Critical Review:

Does Classroom- -

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Introduction

** This paper was created as a required assignment for the CSD9639 Evidence Based Practice for Clinicians course at Western. While it has been evaluated by course instructors for elements of accuracy and style, it has not undergone formal peer-review.*

baseline scores on the Clinical Evaluation of Language Fundamentals – Revised (CELF-R) (Wiig, Secord, & Semel 1987). A range of communication problems were present in the condition groups, including verbal fluency, semantics, expressive organization, pragmatics, word finding, syntax, and oral/written expression. Subjects were matched by age within a 6-month range, and, where possible, by gender and type of communication impairment.

Classroom-based intervention employed the Language in the Classroom (LINC) program, which was previously developed by the one of the study authors (Prelock, Miller, & Reed, 1995). In this intervention, an SLP, an SLP student, and a LINC-trained teacher collaborated to plan and deliver LINC activities, which incorporated curricular materials and goals. No details on specific therapeutic techniques were reported in the study, but a lesson plan included in the appendix indicates that the modeling, prompting, and cuing of target vocabulary was used with some of the subjects. Curricular and subject-specific communication goals were targeted in this intervention. Intervention was provided on a weekly basis in 30-45 minute sessions. Pull-out intervention was conducted once or twice a week in 30-45 minute sessions. No details on the specific therapeutic techniques used during these sessions were provided. In both conditions, intervention was provided to the matched pairs for 1 to 3 years, throughout the school year.

Audio recorded language samples of 100-200 utterances made by subjects in conversation with the SLP were obtained twice a year (spring and fall). Systematic Analysis of Language Transcripts (SALT) was applied to orthographic transcripts of language samples. The SALT analysis produced the following

Results revealed a significant difference in test gains betweens the three condition groups (ANOVA p = 0.045). A Duncan post-hoc analysis revealed that the collaborative group test gains were significantly higher than those of the independent and pull-out groups.

A critical review of this study found several inherent weaknesses that may have undermined the results. First, the lack of assessor blinding may have led to examiner bias during pre- and post-intervention vocabulary testing, which involved a degree of subjective interpretation of responses. Further, any bias present may been magnified in the 13% of pre-test scores taken within the session by one examiner. Second, treatment confounds may have influenced the results of this study. Subjects in the classroom-based group received a minimum of 60 minutes of pull-out intervention in addition to their classroom-based intervention. Third, the proportion of articulation and language disorders present in each condition group was not controlled for, and no attempts to examine impairment-based differences were reported. The collaborative group had a smaller proportion of language-disordered subjects (42%) when compared to the independent and pull-out conditions (73% and 67%, respectively). Further, given that vocabulary is a language skill, and that vocabulary was the only measure of test gains obtained, the inclusion of subjects with solely articulation-based impairments raises questions about the content-validity of this study's design. In consideration of these significant weaknesses, it was concluded that this study provides equivocal evidence that classroom-based therapy is as effective as pull-out therapy.

Discussion

Overall, this critical review has provided suggestive evidence that classroom-based intervention provides treatment results that are comparable to those of traditional pull-out intervention. However, the suggestive evidence was only found in 2 of the 4 articles, and is thus quite limited in scope.

Two studies examined the relative efficacy of the pull-out and classroom-based models in producing vocabulary gains. Only one of these studies provided a high level of evidence (Wilcox, Kouri, & Caswell, 1991). This same study also produced compelling evidence for superior generalization of vocabulary from the classroom-based model (Wilcox, Kouri, & Caswell, 1991). However, as this evidence is limited to one study, replication of these results is required to confirm this effect. Unfortunately, the second study that used vocabulary growth as a measure of treatment gains contained design flaws that severely compromised its findings (Throneburg et al., 2000). Most detrimental, was the fact that subjects in this study had both speech and language impairments, while the intervention and measuring procedures targeted solely a language skill (vocabulary). Therefore, since there was no apparent attempt to group impairment types during data analysis, the findings of Throneburg et al. cannot be used to answer the research question of the present study.

Broader measures of treatment gains were used in 2 of the 4 studies. One such study produced suggestive evidence that classroom-based intervention can produce comparable CELF-P score gains to pull-out intervention (Valdez & Montgomery, 1997). While no significant difference was found between groups in this randomized block study, the stratification of subject by impairment severity (mild, moderate, severe) revealed an interesting pattern in treatment gains. From the figures provided, classroom-intervention appeared more successful in improving scores of subjects with severe impairments, while pull-out intervention appeared to produce greater overall movement of severely and moderately impaired subjects into the mild range of impairment. Unfortunately, no attempt to analyze the significance of these differences was reported.

Taken as a whole, three significant weaknesses were present in the majority of the studies reviewed: (a) confounds in treatment conditions, (b) a lack of subject impairment profiles, and (c) a lack of specific detail in the intervention procedures.

First, treatment confounds were present in several forms: (a) pull-out groups receiving some degree of classroom-based intervention (Valdez & Montgomery, 1997), (b) classroom-based groups receiving some degree of pull-out intervention (Throneburg et al., 2000), and (c) movement of subjects between conditions between testing periods (Bland & Prelock, 1996). While I recognize the limitations presented by the ethical and logistical issues of conducting research with impaired children in a school setting, it was feasible to control for these confounds in all cases,

validity of these procedures. For example, the type of specific therapeutic techniques may have differed between conditions. Alternatively, environmental factors (e.g., visual/auditory distraction) may have impacted the efficacy of a therapeutic technique. As such, this lack of detail impedes the critical analysis of these studies, and undermines the quality of evidence they have produced.

Conclusion

Despite the limited scope and amount of high quality evidence, this critical review found suggestive evidence that classroom-based intervention produces treatment gains comparable to pull-out intervention in children with language impairments.

In light of the weaknesses outlined in the present research, and the overall lack of research addressing this question, additional research is necessary. Future research on this topic should focus on the following:

- The relative treatment gains of subjects with grouped impairment profiles in classroom-based and pull-out conditions.
- The relative treatment gains of subjects with a variety of specific language skills (e.g., Brown's morpheme use, syntax, phonological awareness skills, etc.) in the comparison of the two models.

Clinical Implications

As previously mentioned, the evidence found in this review was limited in both scope and quantity; therefore implications should be interpreted accordingly. When targeting vocabulary in language intervention, the compelling evidence for comparable treatment gains and superior generalization of classroom-based intervention indicate that this approach as the recommended model for evidence-based practice. However, this review has not found sufficient evidence for recommending or discouraging the use of classroom-based intervention over pull-out intervention when targeting other language skills in therapy. Given the reported benefits of both service delivery models (Cirrin et al., 2010), and the current lack of research on this topic, it is reasonable to allow factors other than relative treatment gains to inform the selection of intervention approaches, namely, factors such as time and budget constraints (ASHA, 2002; Boyle et al., 2007), feasibility of successful implementation (Beck & Dennis, 1991; Elksnin & Capilouto, 1994; Law et al., 2002), and theoretically-sound, experience-based clinical judgment.

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