

Less Than 4 Domain Composite Analyses

Tameka Porter
&
H. Gary Cook



Overview

- Background
- Missing domain overall composite PL models
- Benefits & drawbacks of models
- Going forward

Background

- For students with disabilities (and IEPs) who cannot take a domain test, the overall composite score cannot be calculated.
- This impacts students' ability to reclassify as ELs and schools' accountability for those students.
- There is a need to provide an overall composite score for these students.

Background

- This topic was brought up in the November 2017 TAC.
- The TAC's recommendation was to create a white paper identifying methods states could use to create “Less-than-four-domain-composites.”
- This is an update on that recommendation.

Criteria for Creating an Overall Composite Score for Missing Domains

- Applied only students with IEPs requiring that they not take a domain(s)
- Be relatively simple to apply
 - Cook (2013) provides a methodology, but it is complex.
 - Imputation methods have been analyzed but not applied because they are overly complex.

Missing Domain Models

- Model 1: Assign exit score to missing domain(s)
- Model 2: Assign average observed domain scores to missing domain(s)
- Model 3: Assign average z-score of observed domain scores; apply z-score value to obtain a scale score
- Model 4: Conduct a standard setting

Model 1: Assign Exit Score

- Uses state's overall composite proficiency level score as the domain criteria
- Procedure
 - Identify exiting (reclassifying) overall composite proficiency level
 - Assign the lowest exit proficiency level scale score for the missing domain(s)
 - Calculate the overall composite scale score
 - Assign the associated composite proficiency level

Model 2: Assign Observed Average Scale Score

- Uses observed domain scale scores to impute the missing domain(s) score(s)
- Procedure
 - Average the observed scale score values
 - Apply the rounded average to the missing domain(s)
 - Calculate the overall composite scale score
 - Assign the associated composite proficiency level

Model 3: Observed Average Z-score

- Uses observed z-score distribution to impute missing domain(s) score(s)
- Procedure
 - Calculate or apply z-score value(s) for observed domain(s) scale score(s)
 - Average observed z-score(s)
 - Apply average z-score(s) to missing domain(s)
 - Look up z-score for imputed value
 - Calculate the overall composite scale score
 - Assign the associated composite proficiency level

Model 4: Conduct a Standard Setting

- Convenes experts and conducts a standard setting activity that assigns missing domain(s)
- Procedure
 - Identify experts (EL and SWD educators)
 - Adopt a standard setting method
 - Conduct study
 - Identify missing domain(s) value(s)
 - Apply value(s) to missing domains
 - Calculate the overall composite scale score
 - Assign the associated composite proficiency level

Benefits & Drawbacks

| Model | Assumption | Benefit | Drawback |
|--------------------------------------|---|---|---|
| 1 – Assign exit score | Missing domain score should be assumed met for these students | Easiest model to apply. Provides an assumed benefit for the missing score. Conceptually easy to understand. | Likely to provide higher scores for students. |
| 2 – Average observed domain score(s) | Correlations between domains scores are high | Easy to apply. A state can calculate this with its SSR data. Conceptually easy to understand. | If correlations are not high, scores may be overly high or low. Requires SS to PL look up tables to be applied. |

Benefits & Drawbacks

| Model | Assumption | Benefit | Drawback |
|----------------------|--|---|---|
| 3 – Average z-score | Distribution of observed domain scores are normal | Makes a frequently observed assumption about domain score distributions. | More complex. Requires SS to z-score tables and SS to PL tables to be applied. |
| 4 – Standard Setting | In-state experts provide better decisions than score distributions | Uses localized, state-specific experts and criteria. Has a history of being accepted by Peer Reviews. | Requires associated standard setting expertise; somewhat labor and financially intensive. |

Snippets from the paper

- We provide comparative analyses of models 1, 2, and 3.
- We discuss the benefits and drawbacks of each model.
- We provide SAS code examples for models 2 and 3.
- We have partnered with a WIDA state to apply this procedure and discuss our findings. This state (State A) used model 3.
- We are making available z-score tables and SS to PL tables to states to apply these models.

Examples of Tables

Z-score Lookup

| grade | zlist | scale_score_listening |
|-------|--------------|-----------------------|
| 0 | -2.326085434 | 100 |
| 0 | -2.133718678 | 114 |
| 0 | -1.955092405 | 127 |
| 0 | -1.790206613 | 139 |
| 0 | -1.639061305 | 150 |
| 0 | -1.501656479 | 160 |
| 0 | -1.364251653 | 170 |
| 0 | -1.226845827 | 180 |
| 0 | -1.158144414 | 185 |
| 0 | -1.103182484 | 189 |
| 0 | -0.979518141 | 198 |
| 0 | -0.855853797 | 207 |
| 0 | -0.745929937 | 215 |
| 0 | -0.677227524 | 220 |
| 0 | -0.622265593 | 224 |
| 0 | -0.55356318 | 229 |
| 0 | -0.512341732 | 232 |
| 0 | -0.388677389 | 241 |
| 0 | -0.319974976 | 246 |
| 0 | -0.278753528 | 249 |
| 0 | -0.265013046 | 250 |
| 0 | -0.141348702 | 259 |
| 0 | -0.100127255 | 262 |
| 0 | -0.003943877 | 269 |
| 0 | 0.051018054 | 273 |
| 0 | 0.133460949 | 279 |
| 0 | 0.284606258 | 290 |
| 0 | 0.325827706 | 293 |
| 0 | 0.394530119 | 298 |
| 0 | 0.463232532 | 303 |
| 0 | 0.476973014 | 304 |
| 0 | 0.66933977 | 318 |
| 0 | 0.738042189 | 323 |
| 0 | 0.875447009 | 333 |
| 0 | 1.081554248 | 348 |
| 0 | 1.136516178 | 352 |
| 0 | 1.191478109 | 356 |
| 0 | 1.287661487 | 363 |
| 0 | 0 | 0 |
| 1 | -4.145860735 | 100 |

SS-PL Lookup

| domain | grade | scale_scd | pl |
|---------------|-------|-----------|-----|
| Comprehension | 0 | 100 | 1 |
| Comprehension | 0 | 101 | 1 |
| Comprehension | 0 | 102 | 1 |
| Comprehension | 0 | 103 | 1 |
| Comprehension | 0 | 104 | 1 |
| Comprehension | 0 | 105 | 1 |
| Comprehension | 0 | 106 | 1 |
| Comprehension | 0 | 107 | 1 |
| Comprehension | 0 | 108 | 1 |
| Comprehension | 0 | 109 | 1 |
| Comprehension | 0 | 110 | 1 |
| Comprehension | 0 | 111 | 1 |
| Comprehension | 0 | 112 | 1 |
| Comprehension | 0 | 113 | 1 |
| Comprehension | 0 | 114 | 1.1 |
| Comprehension | 0 | 115 | 1.1 |
| Comprehension | 0 | 116 | 1.1 |
| Comprehension | 0 | 117 | 1.1 |
| Comprehension | 0 | 118 | 1.1 |
| Comprehension | 0 | 119 | 1.1 |
| Comprehension | 0 | 120 | 1.1 |
| Comprehension | 0 | 121 | 1.1 |
| Comprehension | 0 | 122 | 1.1 |
| Comprehension | 0 | 123 | 1.1 |
| Comprehension | 0 | 124 | 1.1 |
| Comprehension | 0 | 125 | 1.1 |
| Comprehension | 0 | 126 | 1.1 |
| Comprehension | 0 | 127 | 1.1 |
| Comprehension | 0 | 128 | 1.2 |
| Comprehension | 0 | 129 | 1.2 |
| Comprehension | 0 | 130 | 1.2 |
| Comprehension | 0 | 131 | 1.2 |
| Comprehension | 0 | 132 | 1.2 |
| Comprehension | 0 | 133 | 1.2 |
| Comprehension | 0 | 134 | 1.2 |
| Comprehension | 0 | 135 | 1.2 |
| Comprehension | 0 | 136 | 1.2 |
| Comprehension | 0 | 137 | 1.2 |
| Comprehension | 0 | 138 | 1.2 |
| Comprehension | 0 | 139 | 1.2 |

WIDA plans on providing tables in CSV or Excel formats

A look at the analysis WIDA-wide for 2018

- Number of ELs: 2,047,592
 - ... with IEPs or 504s plans: 250,459 (12.2%)
 - ...with missing domains: 5,136 (2.1% of IEPs or 504s)
- Of the 5,136 students, how many have specific statements in their IEPs or IAPs (for 504 plans) that exempt them from a domain? **Uncertain**

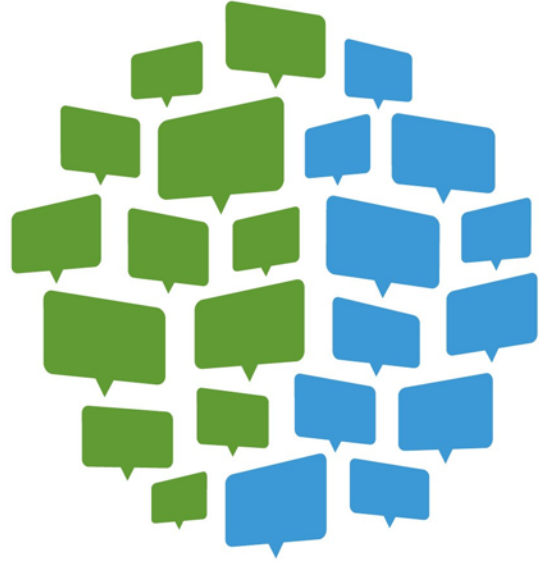
A look at the analysis in State A for 2018

- Number of ELs: 51,272
 - ... with IEPs or 504 plans; 7,734 (15.1%)
 - ...with missing domains: 142 (1.8% of IEPs or 504s)
 - ... with statements requiring the to be exempt from domain tests, checked by State A SEA assessment staff: 40 (0.5% of IEPs or 504s)
- The number of students qualifying for a less-than-four-domain composite scores is small.

Questions

Again, our plan is to provide a guidance paper and the requisite code and examples to states to support the creation of “less-than-four-domain” composite scores.

- **Are there any additional recommendations about our process?**
- **Do you have any concerns?**



WIDATM