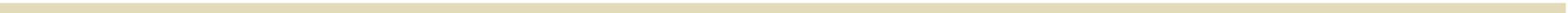# Establishing a Stopping Rule for an Instructionally Informative Diagnostic Assessment of Algebra Readiness!

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Rationale for Diagnostic Assessment of Algebra Readiness!

- Recent student performance data indicate that 27% of 8th students are considered *P   c -   * and only 9% are considered *Ad a c- d* on the most recent NAEP (NCES, 2013)!

- More states, districts, and schools are implementing multi-tiered integrated models of instruction and assessment to help identify students who may struggle to reach grade-level proficiency standards !

- Successfully supporting these students requires access to theoretically-grounded, technically adequate diagnostic assessments to help teachers pinpoint   students may struggle with the content!

Why are Stopping Rules Important?!

- Rationale for including a stopping rule in an assessment is fourfold!

How do you establish a stopping rule?!

- Consider the type of information about student errors you wish to collect!

  - Slips: Random errors in students' procedural and declarative knowledge!

    - Focus on mastery of content within the domain!

  - Bugs: Persistent misconceptions about domain-specific knowledge or skills that consistently interfere with students' ability to demonstrate their understanding of the content!

How do you establish a stopping rule?!

- Potential criteria to consider!

    !

Structure of MSTAR Learning Progression!

Analyses!

- Two types of stopping rules are proposed!

Analyses!

- Efficiency!

    - Use 2 PL item parameters to estimate (a) student ability and (b) probability that student will respond correctly to next item (conditional on the ability estimate and known item parameters)!

    - Use logistic regression to treat correct responses on the next item as a dichotomous DV and number of sequential incorrect responses (e.g., 1, 2, 3) as IV!

- Reliability!

    - Use 2 PL item parameters, estimate student ability and overall measurement reliability after each item response!

Results - Efficiency!

Level	80% or higher	70% - 80%	60 – 70%	Less than 60%
4	0.31	0.40	0.37	0.47
5	0.31	0.40	0.34	