

## RESEARCH QUESTION

**What are the effects of the Voices Together Teacher Toolbox on 1) students with autism and 2) their teachers?**

## BACKGROUND

**AUTISM SPECTRUM DISORDER (ASD):** Range of symptoms characterized by repetitive behaviors and challenges with social skills and speech

**MUSIC THERAPY:** Yields improvements in language and social abilities in children with autism<sup>1</sup>

**VOICES TOGETHER (VT):** Music therapy program based in central NC. Combines educational techniques and music to empower people with mental disabilities. Implemented by professional music therapists weekly

**TEACHER TOOLBOX (TT):** Program that trains teachers in both the theory behind the VT intervention and the music tools necessary to incorporate VT into their classrooms daily

## EXPERIMENTAL DESIGN

**SUBJECTS:** 9 Special Education elementary classrooms in North Carolina  
**Control:** VT n = 4 **Experimental:** TT n = 5

### STUDENT MEASURES:

Track improvements in language and social abilities throughout program

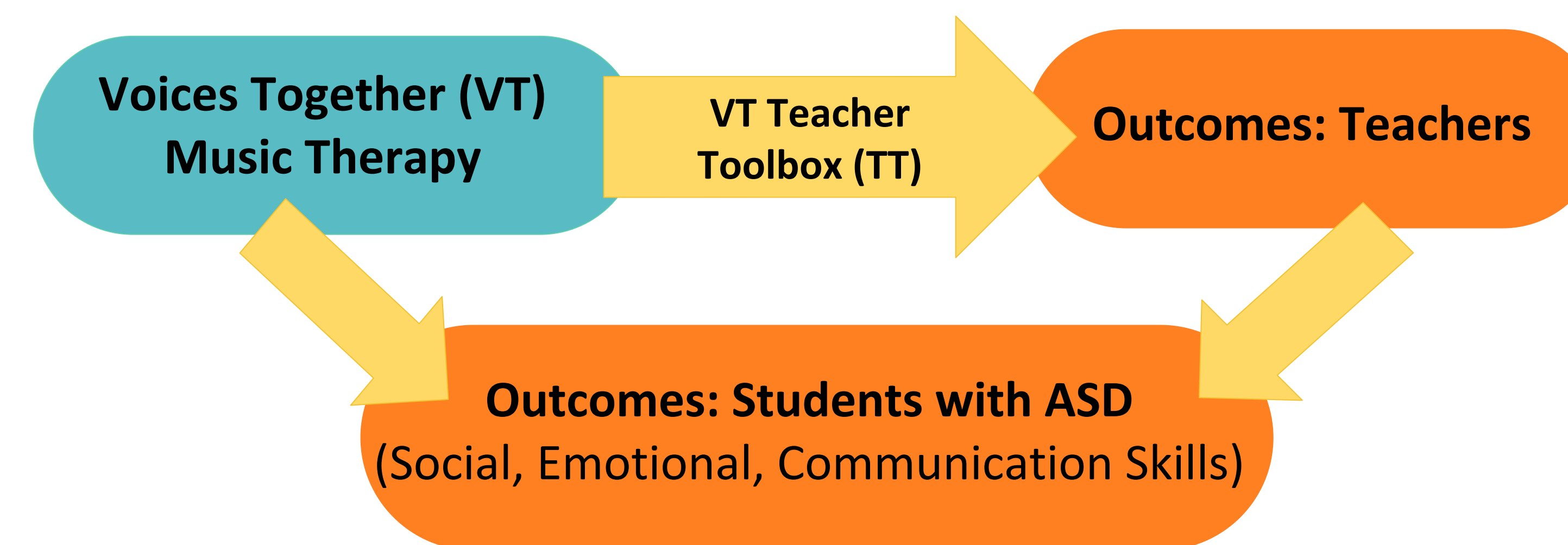
**Probes:** behavioral assessment that measures social and language ability at 4 points throughout intervention

### TEACHER MEASURES:

Gauge teacher experience prior and throughout Toolbox training

#### Teacher practices survey:

Teachers' background demographics and prior knowledge on teaching practices



## PARTICIPANTS

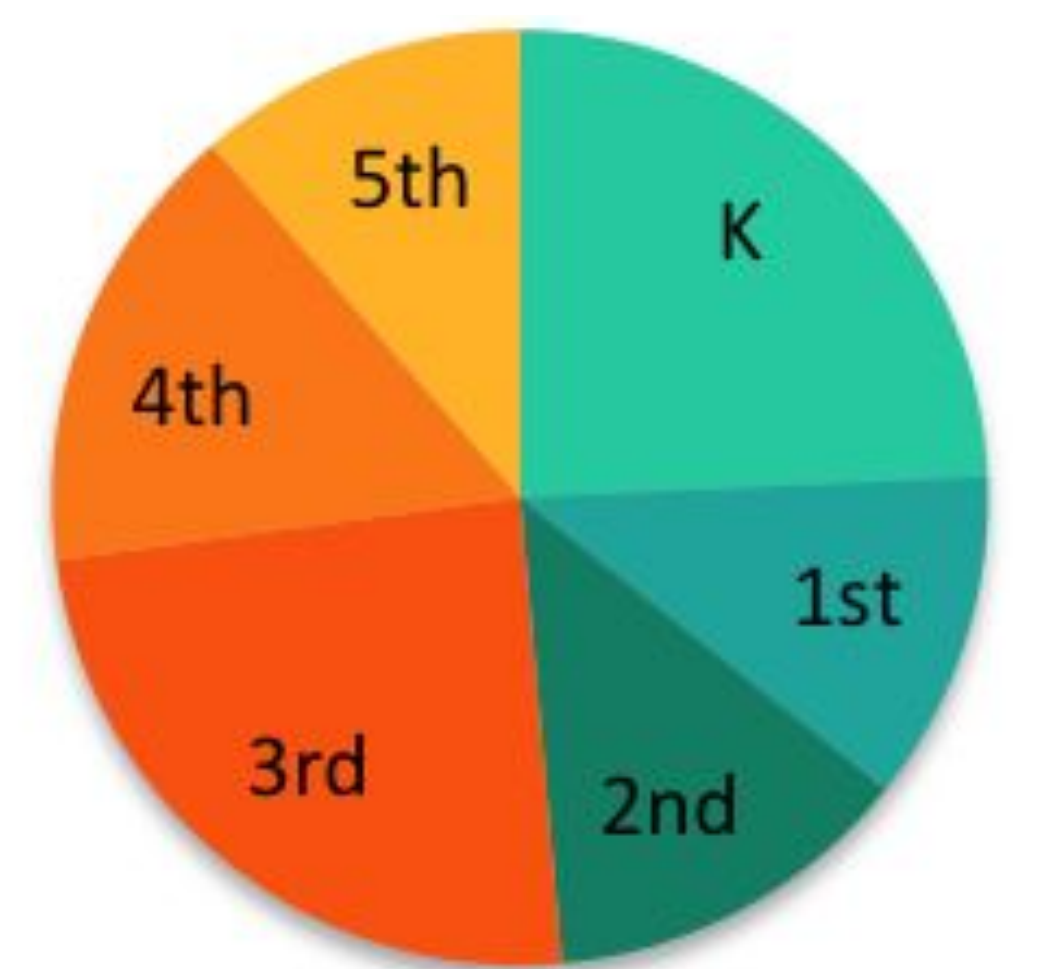
**STUDENTS:** n = 70

Male: **81%** Female: **19%**

Baseline Language Level<sup>2</sup>: **3 / 5**

Language level of neurotypical 2 y.o.

Student Grade Distribution

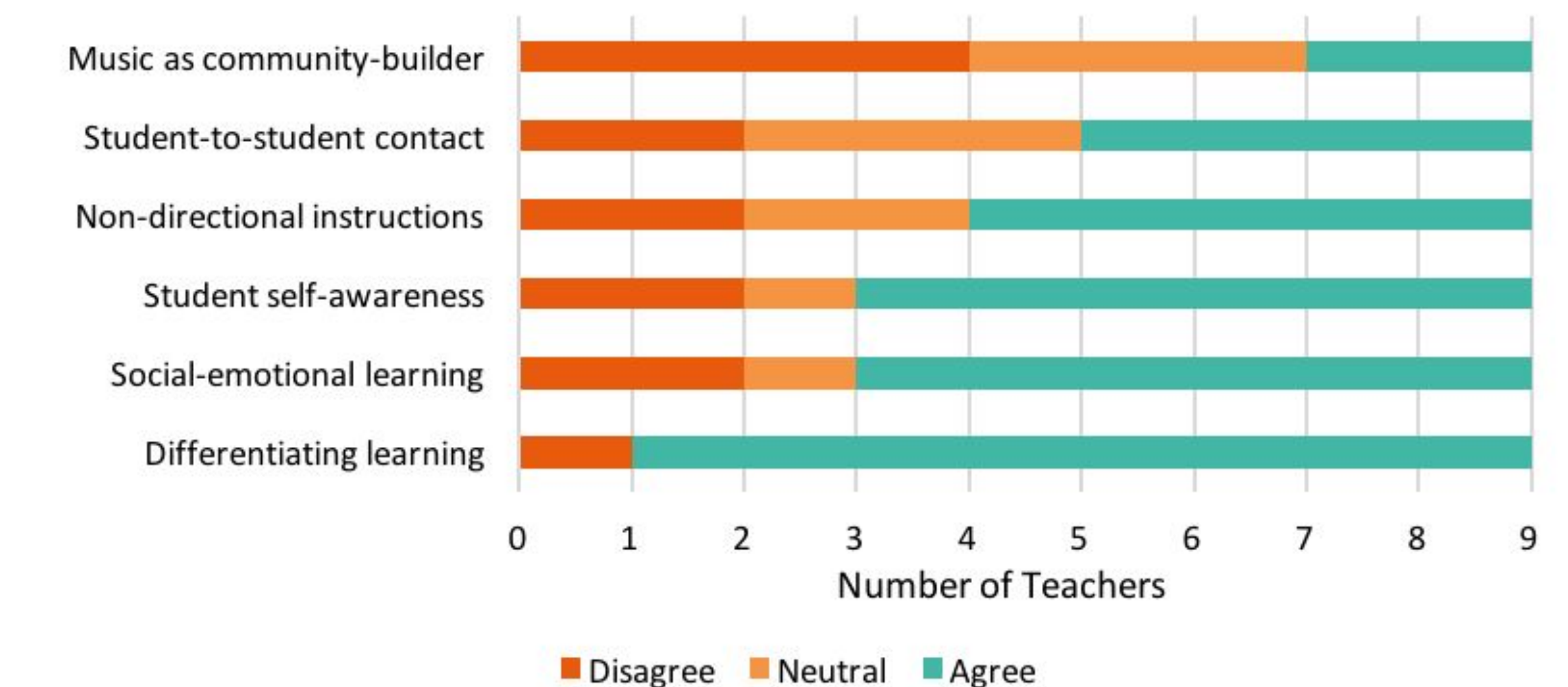


**TEACHERS:** n = 9

**5** have degree in Special Education

**8** have taken 2+ courses in ASD

Pre-Training Knowledge of Teaching Strategies



## RESULTS

### Student Outcomes in TT vs. VT over time:

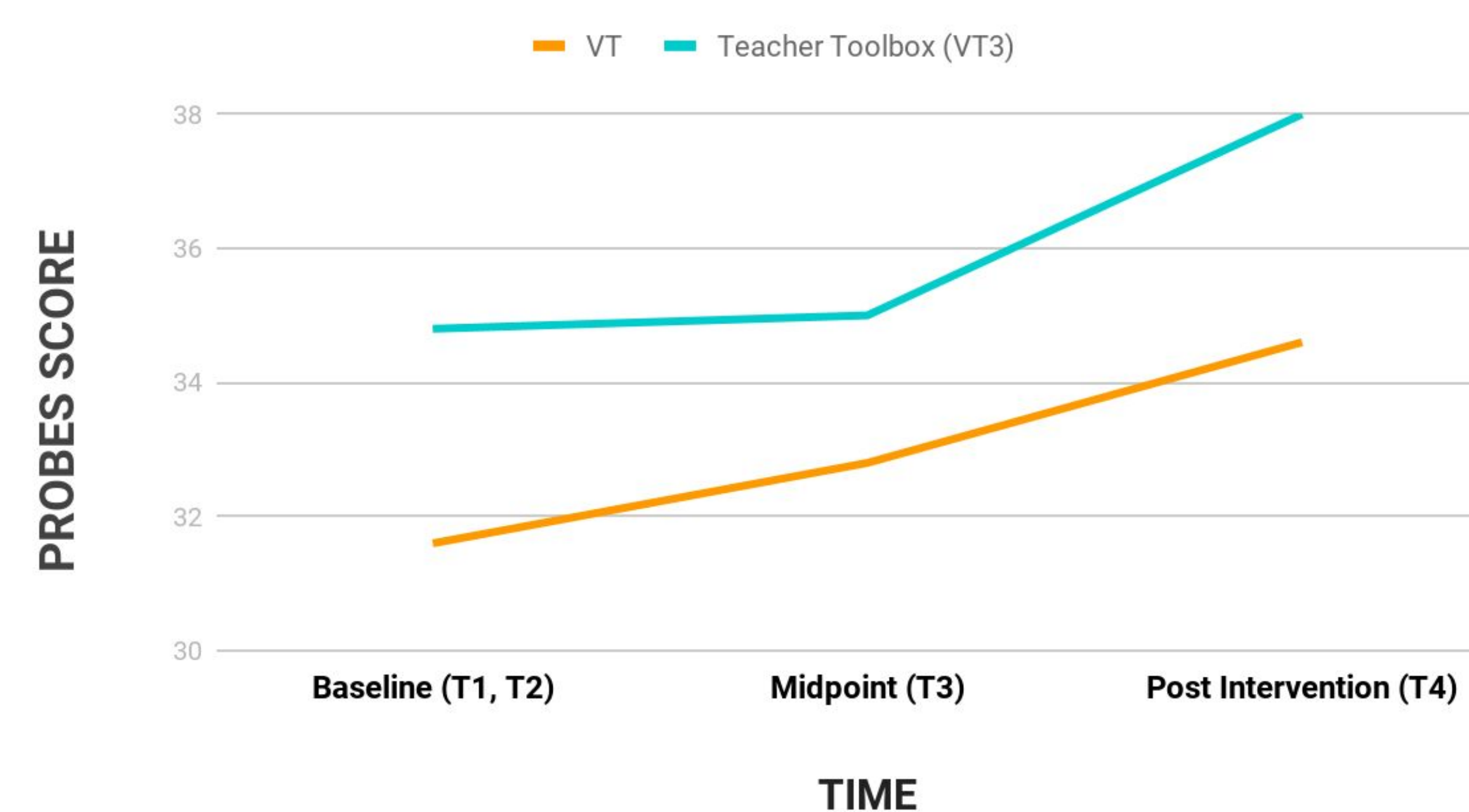
**TT:** slow improvement T2-T3 → increased improvement T3-T4

**VT:** steady improvement across intervention

### Interpretation:

Change in rate of improvement associated with teachers' increasing familiarity and understanding of the TT program over time

**\*\*Discrepancy in baseline measures explained by previous exposure to VT music therapy by students in TT group**

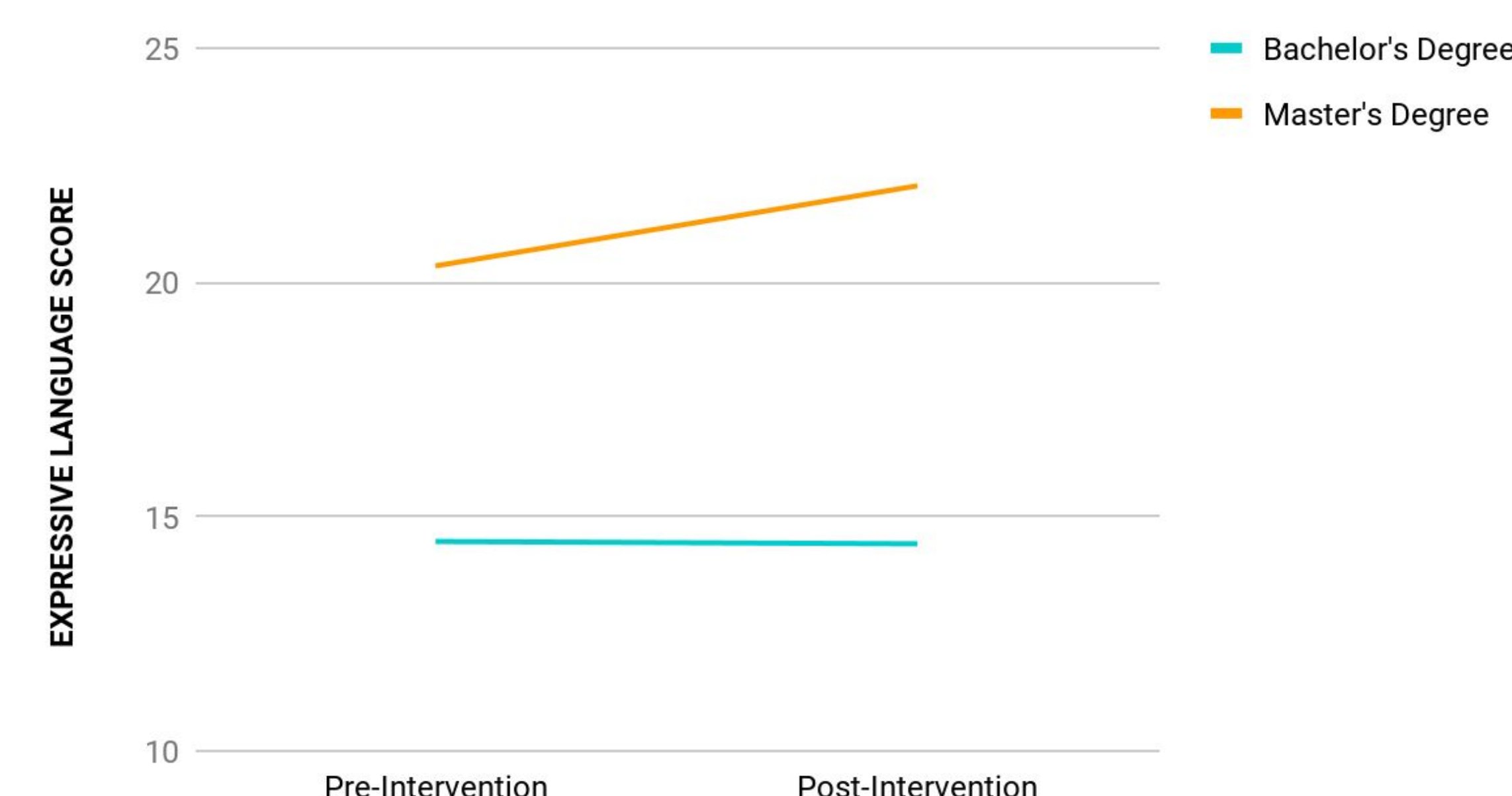


### Teacher Practices Survey Analysis:

Differences in most student **outcomes** by **varied teacher backgrounds** were not significant

Teachers who had obtained their Master's Degrees had students who improved in Expressive Language over the year compared to the students of teachers who had stopped their education at a Bachelor's Degree

Teacher's Degree vs. Expressive Language Score



## CONCLUSIONS & NEXT STEPS

Preliminary data show positive responses to TT training, however nuanced associations are not yet fully understood

### FUTURE DIRECTIONS:

Further analyze student probe data and teacher outcome variables to quantify program efficacy and understand complexities; Adapt TT program accordingly

### IMPLICATIONS:

Provide special education teachers with a cost-effective and relatively simple way to improve student outcomes without the need of a music therapist

## ACKNOWLEDGEMENTS

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## REFERENCES

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- Tager-Flusberg, H., Rogers, S., Cooper, J., Landa, R., Lord, C., Paul, R., Rice, M., Stoel-Gammon, C., Wetherby, A., & Yoder, P. (2009). Defining spoken language benchmarks and selecting measures of expressive language development for young children with autism spectrum disorders. *Journal of Speech, Language, and Hearing Research*, 52(3), 643-652.