ABSTRACT: This study examines the effects of first versus multiple phoneme instruction with and without prior syllable instruction. 36 pre-kindergartners, randomly assigned to three treatment conditions received 4-6 weeks of 2x/wk treatment in groups of two. Results indicated that preschoolers learned multiple phonemic skills simultaneously and performed significantly better on phonemic measures compared to children who received first phoneme-only instruction. Results also demonstrated preschoolers receiving syllable instruction did not show significance in gain scores compared to children who received multiple phoneme-only instruction.

RATIONALE: Phonological awareness instruction now occurs before kindergarten, but there are still many questions about recommended approaches. Conventional instruction teaches skills to children through a hierarchical phonological progression of large-to-small sound units, ending at first sound. However, it is not established that it is necessary to first teach larger segments of sound or that preschoolers can only achieve first sounds. Two alternate proposals are to teach only at the phoneme level and to introduce multiple phoneme tasks with scaffolding. Teaching only at the phoneme level potentially takes less time and avoids a confusing shift from one sound unit to another. Multiple tasks, taught with differential scaffolding, can provide reciprocal support.

RESEARCH QUESTIONS

Part A
1.) For typically developing preschool children, does training in phonemic awareness alone result in the same or better outcomes than providing syllable training prior to phonemic awareness training?
2.) Will preschool children who receive the additional syllable level phonological awareness training demonstrate confusion when introduced to the phonemic awareness training?

Part B
1.) Will teaching multiple preschool skills in a horizontal scaffolded treatment result in phonemic awareness skills at least as good as teaching first-phonemes alone?
2.) Will teaching multiple preschool skills in a horizontal scaffolded treatment result in better blending and segmenting skills compared to teaching first-phonemes alone?

METHODS

PARTICIPANTS:

In Part A, 12 4-5 year old typical language pre-kindergarten children participated (mean age = 5;5).
In Part B, 24 4-5 year olds participate (mean age = 5;2).

PROCEDURES:

Testing Measures
- Primary outcome measure: Phonological Awareness Test (PAT) syllable segmenting, syllable blending, first phoneme isolation, phoneme blending, and phoneme segmentation
- Language measure: Test of Early Language Development (TELD)
- Clay Letter Name Recognition Screening
- Phonological Awareness Screening

Testing Procedures. PAT administered at pre- and post-testing. Pre-test TELD minimum standard score of 84. Pre-test phonological screening judged as appropriate by investigators. TELD and letter naming used for balancing conditions.

Part A Condition Assignment. Groups balanced on age, general language ability, and letter name knowledge, then randomly assigned to one of two conditions:
1) syllable plus multiple phoneme instruction (SMP)
   - syllable instruction tx 2x/wk for 2 wks, followed by:
     - multiple phoneme instruction tx 2x/wk for 4 wks
2) multiple phoneme-only instruction (MPO)
   - multiple phoneme instruction tx 2x/wk for 4 wks

Instruction
- Sessions 30 minutes in groups of 1-2
- SMP trained on syllable awareness for two weeks prior to the phonemic awareness intervention program.
- For SMP, the first sessions of each week included activities containing at least one blending and segmenting task for the syllable instruction, and at least one first sound, blending, and segmenting task for the phoneme instruction. The second session included a storybook activity involving all activities from first session using only words from the storybook. This session also included an additional blending/segmenting activity. Targets were explicitly and repeatedly taught with systematic scaffolding. Sessions opened and closed with learning objectives.
Part B

Condition Assignment: Same balancing as Part A.
1.) first phoneme only instruction (FPO):
   • first phoneme instruction tx 2x/wk for 4 weeks
2.) multiple phoneme-only instruction (MPO):
   • multiple phoneme instruction tx 2x/wk for 4 weeks

Instruction
All sessions were 30 minutes in groups of 1-2. For FPO and MPO, targets were explicitly and repeatedly taught with systematic scaffolding. Sessions opened and closed with learning objectives.

The first and second session of each week for FPO included activities including at least 3 phoneme activities addressing isolation, generation, matching or an array. Each week, additional phonemes were introduced in an order that facilitated ease of teaching (i.e., easier more visible sounds like /s/ to harder less visible sounds like /j/). The fourth week, a verse book replaced one first sound activity each session and simultaneously addressed isolation, generation, and matching.

The first session of each week for MPO included at least one first phoneme, blending, and segmenting task. The second session of each week included a storybook activity involving all activities addressed in first session of the week using only words from the storybook. This session also included an additional activity addressing segmenting/blending.

RESULTS AND DISCUSSION

Part A

Necessity of Syllable Instruction
For gain scores on the PAT after 4-6 weeks of treatment:
• No significant difference between SMP and MPO conditions, both made large gains, $d = 1.96$ and $d = 1.58$, respectively
• SMP and MPO conditions had similar outcomes measures in individual phonemic tasks

These results suggest that syllable instruction did not impact one individual phonemic awareness task more than another.

Necessity of Syllable Instruction Based on Syllable-Phoneme Confusion
Examined by comparing number of total syllable confusions in treatment sessions:
• SMP group had significantly more confusions than MPO condition, with a very large effect, $d = 2.12$

These results suggest that prior syllable instruction promotes syllable confusion in children in early phonemic instruction.

Part B

Effects of horizontal scaffolded instruction on first phoneme knowledge?
Gain scores on the PAT after 4 weeks of treatment:
• No significant difference between MPO and FPO, both made very large gains, $d = 2$ and $d = 1.52$, respectively

These results suggest that preschoolers can learn first phoneme identification at least as good as preschoolers learning in a vertical single skill approach.

Effects of horizontal scaffolded instruction on blending and segmenting?
Gain scores on individual subtests of the PAT after 4 weeks of treatment:
• Significant gain in first phoneme, blending, and segmenting for MPO with large effects, $d = 2.34$; $d = 1.43$, respectively
• Significant gain in first phoneme for FPO: $d = 1.52$
• No significant gain in blending or segmenting for FPO: $d = 1.02, d = 0.08$.

Gain scores for partial score on PAT after 4 weeks of treatment:
• Significant gain in partial segmentation for MPO: $d = 1.52$
• No significant gain in partial segmentation for FPO: $d = 0.96$
  (Bonferroni correction, $p = 0.16$)

These results suggest that preschoolers can learn blending and segmenting skills in a horizontal multiple skill approach at least as good as preschoolers learning in a vertical single skill approach.

CONCLUSION: This study demonstrated that a shorter training period without syllables has the same gains as syllable plus phoneme intervention, and that syllable confusion was present when children shifted from syllable to phoneme instruction. This suggests that syllable instruction is unnecessary to teach children. This study also showed that preschoolers can make large gains in multiple phonemic skills simultaneously with systematic support in a 4-week period. Results suggest that knowledge of multiple phoneme skills facilitates better learning of other phonemic skills. For example, first phonemes, blending, and segmenting can all be targeted in one activity, providing multiple opportunities for each skill and greater knowledge in one skill can support the learning of another skill.