Oregon Kindergarten Assessment
Fall 2019

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

Oregon Department of Education

Kindergarten Assessment   Fall 2019
Results comparing Deaf & Hard of Hearing Kindergarten students to other Kindergarteners

Intro:
Approximately 41 thousand entering Kindergarten students took the Fall 2019 Oregon Kindergarten Assessment (KA).

This assessment looks at the 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 (uppercase and lowercase), and Sound Recognition

This report compares the KA test results of students identified as 'Deaf & Hard of Hearing' (D&HH) with the rest of their cohort (also referenced here as the 'main' group).   The comparison metrics included mode, median, mean, std. deviation and the 25% to 75% interquartile range.

Overall:

The metrics showed differences between the D&HH and main group. The mostly differences favor the main group. In several cases, these differences are '**statistically'** significant. Additionally, the D&HH students lost ground compared to the previous year's (2018 KA) results. However, there were some positive results for D&HH Whites and Females. In the Early Literacy tests, their scores matched or exceeded their non-D&HH counterpart scores.

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

- The D&HH group size is very small compared to the full kindergarten population (typically less than one-fifth of one percent).
- Quantitative differences have not been qualified/aligned/normalized to any future outcomes. In other words, long term effects of these difference is currently undetermined.

Demographic differences (population percentages):
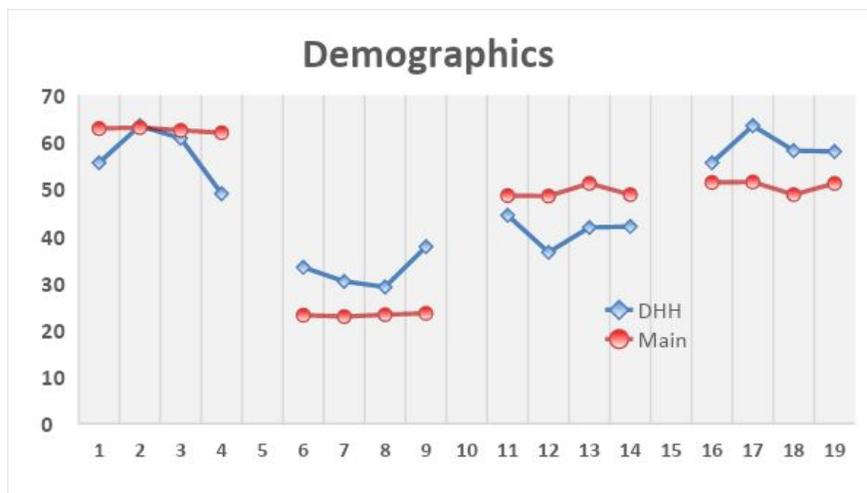
This shows that the population percentages of Whites, Hispanics, Males, and Females have remained constant for entering Kindergarten students. However, the subgroup percentages within the D%HH group are less constant. In 2019, the Whites dropped from 60+% to under 50%, whereas the Hispanic group increased 10%. The other observation is that in the main population, the gender ratio is almost evenly split. In the D&HH group, there are more males than females, especially in the 'White' group.

Assessment score differences:

The following charts are 'median' score based. Because the D&HH group is fairly small (69), the 'mean' metric is more susceptible to being skewed by outliers (extreme numbers on either end of the scores). The 'median' simple reports the central value for the group. Technically, it too can be biased, but after looking at the score distribution, this seemed a better metric to illustrate the difference.

Approaches To Learning:
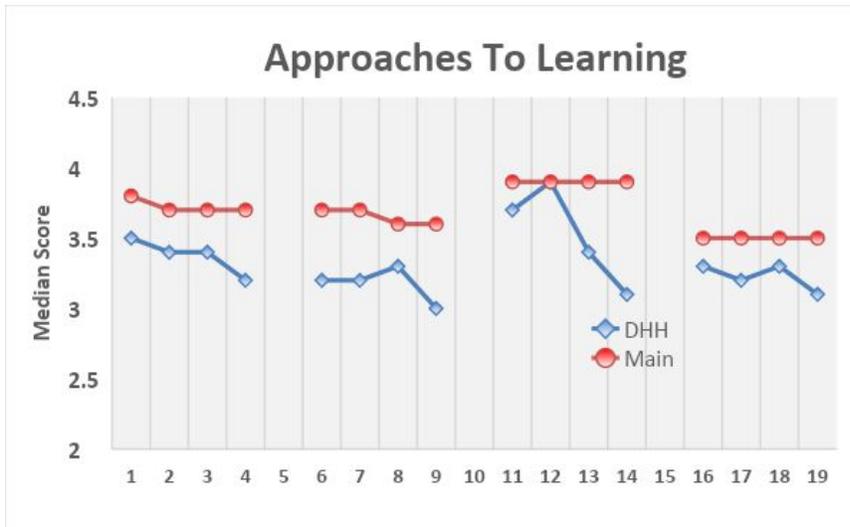
This is a qualitative assessment. The scores are based on teacher evaluation of student behavior over a period of the first few weeks in Kindergarten.

The most significant revelation here is that apart from the lower scores relative to the main group, the D&HH scores show a declining trend over the last four years. Please see accompanying documents for interpreting the score.

Early Mathematics:
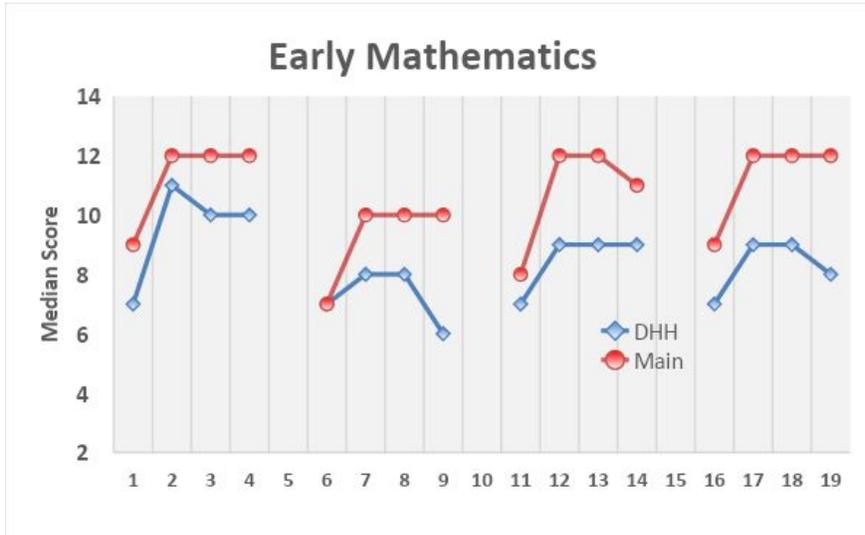
First, note the jump in scores from the 16-17 KA to the 17-18 KA score. This was primarily due to a reduction of item difficulty on the test, essentially making the test a little easier (and technically more appropriate).

The main observation for Early Mathematics assessment is that:

- D&HH scores significantly lag the main group scores.
- For Hispanics and Males, the scores dropped in 19-20 relative to 18-19.

Early Literacy:

Upper and Lowercase English Letter Name Recognition: Though 'median' scores were generally less for the D&HH group compared to the main group, both groups had wide range of scores (25% to 75% interquartile range).

<mark>It is noteworthy, that this year (2019-20), the 'White' and 'Female' D&HH subgroups matched their counterparts in the main group.</mark>

However, the D&HH Hispanic and the males subgroups lagged, and even declined since the previous year.
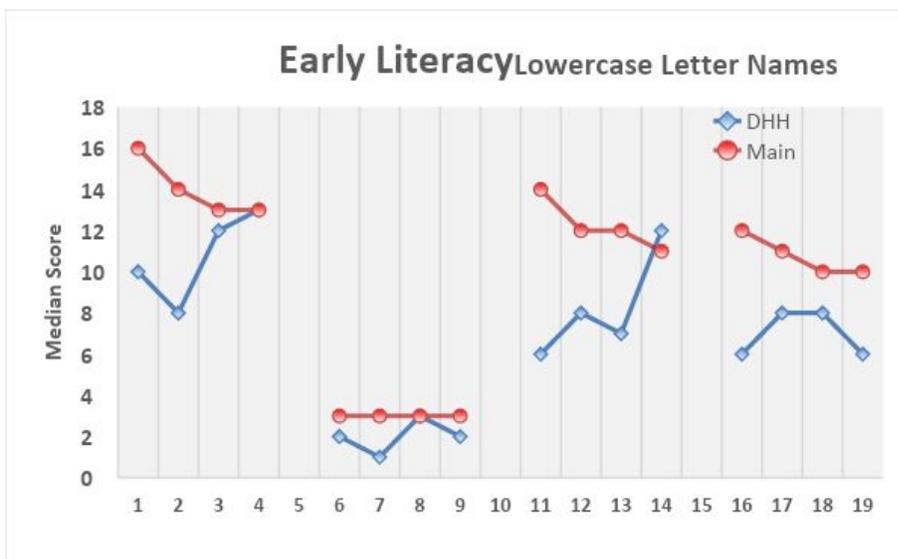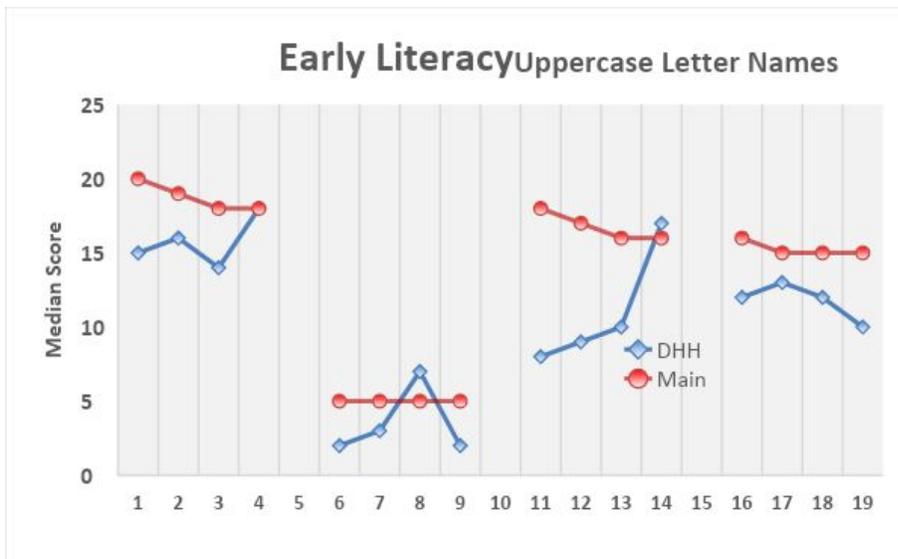
English Letter Sounds Recognition: This test requires the students to vocalize their response.

Early Literacy Letter Sounds
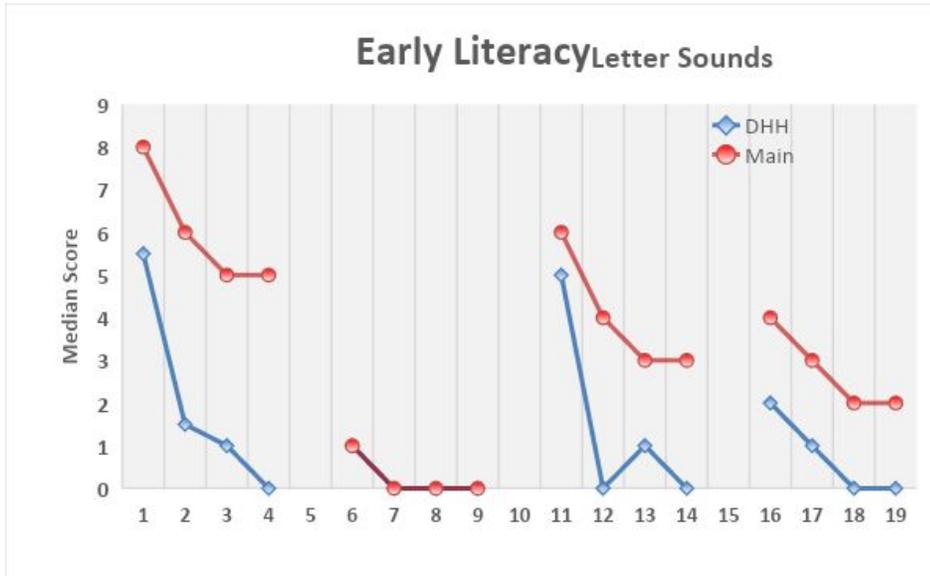
D&HH students may or may not be able to vocalize their responses.   Score comparisons are not advised for this test

Accompanying 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)	69	3.2	3.1	2.9	0.8	(2.8 | 3.1 | 3.8)
Approaches To Learning : Self-Regulation (1-5)	69	3.0	3.1	4.0	0.9	(2.5 | 3.1 | 3.7)
Approaches To Learning : Interpersonal Skills (1-5)	69	3.4	3.4	4.0	0.9	(3 | 3.4 | 4)
Early Mathematics (0-16)	63	8.7	8	5	4.4	(5 | 8 | 11)
Early Literacy: UC Letter Name Recog (0-26)	62	12.9	14	26	10.1	(2 | 14 | 24)
Early Literacy: LC Letter Name Recog (0-26)	62	10.5	7	0	9.4	(1 | 7 | 18)
Early Literacy: Letter Sound Recog (0-26)	61	5.3	0	0	8.4	(0 | 0 | 7)
multiple modes (lower one shown)						

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 2019, 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.
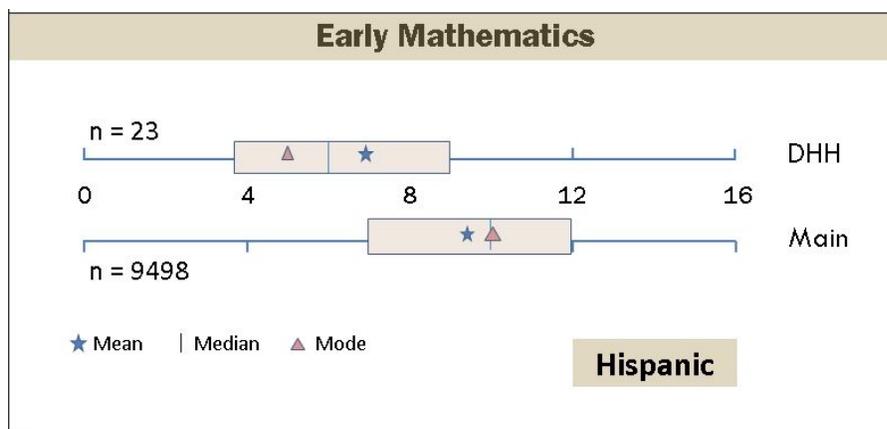
The chart shows some of the commonly used measures of central tendency and also includes a shaded rectangular object to represent the distribution of the scores within the referenced group (**Hispanic**, in this example). The rectangle depicts the Inter-Quartile (IQ) score range (middle 50% of the students). The left side of the IQ box show the 25th percentile and the right side shows the 75th percentile. The median (50th 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.
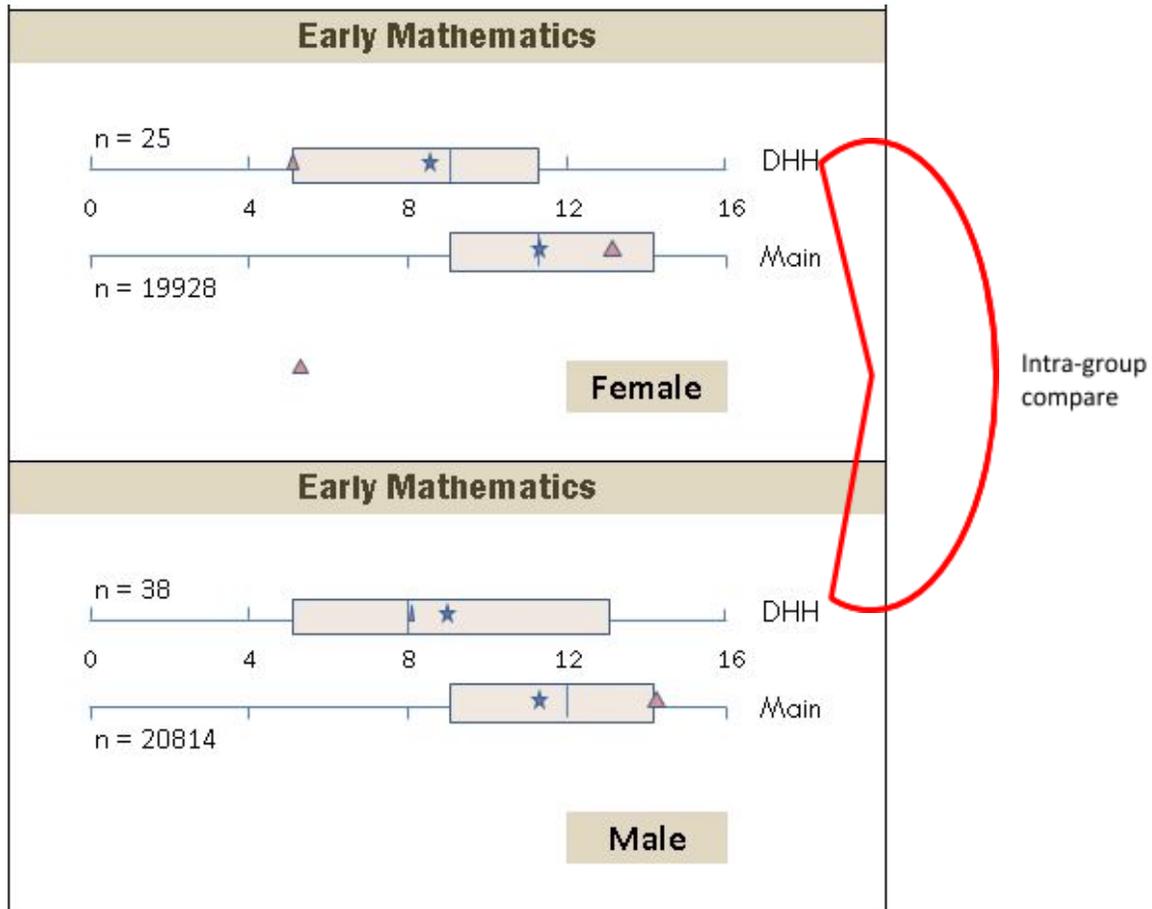
Compare the D&HH Female and Male box-plots. Notice the tighter cluster of scores for the D&HH females compared to the D&HH males. Also note that while both have 75th percentile scores around +8, the 25th percentile mark is significantly lower for the males, and that male score distributon is skewed left. 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.