



HIGHSCOPE®

Summary Report

COR for Kindergarten  
Validation Study

January 2016

## COR for Kindergarten Overview

HighScope Educational Research Foundation developed an assessment tool for use by kindergarten teachers. This tool, COR for Kindergarten, provides an observation-based authentic assessment that kindergarten teachers can successfully administer and reliably score. It offers kindergarten entry and ongoing information that teachers can use to inform instruction, families can use to make decisions about their children's learning opportunities, and other stakeholders can use to inform efforts to close the school readiness gap.

COR for Kindergarten is comprised of two assessments, the Kindergarten Entry Record (KER) and the Ongoing Record (OR), and four progress-monitoring tools. The KER consists of 20 items across the five domains identified by the National Education Goals panel as essential for later school success: Literacy and Language (LL), Mathematics (MATH), Health and Physical Development (HPD), Approaches to Learning (ATL), and Social and Emotional Development (SED) (Kagan, Moore, & Bredekamp, 1995). It is an observation-based assessment administered during the first few months of school. The KER measures what a child knows and can do at kindergarten entry.

The Ongoing Record (OR) is an observation-based assessment that measures the same five domains and consists of the 20 KER items and 10 more items that kindergarten teachers and experts identified as useful to track throughout the kindergarten year. Teachers administer the OR up to three times across the school year after completion of the KER. The OR measures attainment of end-of-year kindergarten standards.

### Testing the COR for Kindergarten Assessments

HighScope conducted three sequential studies to test and refine the assessment items and data system: an initial pilot, a revised pilot, and an implementation study. We assessed 1,982 children across the studies. The results of the psychometric analysis of the implementation study follow.

### Implementation Study

During the 2016–2017 school year, 79 kindergarten teachers from 28 schools in seven states participated in the COR for Kindergarten implementation study. The schools consisted of 6 schools and 16 Local Education Agencies and 6 Public School Agencies that were geographically located in a mixture of rural, suburban, middle-size cities, urban fringe, and urban areas. Children came from a wide range of socioeconomic backgrounds based on their free/reduced lunch counts and a review of the cost of attending the private and unsubsidized schools. These teachers rated 1,506 kindergarten children using the Kindergarten Entry Record (KER) and 738 kindergarten children using the Ongoing Record (OR).

After the teachers completed each assessment, we examined whether the levels used to assess children's progress indeed follow the developmental progression theorized and conducted reliability and validity studies. We also examined whether the structure of the instrument is consistent in distinctly capturing the various developmental content areas. Dr. Everett Smith, Psychometric Consultant, analyzed the data on Conquest using the Multidimensional Partial Credit Rasch Model.



## Implementation Study Results

**Scale Reliabilities (Chronbach's Alpha):** We show the COR for Kindergarten Domain Scale reliabilities in Figure 1, along with the number of items per domain, for a sample of N=1,506 children attending kindergarten. There was an increase from the pilot study in four domains; only the ATL domain remained the same.

Figure 1

### KER: Scale Reliabilities

<u>COR for Kindergarten Domains</u>	<u># of Measures</u>	<u>Reliability</u>
LL: Literacy and Language	6	.86
M: Mathematics	4	.87
HPD: Health and Physical Development	3	.86
ATL: Approaches to Learning	3	.86
SED: Social and Emotional Development	4	.93

(n=1,506)

**Domain Correlations (Rasch):** We show the intercorrelations among the domains of the COR for Kindergarten in Figure 2. Some of the scores are highly correlated and some are not, appropriately reflecting that young children progress at different rates in different areas of development.

Figure 2

### KER: Domain Correlations

<u>COR for Kindergarten Domains</u>	<u>Math</u>	<u>HPD</u>	<u>ATL</u>	<u>SED</u>
LL	.720	.495	.601	.402
MATH		.362	.487	.345
HPD			.775	.877
ATL				.800

All correlations significant at  $p < .01$

**Model Fit, Wright Maps, and Item Curve Characteristics (Rasch):** The weighted and unweighted Mean-Square fit statistics for the items were all below 1.4 meaning that we did not observe misfit for any item beyond that expected within the Partial Credit Rasch model. The Wright Maps and the polytomous Item Curve Characteristics across the items provide further evidence of an orderly successive progression of developmental levels.

**Inter-rater Reliability:** The effects of training on inter-rater agreement were determined through a study conducted by presenting trained teachers with 23 scenarios that described a child's behavior, such as, *Jeff was able to identify the following letters of the alphabet (A, J, e, f, B, l). What score would Jeff get for Letter Identification?* The teachers used the COR for Kindergarten KER to rate each scenario. We used a proprietary survey tool, KeySurvey, to



administer the inter-rater reliability assessment and to gather the data. We compared the teacher rater scores to the scores given by a team of HighScope raters who are familiar with using the instrument. Using the data collected from 24 teachers (raters) and 23 scenarios, we used three measurements of inter-rater agreement: exact and adjacent agreement percentages, Kappa for polytomous responses, and intra-class correlation using a two-way ANOVA random model. (Both scenarios and teachers are random samples of their respective populations.)

The average exact percentage among the 23 scenarios is about 85%, while the adjacent percentage is 95%. The average Kappa for multiple response options is 0.65; levels above .61 imply substantial amount of agreement. The ICC (reliability of the mean) is 0.993, (95% CI: 0.988, 0.996), implying a great degree of agreement among raters and suggesting that the scenarios, on average, were coded similarly among the 24 teacher raters.

### Implementation Study Results: Ongoing Record

**Scale Reliabilities (Chronbachis Alpha):** We show the COR for Kindergarten OR Domain Scale reliabilities in Figure 3, along with the number of items per domain, for a sample of N=738 children attending kindergarten.

Figure 3

#### OR: Scale Reliabilities

COR for Kindergarten Domains	# of Measures	Reliability
LL: Literacy and Language	10	.90
M: Mathematics	8	.80
HPD: Health and Physical Development	4	.75
ATL: Approaches to Learning	4	.83
SED: Social and Emotional Development (n=738)	4	.86

**Domain Correlations (Rasch):** We show the intercorrelations among the domains of the COR for Kindergarten OR in Figure 4. Again, some of the scores are highly correlated and some more moderately, appropriately reflecting that young children progress at different rates in different areas of development.

Figure 4

#### OR: Domain Correlations

COR for Kindergarten Domains	Math	HPD	ATL	SED
LL	.607	.683	.609	.508
MATH		.396	.616	.396
HPD			.641	.739
ATL				.750

All correlations significant at  $p < .01$



**Model Fit, Wright Maps, and Item Curve Characteristics (Rasch):** The weighted and unweighted Mean-Square fit statistics for the items were all below 1.4, meaning that we did not observe misfit for any item beyond that expected within the Partial Credit Rasch model. The Wright Maps and the polytomous Item Curve Characteristics across the items provide further evidence of an orderly successive progression of developmental levels.

## Summary

The implementation study results show that the COR for Kindergarten assessment provides reliable and valid psychometric measurement of the development of children entering kindergarten and throughout the kindergarten year for five key domains. Expected levels of intercorrelations between domains are evident in the data. The Wright Map shows that our *a priori* predictions about the relative difficulty of items were correct. Items that are more difficult (i.e., retelling stories and writing) are at or near the top and items that are less difficult (i.e., letter identification and gross-motor skills) are at or near the bottom. Our Wright Map of MLE Estimates and Thresholds shows the general orderliness with which the polytomous item steps group with developmental level 1 at the bottom, followed by levels 2 and levels 3, with level 4 at the top. The polytomous Item Curve Characteristics across the items provide evidence of an orderly successive progression of developmental levels.

Our challenge was to create a kindergarten entry assessment and ongoing assessment that conforms to early childhood assessment standards (observation-based authentic assessment), that is practical to administer during the first few months of kindergarten and throughout the year, and that provides useful and meaningful results teachers can use to inform their instruction. HighScope met that challenge in creating COR for Kindergarten.

## Reference

Kagan, S.L., Moore, E., & Bredekamp, S. (Eds.). (1995, June). *Reconsidering children's early development and learning: Toward common views and vocabulary*. Goal 1 Technical Planning Group Report 95–03. Washington, DC: National Education Goals Panel.

