

# The Role of Mathematical Vocabulary in the Development of Mathematical Skills for Spanish-Speaking Students

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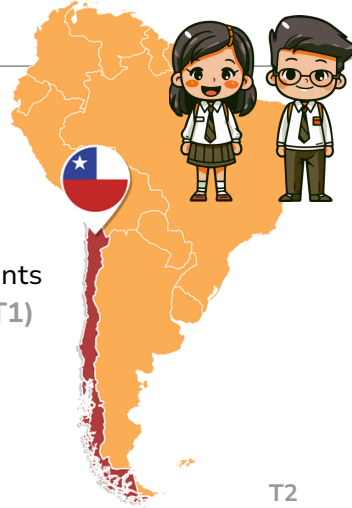


**DOES MATH VOCABULARY PREDICT THE CHANGE IN STUDENTS' PERFORMANCE ON MATH TASKS FROM ONE ACADEMIC YEAR TO THE NEXT?**

Yes! ..sort of...

Let's explain

Spanish-speaking students were tested at Time 1 (T1) and Time 2 (T2).



T1  
(Grade 2)

T2  
(Grade 3)

46% girls

N = 87

Age (average): 7y11mo

48% girls

N = 77

Age (average): 8y11mo

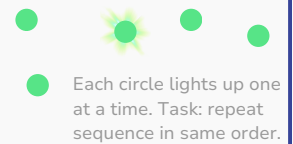
## RECEPTIVE VOCABULARY T1

"Point to the truck"  
# of correct answers



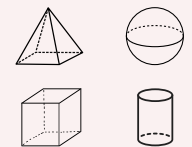
## SPATIAL SPAN T1

× 3 errors / level  
# of correct answers



## MATH VOCABULARY T1 T2

"Point to the cube"  
# of correct answers



## ARITHMETIC FLUENCY T1 T2

⌚ 3 mins

# of correct answers

$$6 + 7 = \quad 5 \times 3 =$$

$$9 - 4 = \quad 8 \div 2 =$$

## CALCULATION T1 T2

× 6 consecutive errors  
# of correct answers

$$53 + 9 = \quad 12 + 19 =$$

$$17 - 8 = \quad 32 - 18 =$$

$$4 \times 6 = \quad 9 \div 3 =$$

## APPLIED PROBLEMS T1 T2

× 6 consecutive errors  
# of correct answers

Maria has ten toys. Jess has eleven and gives two to Maria. How many toys does Jess have now?

## RESEARCH HIGHLIGHTS:

We evaluated **changes** in math vocabulary and math skills.

Investigated **concurrent** and **longitudinal** associations between general language skills (receptive vocabulary) and math vocabulary to students' math performance (arithmetic fluency, calculation, applied problems).

We studied **Spanish-speaking students** in early elementary school.

A group that has rarely been studied (Lin et al., 2021).

Domain-general and domain-specific skills differentially support mathematical development.

**Arithmetic Fluency:** working memory (spatial span) not vocabulary explained variance in change from T1 to T2.

**Calculation:** math vocabulary (not receptive vocabulary) explained variance in the change from T1 to T2. This suggests that math vocabulary might capture variability in knowledge specific to mathematics.

**Applied Problems:** math vocabulary and receptive vocabulary together explained variance in the change from T1 to T2. This suggests that both domain-general (receptive) vocabulary and domain-specific (math) vocabulary are key aspects of mathematical performance in tasks that have large language demands (Lin et al., 2021; Peng et al., 2020).