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Official Title: Talk STEM Familia: Dual-Language Academic Vocabulary-Building Technology to Improve Educational, Career, and Health Outcomes Among Latinx Students

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STUDY PROTOCOL

Participant Recruitment, Enrollment, and Overall Design

Families were recruited to participate in the evaluation study via distribution of study information through school districts, community organizations, and community health promoters around the United States. Interested parents who contacted project staff were provided additional information about the study and screened for eligibility; those eligible were consented via phone call or sent online Qualtrics consent form. After signing the consent, primary parents and their participating student completed the pretest/baseline (T1) assessment and then were randomized into the treatment group or waitlist control group. The group assignment lasted 6 months. Parent/student dyads in the treatment group received the Mi Familia STEM program app and Amazon Alexa with skill programmed onto it. Parent/student dyads in the waitlist control received an Amazon Alexa without the Mi Familia STEM program. Treatment group dyads received reminder text messages to use Mi Familia STEM with their child 3/days a week for approximately 10-minutes. Control group dyads were able to use their Amazon Alexa for normal use. At 3-months, both treatment and waitlist control groups were administered the mid-treatment (T2) questionnaire. Both groups received $100 for completing the T2 assessment. At 6-months from baseline, both waitlist control and treatment groups received post-treatment (T3) questionnaire. The treatment group also completed a consumer satisfaction and usability questionnaire. After completion of T3 questionnaire, treatment and control dyads received $100. Following T3, the waitlist control group also received access to the Mi Familia STEM app and Amazon Alexa skill.

Mi Familia STEM Program

The Mi Familia STEM program is a dual-language, vocabulary acquisition learning tool that employs integrated web-app and smart speaker technology (phone app and Amazon Alexa Skill) to engage English learner students, grades 4-8, and their families in evidence-based, culturally relevant, home-based learning activities on 72 scientific academic vocabulary (SAV) words that support success in middle and high-school STEM classes.

Measures

T1, T2, and T3 questionnaires measured student knowledge of academic vocabulary meaning and usage (Academic Vocabulary Meaning (AVM) and Academic Vocabulary Word Usage (AVWU); student SAV usage behaviors and behaviors related to academic learning (Academic Vocabulary Usage Behaviors (AVUB) and Academic Learning Behaviors (ALB); student confidence in using SAV words (Academic Vocabulary Confidence (AVC)); and student interest in choosing STEM careers (STEM).

T1, T2, and T3 questionnaires also measured parent knowledge of SAV meaning and usage (Academic Vocabulary Meaning (AVM) and Academic Vocabulary Word Usage (AVWU); Parent SAV usage behaviors (Academic Vocabulary Usage Behaviors (AVUB)); parent confidence using SAV words (Academic Vocabulary Confidence (AVC)); and parent academic support behaviors (Academic Enabling Behaviors (AEB)).

STATISTICAL ANALYSIS PLAN

The evaluation study had three main goals: (a) determine whether statistically significant condition effects were found between T1 and T3 on the outcome measures; (b) determine the program effect sizes; and (c) determine the parents' and students' reaction to the program and

amount of program use. The evaluation of group effects included an intent-to-treat analysis using mixed-effects growth models with the SAS PROC MIXED software, which was estimated with maximum likelihood. Models included an intercept, defined as the T1 assessment, time coded in months since the T1 assessment, a main effect for condition, and a condition × time interaction. The condition × interaction tests whether a change in the outcome from the T1 to T3 assessment significantly differed by condition and is a direct test of the program's efficacy. Cohen's *d*-statistic is provided as a measure of effect size for the condition × time effects and follows the convention of .2, .5, and .8 for small, medium, and large, respectively. Examining descriptive statistics for the user satisfaction items provided information on parents' and students' reactions to the program.