# Oregon Kindergarten Assessment
# Fall 2017

***Assessment results of***
***Deaf & Hard of Hearing Kindergarten students***
***compared with the***
***Not Deaf & Hard of Hearing Kindergarten students***

**Oregon Department of Education**

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***Results comparing Deaf & Hard of Hearing Kindergarten students to other Kindergarteners***

**Intro:**

The Fall 2017, Oregon Kindergarten Assessment (KA) was administered statewide to approximately 41 thousand children entering Kindergarten.

This assessment looks at the entering students social/behavioral, early math, and early literacy abilities:

- Students Learning Behavior (Approaches To Learning: Self-Regulation and Interpersonal Skills)
- Early Mathematics (one test)
- Early Literacy (three tests; English Letters Name and Sound Recognition)

The Oregon School for the Deaf (OSD), asked the Oregon Department of Education (ODE) to compare the KA test results of students identified as 'Deaf & Hard of Hearing' (D&HH) (also referenced here as the 'focal' group), with the non-D&HH students (also referenced here as the 'referent' group).

The comparison was based on observed intergroup score differences (in mode, median, mean, std. deviation and the 25% to 75% interquartile range.) There was no analysis done to examine or identify the 'Why' socio-economic or instructional factors that could speak to the score differences. Obviously such additional information would be a necessary component for developing performance gap mitigation strategies.

## Overall

The 2017 Kindergarten Assessments show a performance difference between the focal and referent group. The differences favor the referent group. In most cases, these differences are '**statistically'** significant. A cursory look showed no geographic correlation to the D&HH group scores, that is to say no regional differences were observed. Additionally, there was no significant change in the D&HH 2017 results relative to the D&HH 2016 performance.

Caution is advised when assigning '**practical'** significance to the differences, given that:

- D&HH group size was very small compared to the full kindergarten population (63 vs 40+ thousand, which is less than one-fifth of one percent). Small group sizes mitigate confidence in generalizing to a larger or future D&HH population.
- Quantitative differences have not been qualified/aligned/normalized to any future outcomes. In other words, present or future effect of these score difference in any of the assessments is currently undetermined.

## Demographic differences:

Demographically speaking, Whites comprise roughly 63% in both groups, however the D&HH group has a slightly higher proportion of Hispanics, approximately 32% vs. approximately 23% in the referent group.

The gender ratio for the D&HH group was 37% female, 63% male. The referent group was more balanced with approximately 48.5% females, 51.5% males.

## Assessment score differences:

**Approaches To Learning:** No practical difference observed between the focal and referent groups. But unlike the referent group, within the D&HH group females scored significantly higher than males.

**Early Mathematics**: Compared to the referent group, D&HH students received lower scores on the average. Within the D&HH group, Hispanics, Whites, males and females, all preformed similarly. In the main group, Hispanic students received lowers scores compared to Whites, males, and females. Note that some students can belong to multiple categories, e.g. Female Hispanic students.

**Early Literacy:**

**Upper and Lowercase English Letter Name Recognition:** Though 'average' scores were less for the D&HH group compared to the main group, both groups had wide range of scores (25% to 75% interquartile range). Within the D&HH group, the Hispanic students scored the lowest followed by female students.

**English Letter Sounds Recognition:** This test requires the students to vocalize their response. D&HH students may or may not be able to vocalize their responses. Score comparisons are not advised for this test.

**Year-to-Year Test differences:**

Early Mathematics 2017 scores cannot be compared to 2016 scores. Several test items were changed or replaced from the prior year. Statewide, there was a noticeable increase in the scores due to some harder mathematic items being replace with some simpler items.

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**Document Contents:**

The attached table and charts show the aggregate KA scores for the D&HH and main groups.
Additional breakouts for Hispanics and Whites, females and males are included.

The numerical results are presented in 10 side-by-side tables

| | D&HH KA students | Other KA students |
|---|---|---|
| • ALL | **Table 1** | **Table 2** |
| • *Hispanic* | **3** | **4** |
| • *White* | **5** | **6** |
| • *Female* | **7** | **8** |
| • *Male* | **9** | **10** |

This is the **Table 1** referenced above. It shows the aggregate statistics for the D&HH subgroup for the three Kindergarten Assessment domains.

| | Deaf & Hard of Hearing KA students | | | | | |
|---|---|---|---|---|---|---|
| **ALL** | N | Mean | Median | Mode | St. Dev | Qrtiles (25\|50\|75) |
| *Approaches To Learning : Total (1-5)* | 63 | 3.4 | 3.3 | 4.0 | 0.8 | ( 2.8 \| 3.3 \| 4.0 ) |
| *Approaches To Learning : Self-Regulation (1-5)* | 63 | 3.3 | 3.1 | 3.0 | 0.9 | ( 2.7 \| 3.1 \| 4.0 ) |
| *Approaches To Learning : Interpersonal Skills (1-5)* | 63 | 3.7 | 3.8 | 4.0 | 0.8 | ( 3.0 \| 3.8 \| 4.2 ) |
| | | | | | | |
| *Early Mathematics (0-16)* | 61 | 9.5 | 9.0 | 7.0 | 3.9 | ( 7.0 \|9.0 \|12.0 ) |
| | | | | | | |
| *Early Literacy: UC Letter Name Recog (0-26)* | 62 | 12.3 | 11.0 | 26.0 | 9.8 | ( 3.0 \| 11.0 \| 22.0 ) |
| *Early Literacy: LC Letter Name Recog (0-26)* | 62 | 10.1 | 8.0 | 0.0 | 9.1 | ( 2.0 \| 8.0 \| 19.0 ) |
| *Early Literacy: Letter Sound Recog (0-26)* | 61 | 5.9 | 0.0 | 0.0 | 8.9 | ( 0.0 \| 0.0 \| 9.0 ) |

N: The subgroup count of students who had valid KA test scores.
Mean: Arithmetic mean of students in that subgroup
Median: 50th percentile score.
Mode: Most frequently observed aggregate score.
St.Dev: Standard deviation for the Arithmetic mean.
Qrtiles: Aggregate scores at the 1st, 2nd, and 3rd quartiles.
50% of the student had scores between the low and high numbers shown.

**Some Observations:**

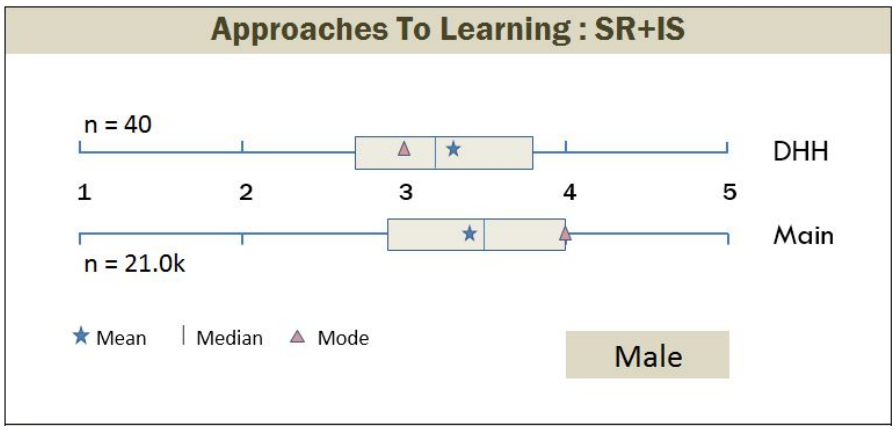
While larger group size is desirable for making comparisons, the D&HH group was further subdivided into race/ethnicity and gender categories (see tables 3 to 10).

This sub-division resulted in subgroup counts too low for much statistical confidence in any interpolation. Induced conclusions need to be corroborated with external or additional assessment.

However one can see that in Fall of 2017, virtually all **aggregated** D&HH scores lagged their counterpart scores in every assessment (see tables 3 and 10).

**Charts:**

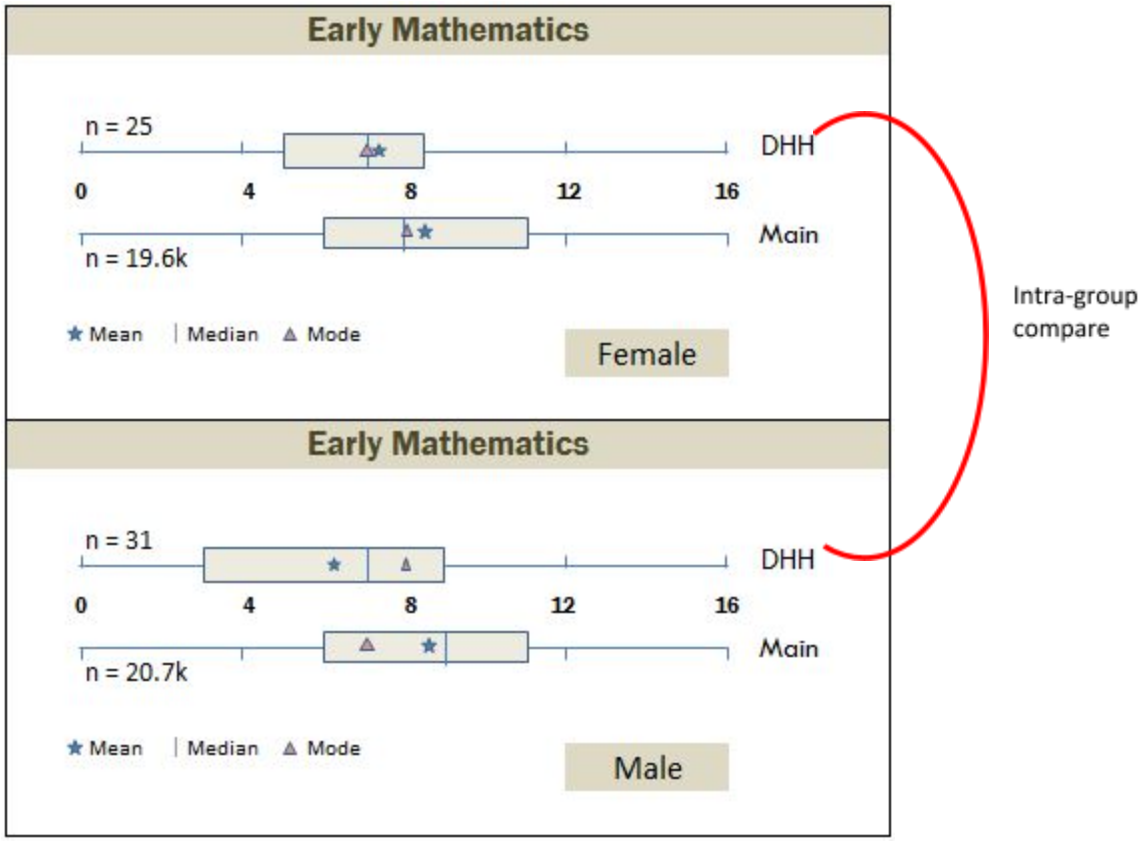
The box-plot charts help visualize the numbers in the tables.
For example, this one compares the Approaches To Learning results of **Male** students of the D&HH and Main groups.




The chart shows some of the commonly used measures of central tendency and also includes a shaded rectangular object to represent the distribution of the scores within the referenced group (**Males**, in this example). The rectangle depicts the Inter-Quartile (IQ) score range (middle 50% of the students). The left side of the IQ box show the 25$^{th}$ percentile and the right side shows the 75$^{th}$ percentile. The median (50$^{th}$ percentile) is the vertical bar somewhere in the middle of the IQ box.

If the vertical bar is not roughly in the middle of the rectangle, then the score distribution is 'skewed' towards the longer section of the box. The X-axis shows the range of scores possible for the test. The group sizes are also shown on the left side of this chart.

Intra-group performance differentials can be visualized by comparing two adjacent charts.




Compare the D&HH Female and Male box-plots. Notice the tighter cluster of scores for the D&HH females compared to the D&HH males. Also note that while both have 75$^{th}$ percentile scores around +8, the 25$^{th}$ percentile mark is significantly lower for the males, and that male score distributon is skewed left. Two-chart compares makes it easier to see that genders scored differentially in D&HH group Early Mathematic scores.

In contrast, a similar gender comparison in the Main group shows their IQ rectangles are fairly equivalent, the middle 50 percent had similar low and high scores. However note the differences in the Mode, and Median statistics for males.