

***The Effectiveness of the Zoo-phonics Multisensory  
Language Arts Program for Preschool and Kindergarten  
Children in California, Kentucky, and Oklahoma Schools  
4 Studies  
(Plus Gender Studies)***

***2014 - 2016***

*Study One: Three-year-old Students' Alphabetic Knowledge*

*Study Two: Four-year-old Students' Alphabetic Knowledge - Half-Day Program*

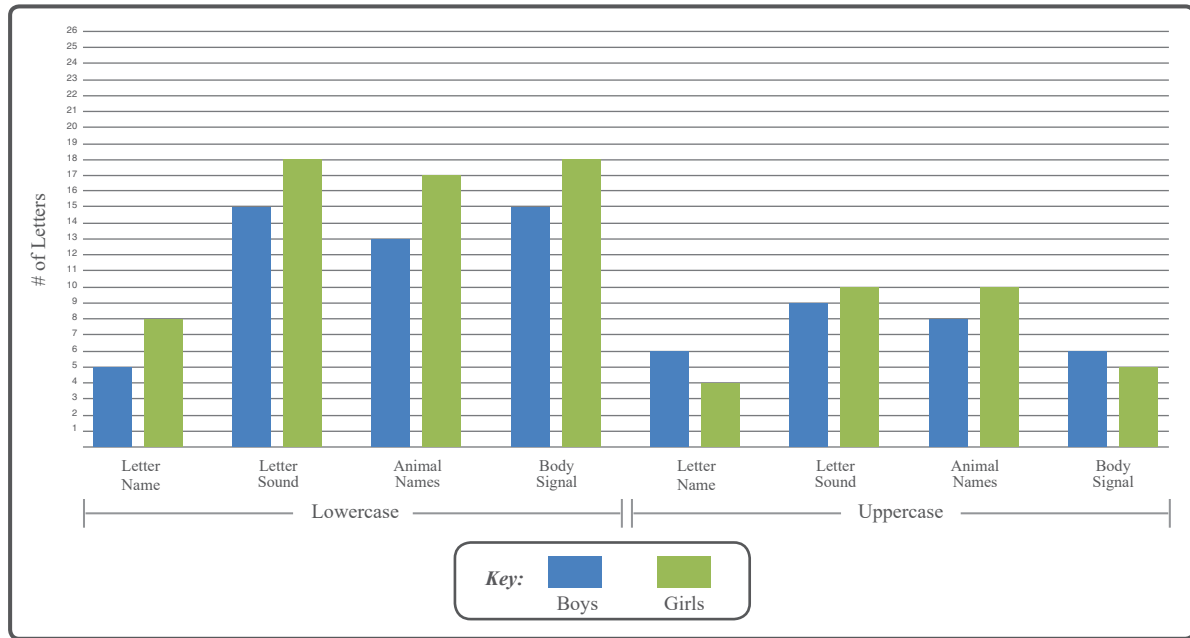
*Study Three: Four-year-old Students' Alphabetic Knowledge - Full-Day*

*Study Four: Kindergarten Students' Alphabetic Knowledge – First Trimester*



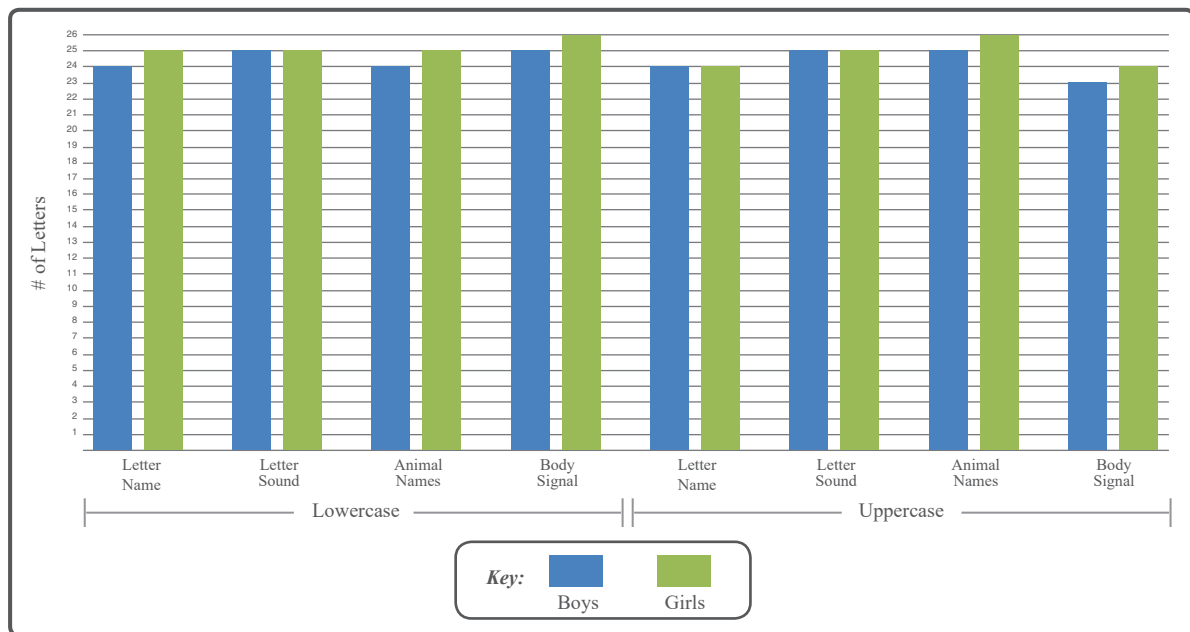
**An Independent Study Conducted by E3 Research**

## Zoo-phonics and Gender Issues



**Figure 1. Three-Year-Old Head Start Boys and Girls.** This graph shows lower- and uppercase alphabetic proficiency for four measures at the end of the year, for two school years.

Mean scores show that three-year-old girls slightly outperformed boys by an average of 3.5 (3.4%) letters across all four variables measured in the study. Lowercase shapes, sounds, Zoo-phonics Alliterative Animal Names and Body Signals were stressed, rather than letter names and uppercase letters for children at this age. The *Zoo-phonics* ' philosophy believes in teaching the most important alphabet skills first and not overloading young children with too much information at one time. All of the variables measured are predicated on recognizing the shape of the lowercase letters. The result is a high correlation among letter shapes, sounds, Alliterative Animal Names and Body Signals.



**Figure 2. Four-Year-Old Head Start/Preschool - Boys and Girls - Alphabetic Proficiency.** This graphs shows year-end alphabetic proficiency using four lower-and uppercase measures for two school years.

Four-year-old Head Start/Preschool students demonstrated that the trends of girls performing better than boys is nearly **eliminated** with less than one letter difference in lowercase and one letter difference across the uppercase variables. Boys and girls effectively performed equally by the end of the year. Upper- and lowercase alphabets, including letter names, were taught, and near-mastery was achieved for almost all students.

# Abstract

To determine the effectiveness of the *Zoo-phonics Multisensory Language Arts Program* for all students, preschool and kindergarten students in this study were taught lower- and uppercase alphabets (shapes, names, and sounds) through the *Zoo-phonics Program* for children in multi-ethnic, low income school environments.

A multiple cohort design was used to measure alphabetic proficiency gains in four educational settings during the 2014-2016 school years: preschool (3-year-olds – half-day programs, 4-year-olds – half- and full-day programs) and kindergarten. Each of the settings included a significant number of students from low SES demographics as demonstrated by participating in the “free and reduced” meals program. The four cohorts were comprised of 1,619 three- and four-year-old preschoolers and kindergarten students in three school districts in Kentucky, Oklahoma and California.

Overall findings showed that regardless of gender, low income, nor multi-ethnic demographics, demographics did not have a negative effect on the alphabetic knowledge of these children.

The three **mnemonic devices** (animal/letter alphabets, alliterative animal names, and physical movement for each letter) are at the core of Zoo-phonics. Data demonstrated that kindergarten males and females performed equally, leading us to conclude that the overall poor reading performance of our nation’s students can be effectively addressed by beginning the reading and writing process using a multisensory approach such as Zoo-phonics.

Because of the playful, veristic, physical and academically well-rounded nature of the Zoo-phonics curriculum and methodology, it appears to meet the cultural needs of all children, especially boys, who may need more communal, oral, physical and musical expression and verve.

---

## Program Description

The *Zoo-phonics Multisensory Language Arts Program* is a developmental, sequential and comprehensive, phonics- and literature-based language arts program for early and primary education: toddlers, preschoolers, kindergarten and first grade, inclusive of Special Education students and English Language Learners.

Zoo-phonics uses three different sets of mnemonics as triggers for memory. 1) **Pictorial Mnemonics:** Children first learn through the *Lowercase Animal Alphabet*, where animals are drawn directly into the shape of each lowercase letter (Ehri, 1984). 2) **Auditory Mnemonics:** Each Animal Letter has an alliterative name that helps children master the sounds of the letters. 3) **Physical Mnemonics:** animal-related movements, called Body Signals, are given to each Animal Letter, connecting the shapes and sounds of each lowercase letter into long-term memory. According to Ratey (2014),

“Big brains and intricate physical movement go together . . . . Movement places demands on the brain,

just as it does on muscle, and so the brain releases BDNF (Brain-derived neuro-trophic factor), which triggers the growth of cells to meet the demands of increased mental demands of movement. BDNF floods throughout the brain, not just to the parts engaged in movement...the whole brain flourishes as a result of movement. It provides the environment that brain cells need to grow and function well.”

The *Uppercase Animal Alphabet* uses the same *Animals* as the lowercase alphabet, providing an **associative affect** for easy mastery. These playful, physical and novel mnemonics transform abstract symbolism into concrete letter shape and sound information for both alphabets. Because of the physicality, playfulness and veristic methodology (Boykin, 2001), all students have access to learning, including special needs and English Language Learners. Research demonstrates that it decreases achievement gaps in learning for ethnic and low income groups and between genders (Griffith, 2016). Zoo-phonics provides a socially engaging environment where

children interact with both teachers and classmates in a positive and playful manner.

Once the alphabet is mastered, initial, ending and medial sounds are taught. These letters can then be strung together to form simple vowel-consonant (VC) and consonant-vowel-consonant (CVC) words. Children are taught to segment, blend, and rhyme at this time. Children continue to use their bodies to Signal out the sounds in words, inputting new information into long-term memory. Soon, more complex phonetic concepts are sequentially taught

(the schwa sound, double consonants, blends, digraphs, long vowels, r controlled vowels, diphthongs, silent letters and soft sounds) still using the Body Signals, until mastery and independence is achieved.

Zoo-phonics is so much more than an alphabet or phonics program. Zoo-phonics teaches children to “closely” read through decodable readers as well as through literature. Children learn to write as they successfully learn to read and spell. Grammar, capitalization, punctuation and critical thinking skills are taught daily.

# Study One: Three-Year-Old Head Start Students' Alphabetic Knowledge Participants

Cohort #1 was comprised of 108 Head Start three-year-olds. The cohort consisted of two groups, one in 2014-2015 and the second in 2015-2016 school years. All enrolled students participated in the study regardless of ability or language. All students attended the half-day Audubon Head Start/Preschool in Ohio County School District, Hartford, Kentucky. Because many children in the Head Start/Preschool Program live in rural areas, many did not attend their schools with regularity.

## **Assessment and Methodology:**

The assessment instrument used in these studies was the *Zoo-phonics Beginning Reading Assessment, Version 3 (Z-BRA3)*. All students were assessed in the first two weeks of school, at mid-term in January, and at the end of the school year, in late May. The data were analyzed using Paired Samples T-tests with a p-value set at  $p \leq 0.05$ .

Children were asked to identify the letters by letter name, letter sound, the Zoo-phonics Alliterative Animal Names and Body Signals.

The January assessment was used to test the hypothesis that students using the *Zoo-phonics Multisensory Language Arts Program* learn the sounds and shapes of the lowercase alphabet within the school year of pre-school and are near mastery during this period.

Uppercase letters are not taught to this age-group, but some 3-year-olds did recognize commonalities between lower- and uppercase letters. Also, three- and four-year-olds share the same classes, leading to naturally occurring but unintentional learning of uppercase knowledge by three-year-olds. Parents may teach these skills to their children.

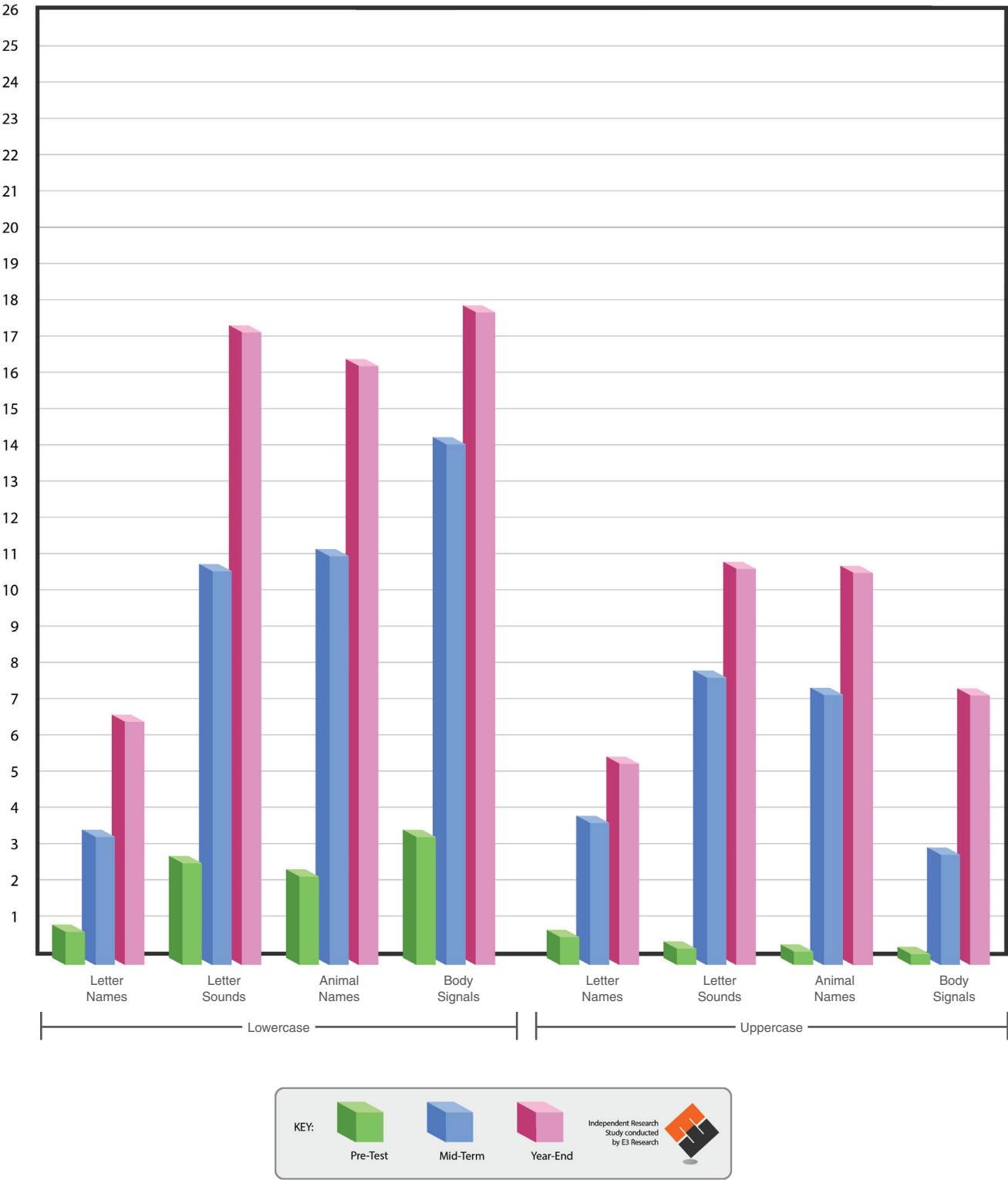
Teachers in the study were state-certified to teach preschool and were trained in the methodology and curriculum used in the *Zoo-phonics Program*. At the outset of this study, teachers, aides, and principals agreed to use the *Zoo-phonics Multisensory Language Arts Program* with fidelity.

## **Findings:**

Three-year-olds were initially taught lowercase letter shapes and sounds through the Lowercase Animal Alphabet Cards, Alliterative Animal Names and Body Signals. Capital letters and letter names are not emphasized in the *Zoo-phonics Program* for this age group. Letter names are not taught until the sounds of the letters are fully mastered. When letter names are pronounced, they also make sounds which are different than the sounds of the letters, and may interfere with learning the sounds of the letters if taught at the same time. As evidenced by Figure 1, lowercase letter sounds, Alliterative Animal Names and Body Signals were learned at essentially the same levels. Each skill shows significant growth between the pre-test and the mid-term assessment in January. Most growth over the year happened in that time period. Children continued to develop alphabet skills as seen in the post-test. Uppercase alphabetic learning was a collateral function of attending the class with four-year-olds and the home environment.

The data demonstrated that whenever the three-year-olds saw the *Zoo-phonics Merged Animal Letter Cards*, they had strong recall of the shapes and sounds of the letters, could recall the Alliterative Animal Names and the animal-related Body Signals for each letter with proficiency. It also showed that usage of the Animal Letters, the Alliterative Animal Names, and Body Signals helped them to remember less emphasized alphabet information, such as letter names and capital letters, because the children made associations with the Zoo-phonics Animal Letters. Although not assessed at this time, three-year-olds also were able to identify the initial letter sounds in names and object words and could transfer this skill to their own names and environment.

Graph 1 – Alphabetic Knowledge of Three-Year-Old Head Start/Preschool Students



Three-year-olds made significant lowercase gains in each trimester, making the strongest gains mid-year (January). Children continued to make progress as demonstrated by post-test scores. In the Zoo-phonics curriculum, capital letters and letter names were not taught to this age group, and gains in this area were expected to be delayed. However, uppercase alphabetic learning was a collateral function of attending the class with four-year-olds.

# Study Two: Four-Year-Old Head Start Students’ Alphabetic Knowledge Through Zoo-phonics (Half-Day Program Participants)

Cohort #2 is comprised of 217 four-year-old preschoolers who attended the Audubon Head Start/Preschool Program in Ohio County School District, Hartford, Kentucky. Students attended half-day classes between two and five days a week and attended the Head Start/Preschool Program during the 2014-2015 and 2015-2016 school years. Because many children in this Head Start Program live in rural areas, many did not attend their schools with regularity. The demographic mix included a majority of students of Caucasian descent, in the low-socio-economic range (SES). This study also included a number of Hispanic children from low-income families who self-identify as English speakers.

## **Methodology:**

This cohort consisted of one group assessed in 2014-2015 and the second group assessed in 2015-2016. Prior to introducing the *Zoo-phonics Multisensory Language Arts Program* to the students, teachers conducted the pre-test during the first two weeks of school (September). Additional assessments were conducted at mid-term in January and at the end of the school year in late May. The Zoo-phonics Basic Reading Assessment, Version 3 (*Z-BRA 3*) test instrument was used to assess alphabetic knowledge of lower- and uppercase letters (letter shapes, names, and sounds, Alliterative Animal Names and Body Signals). All students enrolled in the Head Start/Preschool Program were included in the study.

The January assessment was used to test the hypothesis that students using the *Zoo-phonics Multisensory Language Arts Program* learn most of the lowercase alphabet within the first trimester of preschool and reach mastery by the end of the school term.

Teachers in the study were state-certified to teach preschool and were trained in the methodology and curriculum used in the *Zoo-phonics Program*. At the outset of this study, teachers, aides, and principals agreed to use the *Zoo-phonics Multisensory Language Arts Program* with fidelity.

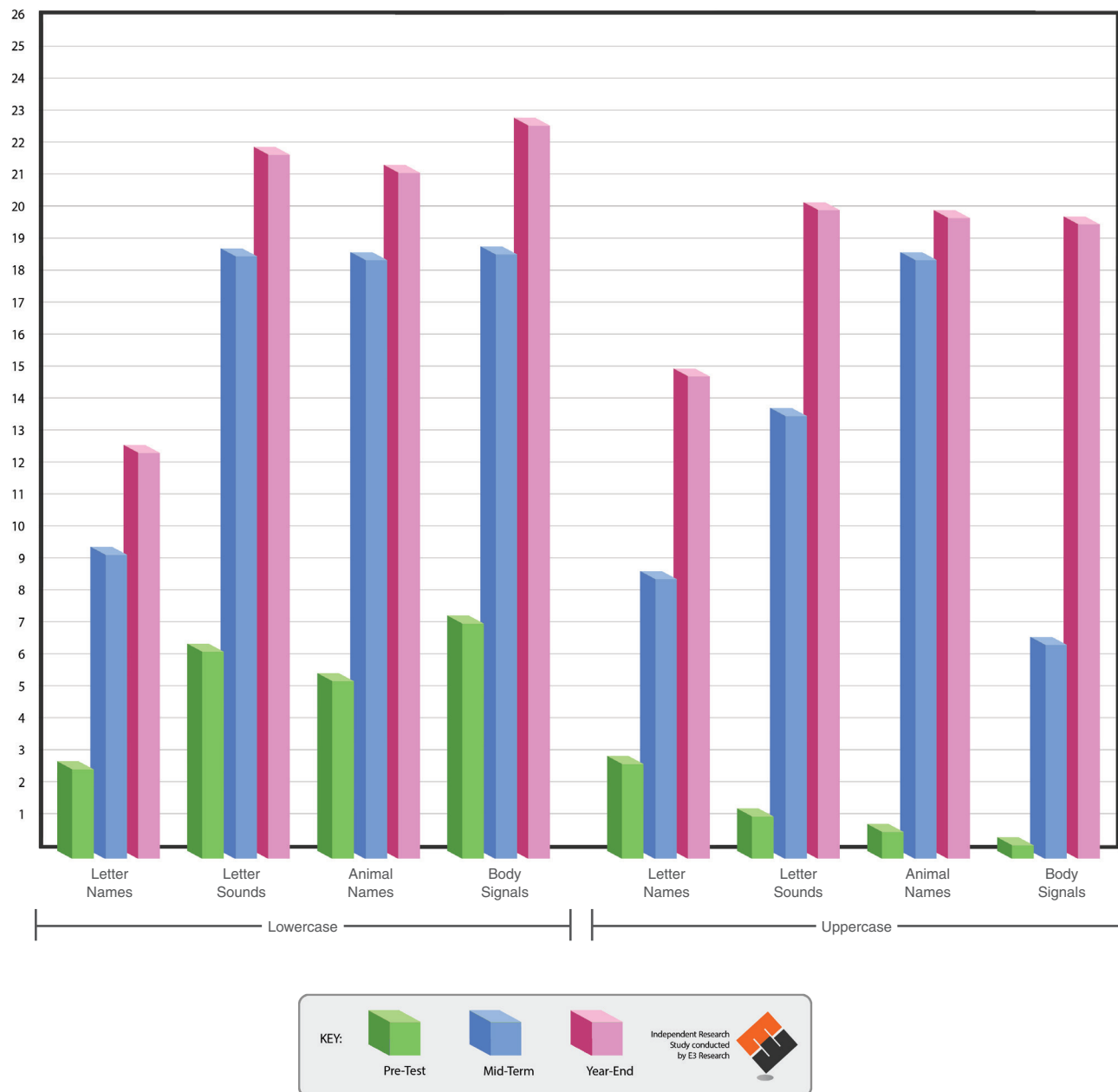
## **Findings:**

A general pattern emerged showing consistent growth initially in lowercase letter names, sounds, Alliterative Animal Names and Body Signals, and, later, in uppercase information. The mean scores for lowercase letter sounds, Alliterative Animal Names and Body Signals showed a significant increase of about 14 letters by the end of the school year. Letter names also showed a significant increase of about 10 letters, even though they are not emphasized.

In *Zoo-phonics*, lowercase letter sounds and shapes were stressed over letter names leading to positive proficiency differences. The uppercase alphabet was introduced subsequent to mastery of the lowercase alphabet. Whereas significant growth in uppercase knowledge was made, it was not complete. It appears that not all teachers tested children on the Zoo-phonics Capital Letter Signal. The findings in Figure 2 represent mean scores for two years.

The 2015-2016 school term scores were notably stronger because of improved teacher proficiency and the large inclusion of students who received Zoo-phonics as three-year-olds in their preschool and Head Start Program.

**Graph 2 – Four-Year-Old Head Start/Preschool Students’ (Half-Day Program) Alphabetic Proficiency**



Strong increases in proficiency levels indicated significant growth in both lowercase and uppercase letters, sounds, Alliterative Animal Names and Body Signals during each trimester, with the mid-term (January) showing the greatest gains.

The half-day preschool students in this study showed strong growth in the alphabetic domain, demonstrating that the letter shapes and sounds of the lowercase alphabet can be learned easily and quickly, even in a half-day program. Strong associations among letter sounds, Alliterative Animal Names and Body Signals provided a consistent base for rapid recall and strategies for early reading without a total reliance on letter name-sound memorization, as is taught in other programs. The Uppercase Letter Body Signal, used to designate and reinforce capital letters, was under-reported by some teachers. A slightly lower reported mean score for this group was the result. Acquiring this alphabetic knowledge prepared preschool children for more advance academic concepts earlier. These concepts included initial, ending and medial sounds, rhyming, sound segmenting and blending, reading of words, and word building, although not assessed at this time.



# Study Three: Four-Year-Old Students’ Alphabetic Knowledge Through Zoo-phonics (Full-Day Participants)

Cohort #3 was comprised of 179 four-year-old preschoolers who attended one of four district-operated preschool programs in the Putnam City School District, Oklahoma City, Oklahoma during the 2015-2016 school year. The majority of the students were identified as having a low socio-economic status. Students in this cohort attended full-day classes daily. The ethnic demographics were mixed, with 40% Caucasian, 27% Black, 22% Hispanic, 7% Native American, and 4% Asian.

## **Methodology:**

The *Zoo-phonics Multisensory Language Arts Program* was used to teach lower- and uppercase alphabets during the 2015-2016 school year. Cohort #3 was assessed in the fall during the first two weeks of class, at the end of November, and in the spring. The mid-November assessment was used to test the hypothesis that students using the *Zoo-phonics Multisensory Language Arts Program* learn and lower- and uppercase alphabets within the first trimester of preschool and reach mastery by the end of the school term.

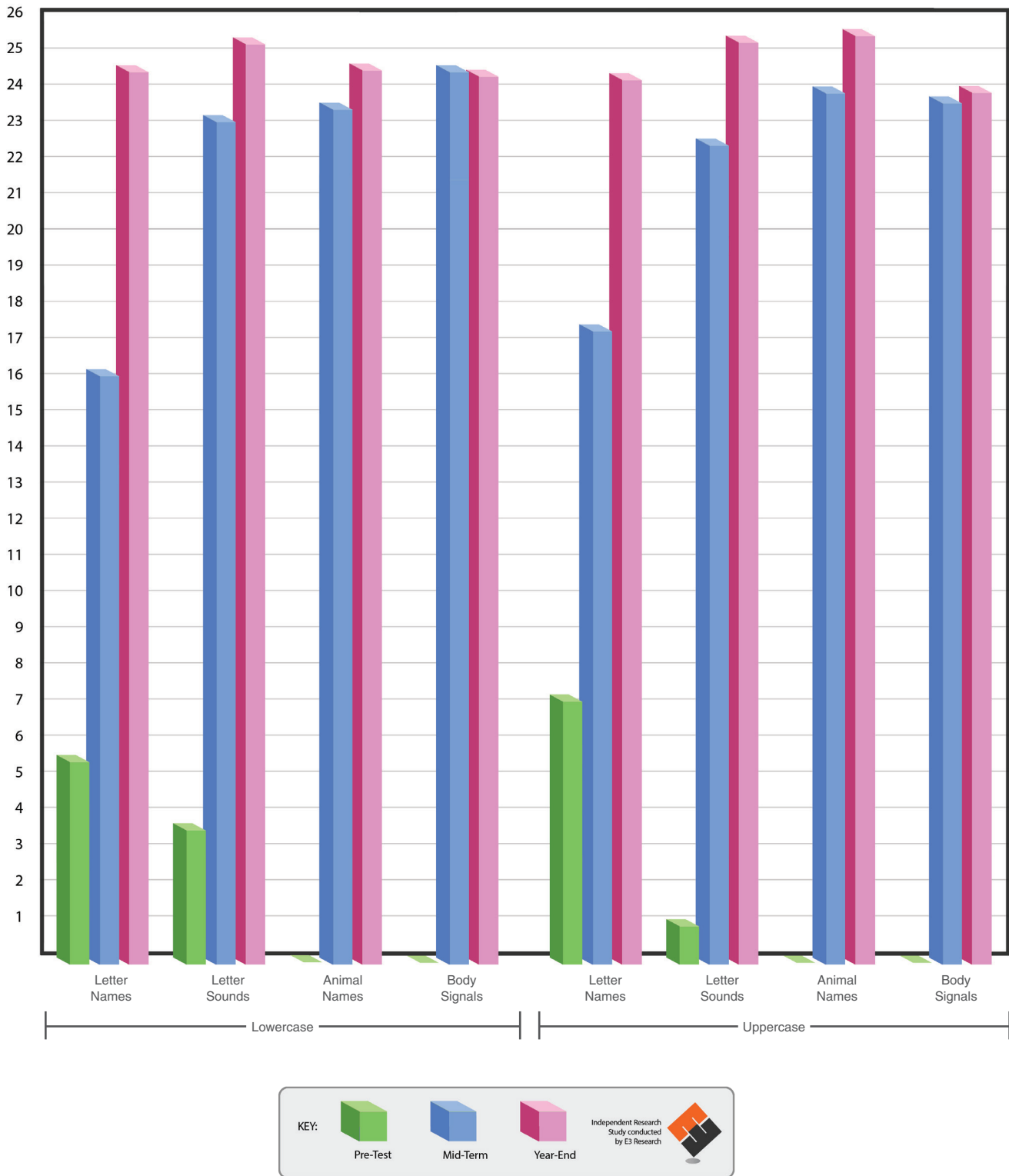
The alphabetic portion of the *Z-BRA3* test instrument was used to assess alphabetic knowledge of lower- and uppercase letters (letter shapes, names, and sounds, Alliterative Animal Names and Body Signals).

Teachers in the study were credentialed to teach in Oklahoma and were trained in the methodology and curriculum used in the *Zoo-phonics Program*. Prior to the commencement of the study, teachers, aides, and principals agreed to use the *Zoo-phonics Multisensory Language Arts Program* with fidelity.

## **Findings:**

A significant pattern emerged showing consistent growth in both lower- and uppercase letter names, sounds, Alliterative Animal Names and Body Signals. The mean scores for lowercase letters were 24 letters in one measure and 25 in the remaining three measures. Similarly, uppercase letters ranged between 23 and 25 in each measure. Letter sounds were stressed over letter names leading to the positive proficiency differences. The uppercase alphabet and letter names are taught later in the year after lowercase information is mastered. At the beginning of the year, Alliterative Animal Names and Body Signals were reported as zero because these students had no prior exposure to Zoo-phonics methodology. In both lowercase and uppercase alphabets, near mastery was evident for this cohort at the mid-term (November). From this point on, children continued to gain alphabet knowledge and were able to use it in daily word play.

**Graph 3 – Four-Year-Old (Full Day Program) Alphabetic Proficiency**



This cohort began the school year with no exposure to Zoo-phonics. By the end of the first trimester (November), mean scores indicated near mastery of lowercase and uppercase alphabetic components. This knowledge allowed this age group to use the letters in locating initial, ending, medial sounds, segmenting and sound blending, and word building.

# Study Four: Kindergarten Students’ Alphabetic Knowledge Through Zoo-phonics (First Trimester Assessment Participants)

The Kindergarten Cohort group was comprised of 1,115 kindergarten students from Quail Valley Elementary, Menifee, California, Goldenrod Elementary, Kerman, California, Alta Vista Community Charter, Auburn, California, Ohio County School District, Hartford, Kentucky and the Putnam City School District, Oklahoma City, Oklahoma. The composition of districts provided a diverse ethnic mix of Caucasian, Black, Hispanic, Asian, and Native American students as well as inclusion of a large number of second language learners. The majority of students in this study participated in Free or Reduced-cost Meal Programs, indicating low socio-economic status.

## **Methodology:**

This cohort included students from the 2014-2015 and 2015-2016 school years. Students were not duplicated in multiple cohorts. The *Z-BRA3* test instrument was used to assess alphabetic knowledge of lower- and uppercase letters (letter shapes, names, and sounds, Alliterative Animal Names and Body Signals).

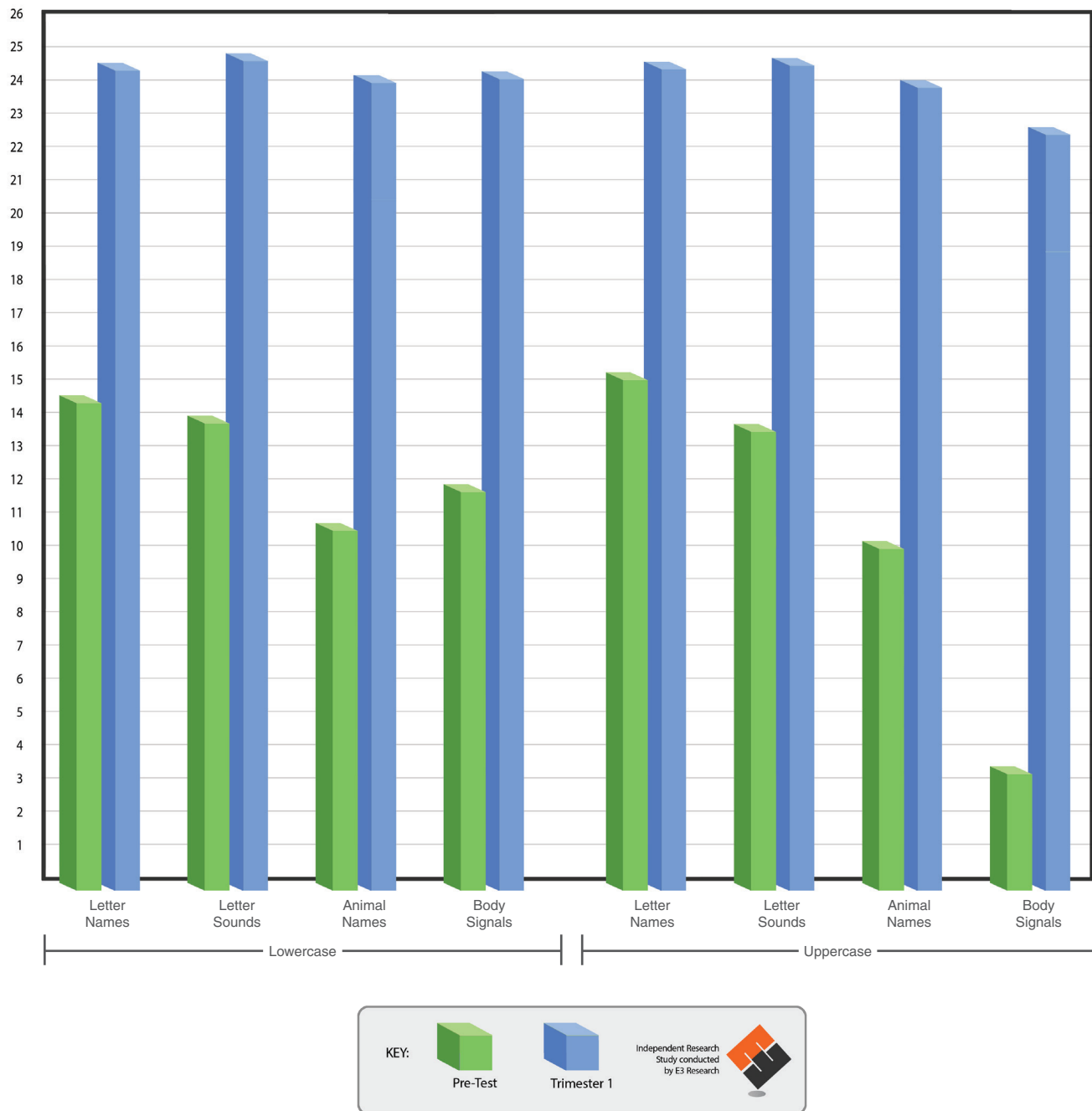
Teachers in the study were credentialed to teach in their home state and were trained in the methodology and curriculum of the *Zoo-phonics Multisensory Language Arts Program*. At the outset of this study, teachers, aides, and principals agreed to use the *Zoo-phonics Program* with fidelity.

Data were collected during the first two weeks of school and at the end of the first trimester in November. The mid-November assessment was used to test the hypothesis that students using the *Zoo-phonics Multisensory Language Arts Program* learn and lower- and uppercase alphabets within the first trimester of kindergarten and reach mastery during this period.

## **Findings:**

A general pattern emerged showing consistent and significant growth in lower- and uppercase letter shapes, names, sounds, Alliterative Animal Names and Body Signals. The mean scores for upper- and lowercase measures were about 24 letters in each category with the exception of nearly 22 uppercase Signals. There is an ancillary Body Signal that designates and reinforces capital letters. This score may be under-reported because teachers may have not taught it, or teachers may have not tested for the ancillary Body Signal.

**Graph 4 – Kindergarten Alphabetic Proficiency. A Comparison of  
Pre-test and Post-test Alphabetic Scores for 1,115 Kindergarten Students**



Graph 4 indicates that many students arrived in kindergarten knowing at least some of the alphabet and many had earlier exposure to *Zoo-phonics* in Head Start/preschool or through contact with older siblings. By the end of the first trimester, mean scores on all measures indicated significant growth and proficiency levels, approaching mastery in both lower- and uppercase alphabets. High achievement in letter name recognition and sound knowledge are preparatory to early reading while strong skills in the Lowercase Animal Alphabet, Alliterative Animal Names, and Body Signals gave students key learning strategies for sound blending, segmenting, reading, spelling and writing words. Notably, students from all demographic groups and starting points achieved high levels of proficiency, indicating that the *Zoo-phonics Multisensory Language Arts Program* is an effective language arts approach for all students.

## Conclusions

The **three mnemonics** (the lower- and uppercase Animal Alphabets, the Alliterative Animal Names and Body Signals) cement the shapes and sounds of the letters for both the lower- and uppercase alphabets and are used for spelling, reading and phonics skills development. The playful, physical, vivid, novel, and concrete curriculum reduce risk, create camaraderie, increase attention, stimulate cognitive awareness, establish memory, and motivate children to keep learning. As seen in the data, three-year-old children were able to address sounds to shapes of the lowercase letters, and to identify initial, ending and medial sounds in words. Four-year-old children were able to master lower- and uppercase alphabetic information, which enabled them to begin to locate initial, ending and medial sounds, rhyme, segment and sound blend, read, and word build.

As the *Zoo-phonics* reading, spelling and writing curriculum becomes more complex throughout the year, students continue to use the Merged Animal Alphabet and Body Signals as a scaffolding strategy and a memory-trigger. These skills are then transferred to other academic subjects.

This study of 1,619 students included male and female preschool and kindergarten children from low SES environments, multi-ethnic groups, and was inclusive of special education children, non- to limited-English Language Learners, and those needing additional educational support. The data shows that there is strong evidence that students of all ages, stages, abilities, and demographics can develop solid early literacy skills which will establish the foundation to support children throughout their school careers. It is hoped that this study stimulates a discussion with other researchers and educators, and hopefully more studies on the efficacy of the *Zoo-phonics Multisensory Language Arts Program* for young children will ensue.

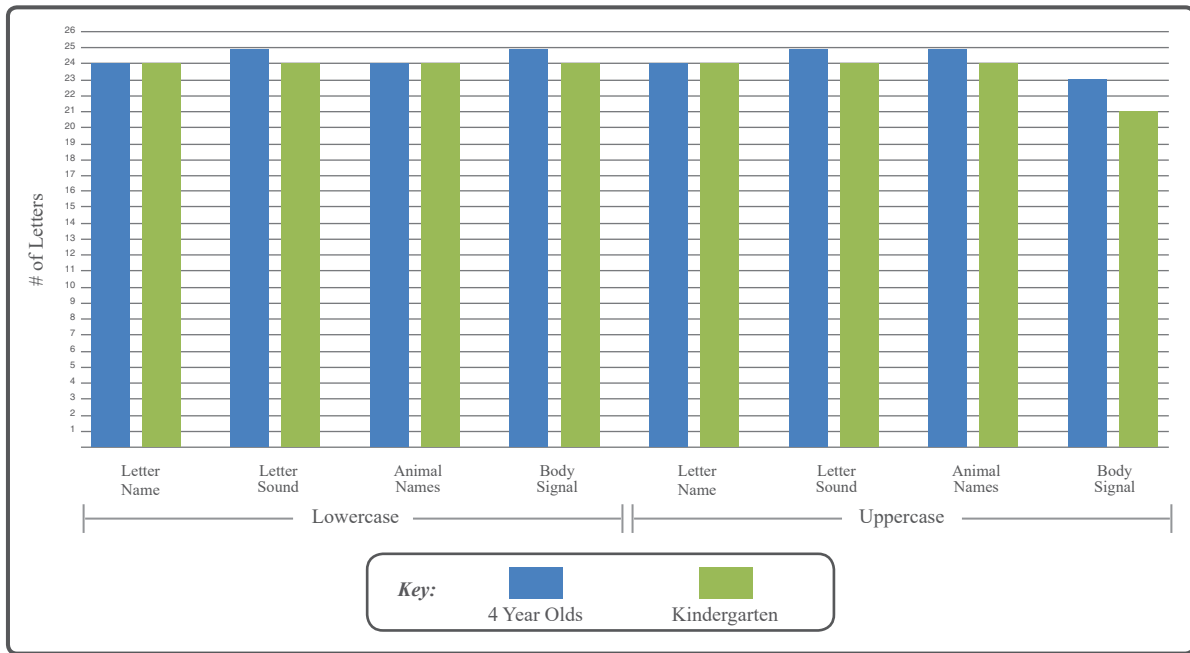
---

## References

- Boykin, W. & Cunningham, R. (2004). Enhancing cognitive performance in African American children through multiple contexts: Infusing Afro-cultural ethos. In R. Jones (Ed.), *Black psychology* (4th Ed.). Hampton, VA: Cobb and Henry.
- Ehri, L., Deffner, N. Wilce, L. (1984). *Pictorial mnemonics for phonics*, Journal of educational psychology, 1984 - psycnet.apa.org.
- Ehri, L (2005). *Learning to read words: Theory, findings, and issues*. Scientific Studies of Reading, ERIC <http://eric.ed.gov/?id=EJ683147>.
- Griffith, S. (2016). *The efficacy of the Zoo-phonics multisensory language arts program, 6 studies*, Sacramento, CA: E3 Research.
- Ratey, J. & Manning, R. (2014). *Go Wild*, Little, Brown, and Co., NY.

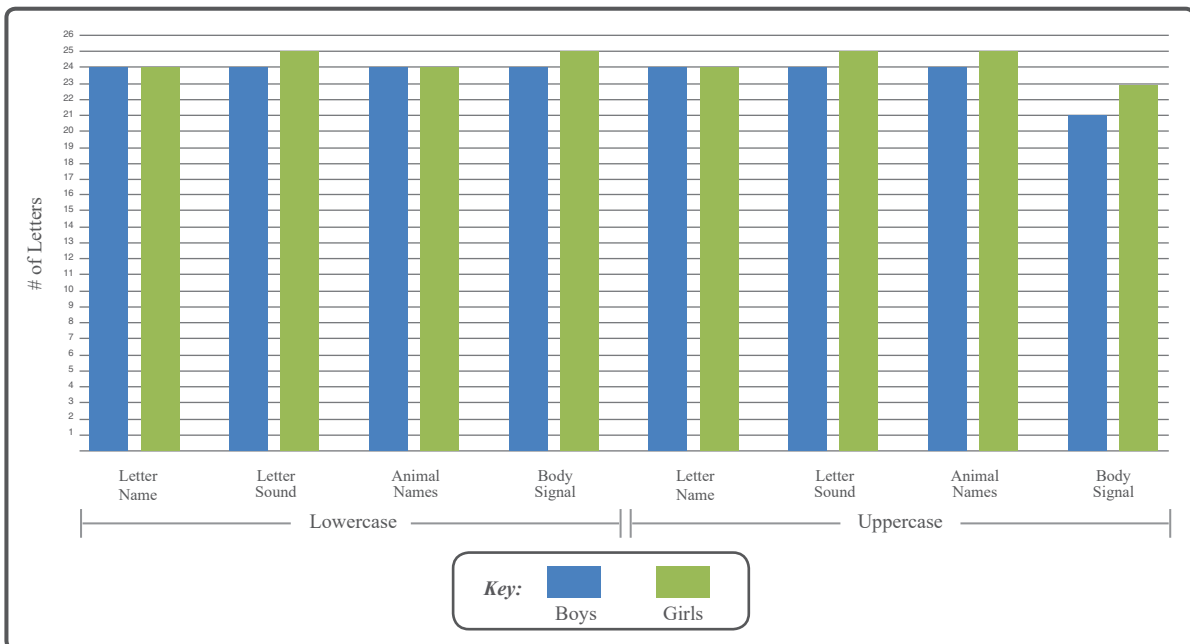


## The Efficacy of Zoo-phonics with Boys and Girls



**Figure 3. Four-Year-Old Head Start/Preschool Boys' and Kindergartners' Comparisons.** This graph compares the relative year-end proficiency levels of boys in full-day preschool programs with the first trimester scores of kindergartners in a two year study.

**Boys.** Four-year-old Head Start boys were compared with kindergarten boys in their first trimester of school. Interestingly, the four-year-old cohort slightly outperformed their older counterparts. One key factor was that the four-year-olds received *Zoo-phonics* for an entire school year, while the kindergarten students were assessed at the end of the first trimester (in November). Additionally, the analysis included all students in each cohort without regard to previous alphabetic learning, demographics or individual learning needs.



**Figure 4. Kindergarten - Boys and Girls - Alphabetic Proficiency.** This graphs shows year-end alphabetic proficiency using four lower- and uppercase measures in the first-trimester of school in a two year study.

In the first-trimester (November) of the kindergarten, the differences in alphabetic performance between boys and girls were minimal. Less than one letter separates the two groups across all measures. Additionally, since all students in the study population were included, a case can also be made that by the end of the first trimester in kindergarten, all students, no matter what their gender, SES, ethnic background or other demographic characteristics, quickly learned the alphabet through the *Zoo-phonics Multisensory Language Arts Program*.



**An Independent Study Conducted by E3 Research**

[www.e3research.com](http://www.e3research.com)

Tel: 916.956.8556

[www.zoo-phonics.com](http://www.zoo-phonics.com)

Zoo-phonics, Inc. - 995 Morning Star Dr, Ste B, Sonoma, CA 95370 - Tel: 1.800.622.8104  
07-041117