

Abstract

The present study seeks to explore the validity of the Usage Rating Profile-Intervention Revised (URP-IR) measure in an academic context and to examine whether the URP-IR, that is, teachers' self-perceptions of the usability of an intervention predicts student performance on a curriculum specific academic outcome. This investigation examines intervention usage in a multi-tiered kindergarten vocabulary intervention setting to better understand teacher intervention adoption within a response to intervention framework.

Teacher Intervention Usage in Multi-tiered Early Education Settings

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Introduction

- Educators in early education settings are increasingly required to adopt research-based interventions. Yet the implementation of these interventions, as intended, is very variable, with deviations from the planned intervention resulting in significantly lower performance (Justice et al, 2008; O' Donnell, 2008).
- Research that examines the factors that influence teacher intervention adoption has focused primarily on individual level factors (Kazdin, 1980; Sterling-Turner & Watson, 2002) and has paid little attention to early education settings (Zvoch et al., 2007).
- The omission of additional factors—and particularly environmental factors---to predict and explain teacher intervention usage is discordant with the increasing focus in schools on multi-tiered interventions.
- To better address the constellation of factors that influence teachers' integration of interventions into their routine practice, a new more ecologically valid measure was proposed to assess multiple influences at the individual, intervention and systems level that affect intervention adoption, the Usage Rating Profile-Intervention Revised (URP-IR) (Chafouleas, Briesch, Neugebauer and Riley-Tilman, in press).
- However, the psychometric validity of the URP-IR measure with academic interventions as well as its predictive validity for explaining academic performance is still untested.
- The present study seeks to explore both of these questions in a multi-tiered early elementary context.

Measures

Usage Rating Profile-Intervention Revised: A empirically validated self-report questionnaire to assess six factors that capture individual, intervention and environmental influences that impact intervention use and maintenance over time. This measure using a 6 point likert scale was administered after teachers had participated in their respective intervention trainings.

Expressive Curriculum Specific Target Word Measure: Students define the word aloud (e.g., Tell me what the word fleet means?) This assessment is a researcher developed measure containing 26 target word items for a total of 52 points.

The Peabody Picture Vocabulary Test-IV (PPVT-IV, Dunn & Dunn, 2007): The PPVT is a commonly used standardized, norm-referenced, individually-administered test of receptive language and vocabulary. The student is asked to point to the picture that best represents the meaning of the word presented by the examiner. This test was administered pre intervention to determine risk status.

Expressive Vocabulary Test-2 (EVT-2, Williams, 2007) is a standardized, norm-referenced, individually-administered test of expressive language and vocabulary. Students view a picture and are asked to respond with a one-word answer to a stimulus question. The EVT-2 was administered pre and post intervention as a control variable.

Implementation Fidelity: Teachers were observed on 1-2 occasions over the course of the intervention, with trained observers recording whether curriculum specific activities were completed, materials used and pedagogy implemented (5 items per activity). An average implementation fidelity score across items, activities, and observations was calculated.

URP-IR Predictive Validity Results

Research Question 2: Does the URP-IR explain additional variance in student post-intervention target vocabulary performance when controlling for students' previous language and literacy performance and intervention implementation fidelity for students who are receiving Tier 1 instruction and those receiving supplemental Tier 2 instruction?

Data Analysis

Data were analyzed using SAS version 9.3 with a two-level model fit using the PROC MIXED statement nesting students within classrooms and to explore student performance outcomes (level 1) as a function of both level 1 predictors (student previous performance) and level 2 predictors (teacher URP-IR scores and implementation fidelity). Our model building commenced with an unconditional model followed by step wise integration of models with controls (previous performance on curriculum and standardized vocabulary measures), followed by our covariate (implementation fidelity) and lastly our question predictor (URP-IR scores). Models including individual interaction terms for implementation fidelity, and at risk status in the case of the Tier 1 intervention were fit. However, there interaction terms were not statistically significant. Below we present our final models.

Table 3. The final multilevel models for Post intervention Expressive Target Word Measure for Tier 1 and Tier 2 classrooms.

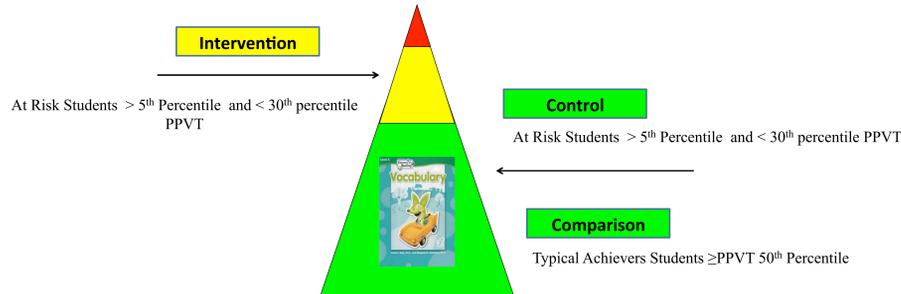
	TIER 1	TIER 2
Fixed Effects:		
Intercept	8.98(.75)***	14.80 (1.29)***
EVT	.18(.04)***	.25(.07)***
Pre-Target Vocabulary	.82(.21)***	.35(.45)
Intervention Group	2.53(.84)**	
Implementation Fidelity		35.39*
Acceptability		
Understanding		
Feasibility		4.68(2.68)~
System Climate	2.77(1.02)**	
System Support		
Random Effects:		
σ^2_{μ}	13.32(3.76)**	53.22(15.36)***
σ^2_{ϵ}	29.11(2.69)***	41.69(6.4)***
Goodness-of-Fit		
-2LL	1793.3	912

In the Tier 1 classrooms, 33% of students curriculum specific vocabulary is accounted for by between classroom level differences and 52% of the variation in curriculum specific vocabulary is accounted for by between classroom differences in the Tier 2 classrooms.

Methods

Sample

- Kindergarten students
- ✓ 23 schools in Connecticut, Oregon, and Rhode Island
 - ✓ 54 Tier 1 Teachers
 - ✓ 48 Tier 2 Interventionists
 - ✓ 193 Intervention: at risk students receiving Tier 2 intervention (35%)
 - ✓ 187 Control: at risk students receiving Tier 1 intervention (35%)
 - ✓ 173 Comparison: not at risk students receiving Tier 1 instruction (31%)



- All students received the Elements of Reading – Vocabulary Curriculum Tier 1 (Beck & McKeown, 2004)
 - ✓ 15-20 minutes per day, 5 days a week
 - ✓ 21 weeks, 5 new target words per week
- Small group (3-4 students) Tier 2 Intensive Vocabulary Intervention
 - ✓ 30 minutes per day, 4 days a week
 - ✓ 21 weeks, focused on 3 of the target words learned in the classroom

Instrument Validation Results

Research Question 1: Is the URP-IR a valid and reliable measure of intervention usage in an academic setting (a vocabulary intervention context) ?

Data Analysis

Data were analyzed with regard to the hypothesized factor structure and internal consistency using confirmatory factor analysis procedures (Pett, Lackey, & Sullivan, 2003). Factor analyses were employed using WLSMV estimation techniques with MPLUS 6.11. Reliability estimates using Cronbach' s alpha determined that all subscales exhibited acceptable reliability.

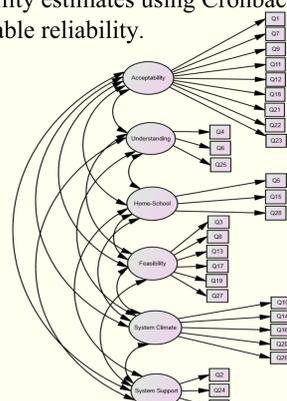


Table 1 Summary of Reliability Statistics for URP CFA Subscales for Teachers and Interventionists

Subscale	Items	Average inter item r	SD of inter item r	
Acceptability	1, 7, 9, 11, 12, 18, 21, 22, 23	.44	.18	.90
Understanding	4, 6, 25	.42	.23	.68
Family-School	5, 15, 28	.64	.08	.84
Feasibility	3, 8, 13, 17, 19, 27	.31	.16	.71
System Climate	10, 14, 16, 20, 26	.41	.09	.78
System Support	2, 24, 29	.38	.07	.65

Fig. 1. Confirmatory factor analysis structure and loadings for the final model

Table 2 CFA Fit Indices for the Six Factor Model

Factor Model	CFI	TLI	RMSEA	Decision
6 Factor Model	.94	.94	.09	Acceptable Fit

Discussion

- Results of the current study providing supporting evidence that all six factors of the URP-IR are valid and reliable in the context of academic interventions.
- Findings with the present sample indicate that these factors may be more or less relevant for academic performance depending on the intervention, student population, and degree of instructional intensity.
- Indeed, the present study found that in an intensive intervention context (Tier 2) intervention level factors such as implementation fidelity and teachers' perceptions of the feasibility of the intervention were statistically significant factors in predicting student vocabulary performance post intervention when controlling for students previous level of vocabulary performance. However, individual level factors as well as systems level factors were not statistically significant predictors of performance.
- By contrast, for students in classrooms receiving a less intensive core classroom intervention (Tier 1) the factors that explained significant variance in vocabulary performance after the intervention were teachers' perception of the climate of their school system and students previous performance and designation as at risk for reading difficulties.
- Future research should explore whether the URP-IR may be beneficial in planning and evaluating intervention efforts across different instructional tiers, and whether it can facilitate individualized consultation with teachers to support intervention usage and maintenance.