

Technical Report of the COR Advantage Validation Study

--Phase I--

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Center for Early Education Evaluation
HighScope Educational Research Foundation



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The Child Observation Record (COR)

The Child Observation Record (COR), initially developed in 1993 by HighScope Educational Research Foundation, is an observation-based instrument that provides systematic assessment of young children’s knowledge and abilities in all major areas of development. Teachers or caregivers spend a few minutes each day writing brief notes or “anecdotes” that objectively describe significant episodes of young children’s activities. The anecdotes are then classified and scored according to various COR categories, items, and levels, and information is compiled to provide a comprehensive portrait of each child’s developmental gains and the progress of the group as a whole.

A few recent developments, including research on child development and early childhood education, recent policies concerning young children, and feedback from current COR users (teachers and administrators), identified three specific needs for revising the COR. These included (1) the need for an instrument that can document the developmental trajectories of children from birth through kindergarten in all key areas of children’s development; (2) the need for an instrument that can capture developmental milestones of children from varied backgrounds with diverse abilities; and (3) the need for an instrument that can reliably serve the dual purpose of monitoring child development and capturing program impact.

In response to these specific needs, in 2012 HighScope’s early childhood curriculum development staff took the lead in revising the 2003 version of the COR to span the developmental range from infant and toddler through kindergarten (prior versions separated the infant-toddler COR from the Preschool COR). The revised COR items were made consistent with the new HighScope Curriculum content (the key developmental indicators or KDIs), the Head Start Child Development and Learning Framework, Common Core Standards for kindergarten, state standards, and the guidelines of professional organizations in literacy, mathematics, science, social studies, and other domains. Each KDI features a chart describing what children at different levels of development may say and do on that dimension of learning, and ways that teachers can scaffold children’s learning to reach the next stage of development. The revised COR items are based on these developmental charts and extend downward to the infant-toddler level and upward to kindergarten. In addition, psychometric data from the current version of the COR (for example, on developmental scaling of items) was considered during the revision process.

Table 1 summarizes how the revised COR, called **COR Advantage**, meets the specific needs identified above .

Table 1: Advantages of COR Advantage

Specific Needs	Benefits of COR Advantage
#1 — Instrument is for children aged birth through kindergarten	Meets the need with a single tool
#2 — Instrument that captures diversity	Meets the need with a single tool
#3 — Instrument that both monitors development and captures program impact	Instrument is developed and is being validated for dual purposes.

Summary of the Benefits of the COR Advantage

1. The COR Advantage covers the developmental period from infancy through kindergarten such that teachers will be able to monitor the entire developmental trajectory of a child from birth through kindergarten without the need to transition from one tool to the next.
2. The COR Advantage assesses all key developmental areas of children’s progress, including children’s kindergarten readiness and success.
3. The COR Advantage is aligned with the Head Start Child Development and Early Learning Framework (which covers all areas of development) and Common Core Standards for Kindergarten (comprising literacy and mathematics), as well as state standards and the recommendations of professionals in various content areas.
4. The COR Advantage allows teachers from inclusive classrooms to capture developmental trajectories of children.
5. The reliability assessment delivered as a part of the COR Advantage training is designed to evaluate training on the use of COR Advantage to detect and account for variability in teachers’ scorings of their children (scorer leniency/severity). This system allows for a more accurate and fair comparison of children across different classrooms.

Findings from Phase I Validation Study

In spring of 2012, HighScope began its Phase I validation of the **COR Advantage** in partnership with an expert consultant at the University of Illinois at Chicago. This document summarizes the preliminary findings from this first phase of the multi-phase validation study.

A total of 71 teachers from eight programs, 44 classrooms (3 infant, 9 toddler, 19 preschool, and 3 kindergarten) participated in the study. The programs consisted of private child care centers, and state- and federally-funded programs, such as Michigan's Great Start Readiness Program, Head Start, and Early Head Start. Children, therefore, came from a wide range of socioeconomic backgrounds from extremely low- to upper-middle income families. A total of 367 children aged 0 to 6 were observed by these teachers using the COR Advantage.

Reliability

Interscorer Reliability

Participating teachers were trained on the COR Advantage and completed the reliability assessment. A total of 212 video clips and vignettes were prepared, and each teacher scored a set of 90 video clips and vignettes for the reliability assessment. Teachers' scores were compared against anchor scores, which were determined by consensus among COR Advantage developers and HighScope early childhood specialists. Average exact agreement for each content area ranged from 78.0% (approaches to learning) to 93.5% (social studies), for a total average agreement of 85.7% across all content areas.

Internal Consistency

Cronbach's alpha was used to examine the internal consistency of the COR Advantage items. High alphas were found for each of the COR content areas, ranging from $r = 0.87$ (physical development and health) to $r = 0.94$ (language, literacy and communication).

Validity

Content Validity

In the spring/summer of 2012, content experts reviewed the initial draft of COR Advantage. A total of 26 individuals¹ contributed diverse perspectives from early childhood theory and research, assessment, program practices, professional development, administration, and educational policy and advocacy on the preliminary draft. The 11 external reviewers had

¹ Sue Bredecamp, PhD; Barbrina B. Ertle, PhD; Amy Goerl; Virginia A. Marchman, PhD; Jeanne Montie, PhD; Deborah Stipek, PhD and many HighScope field consultants and staff members.

general expertise in child development and specific knowledge in one or more developmental domains represented in the COR: approaches to learning; social-emotional development; physical development and health; language, literacy and communication; mathematics; creative arts; science and technology; social studies; and English language and learning. Reviewers rated COR Advantage on overall comprehensiveness and feasibility, appropriateness of the domains chosen, representativeness of the items within each domain, correctness of developmental progression (scoring levels within each item), and clarity of descriptions and anecdotes. They rated COR Advantage highly, all marking “strongly agree” or “agree” with regard to its comprehensiveness (addresses key domains of early development), feasibility (can be reliably completed by trained users), clarity, representativeness, and sequencing of specific domains, items, and levels. There was a single exception for one mathematics item, which was rated “mixed” by one reviewer. Suggested changes from the reviewers were made, and this subsequent draft was used in classroom field testing. An additional content expert in English Language Learning (ELL) was consulted.

Substantive and Structural Validity

Initial findings using data from the pilot reliability assessment (see the Interscorer Reliability section for details on the reliability assessment) showed that (1) the empirical item difficulty order was theoretically expected (i.e., items designed to represent level 1 are the hardest items to give high scores to, items designed to represent level 7 are the easiest items to give high scores to) and (2) the categories follow the theorized developmental categories.

For the few (Rasch) misfitting teachers and items and those items not scored accurately (i.e., teacher score does not match subject matter expert score) COR subject matter experts determined modifications to teacher training and/or the videos/vignettes to address the misfit.

External Validity

These findings from substantive and structural validity were supported with actual classroom data. For every content area, age was positively correlated with children’s scores. Preliminary analyses using analysis of variance with post hoc multiple comparison test also indicated that the differences in scores at each age category (0, 1, 2, 3, 4, and 5 years old) were significant at $p < .001$. In other words, children’s progress, as indicated by COR Advantage scores, followed the theorized developmental progression.

To address external validity (or concurrent validity), we examined associations between children’s COR Advantage scores and their standardized assessment scores, measured using the Woodcock-Johnson Tests of Achievement, 3rd edition,² the Bayley Infant-Toddler Development

² Mather, N., & Woodcock, R.W. (2001). *Examiner’s manual. Woodcock-Johnson III Tests of Achievement*. Itasca, IL: Riverside Publishing; McGrew, K.S., & Woodcock, R. W. (2001). *Technical Manual. Woodcock-Johnson III*. Itasca, IL: Riverside Publishing.

Scale 3rd edition,³ and the Social Skills Improvement System.⁴ The purpose was to determine how well the various COR Advantage content areas capture important skills and knowledge in these areas as assessed by other established instruments.

For infants and toddlers aged 0–2, COR Advantage scores were highly correlated with Bayley-3 results. Table 2 summarizes the correlations between children’s COR Advantage content area scores and results from the various sections of the Bayley-III and the Bayley social-emotional questionnaire responses obtained from teachers.

For preschool and kindergarten children, correlations between COR Advantage and standardized assessment scores were moderate to high in many content areas. Especially high were the correlations between COR Advantage Language, Literacy, and Communication content area scores and Woodcock-Johnson III Letter-Word Identification subtest scores ($r(128)=.58$, $p<.001$), and COR Advantage Mathematics scores and Woodcock-Johnson III Applied Problem (Mathematics) subtest scores ($r(127)=.60$, $p<.001$). To examine COR Advantage’s Approaches to Learning and Social and Emotional Development content areas, teachers completed the Social Skills Improvement System questionnaire about children’s social skills and adaptive behaviors. Table 3 summarizes the results of the correlations.

³ Bayley, N. (2005). *Bayley Scales for Infant and Toddler Development, Third Edition*. San Antonio, TX: Pearson.

⁴ Gresham, F., & Elliott, S. N. (2008). *Social Skills Improvement System*. San Antonio, TX: Pearson.

Table 2: Correlations Between Infant and Toddler COR Advantage Content Area Scores and Bayley-3 scores (*N* = 60–64)

	Bayley-III Sections					
COR Advantage Content Areas	Social-emotional (teachers' questionnaire)	Receptive Communication	Expressive Language	Fine Motor	Gross Motor	Cognitive
Approaches to Learning	.85***	.89***	.84***			.89***
Social & Emotional Development	.87***	.84***	.87***			.86***
Physical Development & Health				.74***	.81***	
Language, Literacy, and Communication				.86***	.90***	
Mathematics						.88***
Creative Arts						.88***
Science & Technology			.78***	.75***		
Social Studies			.83***	.82***		

Note. ****p* < .001

Table 3: Correlations Between Preschool and Kindergarten COR Advantage Content Area Scores and WJ-III and SSIS scores (N = 105 – 128)

	Woodcock-Johnson III					SSIS			
COR Advantage Content Areas	Letter-Word Identification	Story Recall	Math	Science	Social Studies	Assertion (Subscale)	Empathy (Subscale)	Engagement (Subscale)	Social Skills Total (Standard Score)
Approaches to Learning						.36***	.21*	.23*	.26**
Social & Emotional Development						.47***	.30**	.37***	.37***
Physical Development & Health	No comparable standardized assessment subtest								
Language, Literacy, and Communication	.58***	.44***							
Mathematics									
Creative Arts	No comparable standardized assessment subtest								
Science & Technology				.20*					
Social Studies				.32**					

Note. * $p < .05$; ** $p < .01$, *** $p < .001$

Future Directions

HighScope continues the partnership with the University of Illinois at Chicago as we design Phase II of the validation study, which is scheduled to begin in the summer of 2014. In Phase II, we will recruit a nationally representative sample of programs, teachers, and children to address three issues — including teacher bias, differential item functioning, and a school readiness benchmark.

First, research has found that teacher-scored instruments may be biased by scorer leniency/severity.⁵ In other words, one teacher may give a higher/more favorable score to a child than another teacher would give to the same children. These differences between teachers in levels of leniency/severity may largely explain variation in children's assessed abilities and skills. Scorer leniency/severity can influence the validity of inferences being made, especially when used as an accountability measure in capturing program impact. To address the issue of scorer leniency/severity, an online reliability assessment was developed to accompany the COR Advantage training. With a nationally-representative sample, we will utilize the multi-facet Rasch model to adjust for scorer differences in severity/leniency, as well as diagnose areas where other scorer effects may be an issue. We will also use the reliability assessment results to link teacher scores in one frame of reference on the COR Advantage. This will allow us to compare children's scores across classrooms and programs more reliably.

Second, the COR Advantage is designed to assess the development of children across multiple ages, linguistic and cultural backgrounds, and abilities. With a larger nationally representative sample, we will further investigate differential item functioning across various contexts (age, gender, race, and ethnicity).

Third, with a nationally representative sample, we will establish a benchmark or school readiness index. The benchmark or school readiness index will serve as a guideline to programs for determining, for each content area, at which level or levels children are ready for school. In addition, by following children longitudinally, Phase II will allow us to examine the predictive validity of the COR Advantage (i.e., how earlier COR scores can predict children's readiness at kindergarten entry).

⁵ Waterman, C., McDermott, P.A., Fantuzzo, J.W., & Gadsden, V.L. (2012). The matter of assessor variance in early childhood education — or whose score is it anyway? *Early Childhood Research Quarterly*, 27, 46–54.

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About HighScope Educational Research Foundation

Founded in 1970, the HighScope Educational Research Foundation is an independent, nonprofit 501(c) 3 organization with headquarters in Ypsilanti, Michigan. HighScope's mission is to lift lives through education so everyone can succeed in life and contribute to society. Its vision is widespread participatory education in which students and teachers are partners in shaping the learning experience. To this end, it engages in evaluative research, development of curriculum, training, and assessment materials, and dissemination through educational services and publishing. These activities target teachers and service workers, primarily in early childhood programs and also in elementary schools and out-of-school youth programs. It also disseminates research findings to those who influence children's lives, such as teachers, service workers, parents, administrators, policymakers, academics, and researchers. The Foundation also has initiatives in early childhood literacy and elementary education.

The Center for Early Education Evaluation at HighScope is the research and evaluation arm of the HighScope Educational Research Foundation. Originally the research division of HighScope, the Center was established in July, 2012 to better reflect the role of the Center as an internal evaluator of HighScope's products and services, as well as an external evaluator and consultant for states and provider agencies.

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