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Calculating FCAT Local Norms

An informal technical report documenting the construction of FCAT-based local norms and performance flags in Miami-Dade County Public Schools.

Overview of Statistical Approach

Two types of norms are to be constructed: Status Norms and Growth Norms. Generally speaking, a Status Norm reflects the student's absolute standing in FCAT performance within his/her grade-level classmates throughout the district. A Growth Norm, on the other hand, reflects the student's relative standing in FCAT performance within a subpopulation of his/her grade-level classmates that had similar FCAT scores the previous year. The Status Norm (overlooking details) is a z-score/percentile within grade level. The Growth Norm is a z-score/percentile within previous-year's decile group. It is the purpose of this paper to operationally define these two types of local norms.

Data Files

Start with two data files, one for the FCAT **R eading** scores and another for the **Math** scores. The processing steps are identical for the two files, so discussion hereinafter will refer simply to the data file.

The data file minimally needs only five variables – student identification number (StudID), student's current or most recent year grade level (GrdCurr), student's current or most recent year FCAT SSS score (SssCurr), student's grade level from the previous year (GrdPrev), and student's FCAT SSS score from the previous year (SssPrev). In practice, many more variables may be carried along, including student's school number, student's identified teacher, courses taken, demographic variables and any other dimension upon which the averages of these local norms may ultimately be of interest.

All of the processing for creating the norms is performed through SPSS for windows and all discussion herein will be in terms of that software. For ease of processing, all variables except StudID are read in as numeric integers. By treating the variables as numbers, missing data (which is unavoidable and expected) will result in the default case-wise blanking out for constructed norms. For instance, students with no previous year data will not have Growth Norms.

Status Norms

1. Because of ceiling and basement effects, temporarily filter out all records with the current SSS scores equal to 100 or 500. (Data select >100 and <500 on SSS_Curr.)
2. Compute the means and standard deviations for the current SSS scores by current grade level. (Run analyze, SSS-Curr as dependent, compare means, display mean, SD, group Grd_Curr as independent.)
3. Create a separate SPSS data set from the output table of means and standard deviations and merge into active data set. (Cut and paste output table into Excel, save as Excel 97 file, merge on Grd_Curr into SPSS as dataset, rename means and standard deviations M_Curr and SD_Curr, sort on Grd_Curr, merge non-active data set is keyed.)

4. Compute Status Norms as z-scores on all students with valid current SSS scores. (Z_Stat = (SSS_Cur – M_Curr) / SD_Curr.)

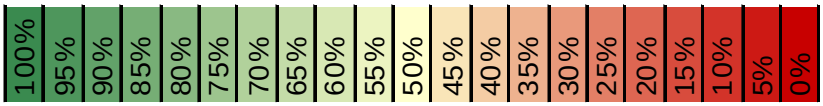
Growth Norms

1. Assign all students with previous year SSS scores into decile groups within their previous year's grade level. (Transform, rank SSS_Prv by Grd_Prv into Rank Types, 10 NTiles , uncheck rank, label Dec_Prv.)
2. Make new variable that is a combination of previous grade level and decile within grade level. (Transform, compute variable, Grd_Dec = 100*Grd_Prv + Dec_Prv.)
3. Temporarily filter out all records with the current SSS scores equal to 100 or 500. (Data select >100 and <500 on SSS_Curr.)
4. Compute means and standard deviations for the current SSS scores by decile within grade level. (Run analyze, SSS-Curr as dependent, compare means, display mean, SD, group Grd_Dec as independent.)
5. Create a separate SPSS data set from the output table of means and standard deviations and merge into active data set. (Cut and paste output table into Excel, save as Excel 97 file, Merge on Grd_Dec into SPSS as dataset, rename means and standard deviations M_Dec and SD_Dec, sort on Grd_Dec, merge non-active data set is keyed.)
6. Select only those students whose previous grade level was 1 less than current grade level. (Compute Grd_Diff = Grd_Curr – Grd_Prv and select on Grd_Diff = 1.)
7. Compute Growth Norms as z-scores on all students with valid current SSS scores and previous SSS scores. (Z_Grow = (SSS_Cur – M_Dec) / SD_Dec.)

Performance Flags

The Status Norm and Growth Norm for students can be aggregated at any level – school, grade level within school, course within school, teacher within school within course, etc. Whether these aggregates are meaningful depends on many factors and the user of these statistics should exercise caution.

To make the aggregated means results easy to interpret, the average z-scores can be converted to percentile equivalents assuming normality. This kind of conversion should not be done before the means are computed, as the percentiles are not on a true interval scale of measurement. The percentiles are then color-coded on a graded three-color scheme from green (above average) to yellow (average) to red (below average) according to the legend below.



Tables with the percentiles color-coded then can be quickly scanned for exceptional cases deserving further investigation as potential problems or exemplary models.