** in **4YCM**

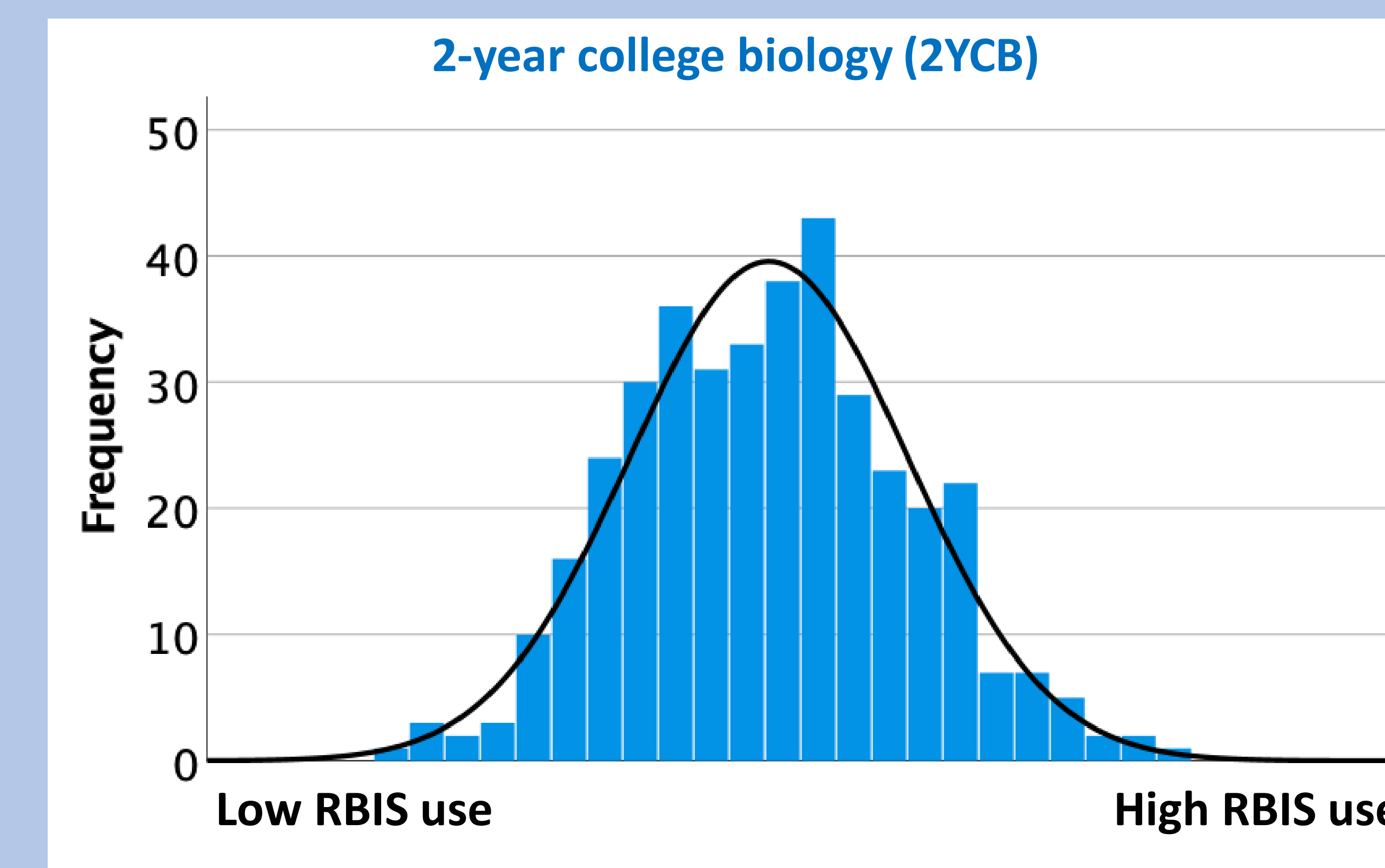
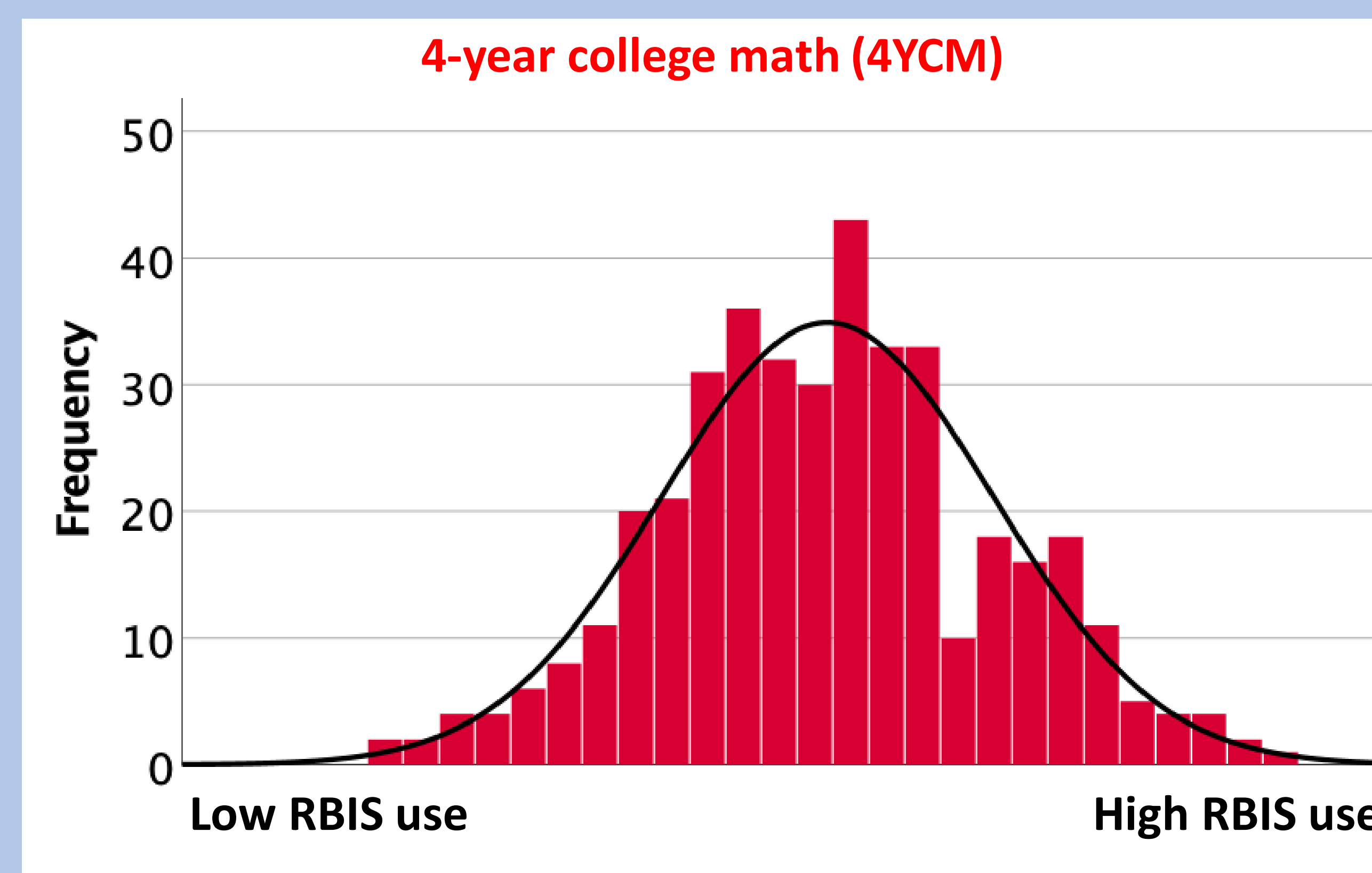
Implications

Use of the TPB to study professional development can:

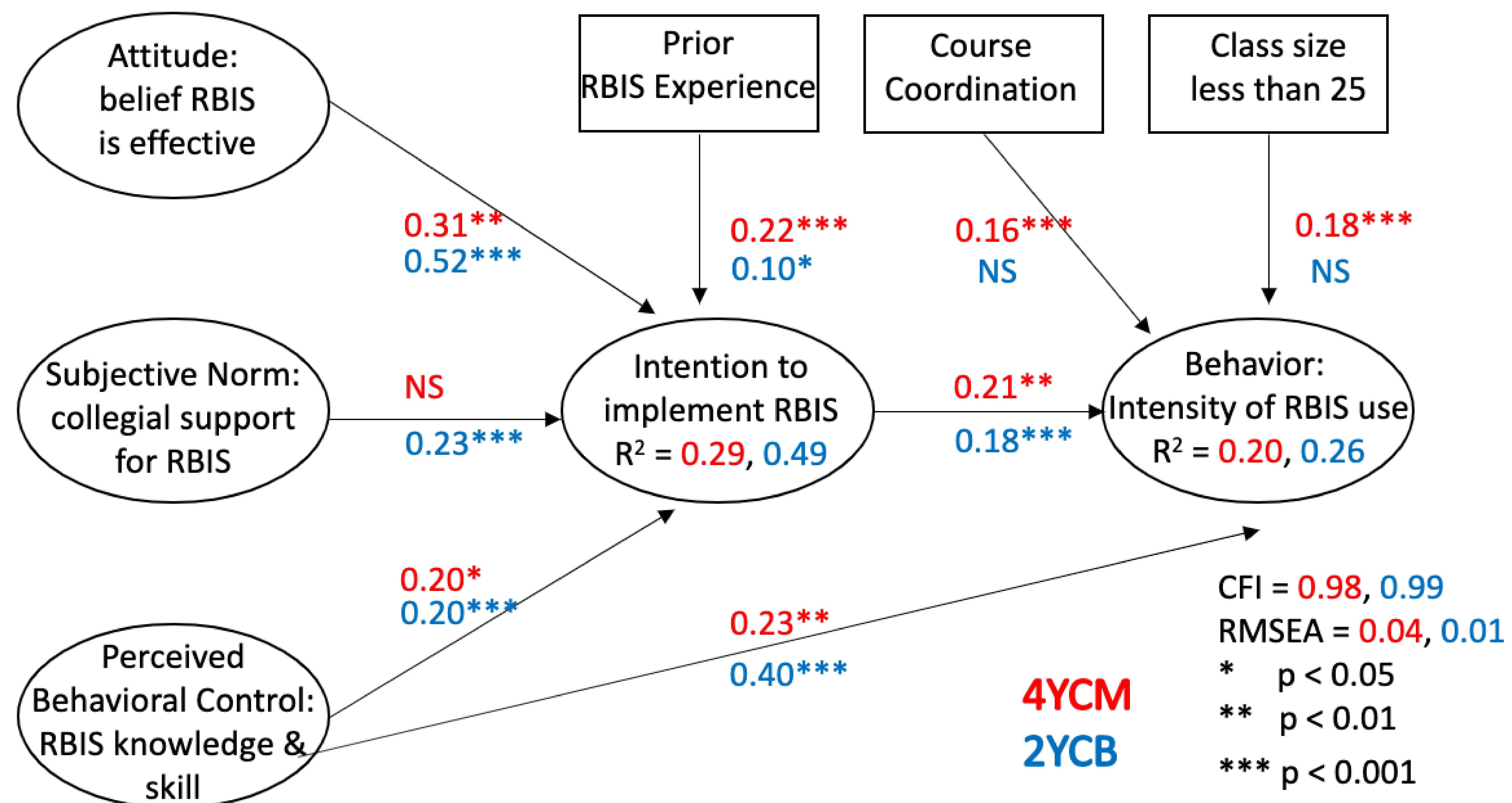
- Enable comparisons among diverse STEM change contexts
- Identify contextual differences and similarities
- Increase the generalizability of findings
- Accelerate change in STEM

Teaching-focused change initiatives should emphasize TPB components that can influence teaching practice. For example, professional development can strengthen instructors' RBIS knowledge, skills, and attitudes, which in turn increases their RBIS use. <https://tinyurl.com/2c4t2dms>

Instructors' use of research-based instructional strategies (RBIS)



Theory of planned behavior (TPB) SEM



Note: numbers along arrows are standardized regression coefficients