Technical Report of the COR Advantage Validation Study

—Phase I—

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

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

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 individuals\(^1\) 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 difficult
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 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

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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.

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

<table>
<thead>
<tr>
<th>COR Advantage Content Areas</th>
<th>Social-emotional (teachers' questionnaire)</th>
<th>Receptive Communication</th>
<th>Expressive Language</th>
<th>Fine Motor</th>
<th>Gross Motor</th>
<th>Cognitive</th>
</tr>
</thead>
<tbody>
<tr>
<td>Approaches to Learning</td>
<td>.78***</td>
<td>.82***</td>
<td>.83***</td>
<td></td>
<td></td>
<td>.84***</td>
</tr>
<tr>
<td>Social &amp; Emotional Development</td>
<td>.85***</td>
<td>.89***</td>
<td>.84***</td>
<td></td>
<td></td>
<td>.89***</td>
</tr>
<tr>
<td>Physical Development &amp; Health</td>
<td>.87***</td>
<td>.84***</td>
<td>.87***</td>
<td></td>
<td></td>
<td>.86***</td>
</tr>
<tr>
<td>Language, Literacy, and Communication</td>
<td>.86***</td>
<td>.90***</td>
<td></td>
<td>.74***</td>
<td>.81***</td>
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</tr>
<tr>
<td>Mathematics</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>.88***</td>
</tr>
<tr>
<td>Creative Arts</td>
<td></td>
<td></td>
<td></td>
<td>.88***</td>
<td>.81***</td>
<td>.89***</td>
</tr>
<tr>
<td>Science &amp; Technology</td>
<td>.78***</td>
<td>.75***</td>
<td></td>
<td></td>
<td></td>
<td>.84***</td>
</tr>
<tr>
<td>Social Studies</td>
<td>.83***</td>
<td>.82***</td>
<td></td>
<td></td>
<td></td>
<td>.79***</td>
</tr>
</tbody>
</table>

*Note.* ***p < .001
<table>
<thead>
<tr>
<th>COR Advantage Content Areas</th>
<th>Woodcock-Johnson III</th>
<th>SSIS</th>
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</thead>
<tbody>
<tr>
<td>Letter-Word Identification</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Story Recall</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Math</td>
<td></td>
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<td></td>
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<tr>
<td>Science</td>
<td></td>
<td></td>
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</tr>
<tr>
<td>Social Studies</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Assertion (Subscale)</td>
<td>.36***</td>
<td>.21*</td>
<td>.23*</td>
</tr>
<tr>
<td>Empathy (Subscale)</td>
<td>.47***</td>
<td>.30**</td>
<td>.37***</td>
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<tr>
<td>Engagement (Subscale)</td>
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<tr>
<td>Social Skills Total (Standard Score)</td>
<td>.26**</td>
<td>.37***</td>
<td></td>
</tr>
<tr>
<td>Physical Development &amp; Health</td>
<td>No comparable standardized assessment subtest</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Language, Literacy, and Communication</td>
<td>.58***</td>
<td>.44***</td>
<td></td>
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<tr>
<td>Mathematics</td>
<td></td>
<td></td>
<td>.60***</td>
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<td>Creative Arts</td>
<td>No comparable standardized assessment subtest</td>
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<tr>
<td>Science &amp; Technology</td>
<td></td>
<td>.20*</td>
<td></td>
</tr>
<tr>
<td>Social Studies</td>
<td></td>
<td>.32**</td>
<td></td>
</tr>
</tbody>
</table>

*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. 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).

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Acknowledgements

Our partnerships with the following organizations made this study possible: BHK Child Development, Head Start programs in Baraga, Houghton and Keweenaw Counties in the Upper Peninsula of Michigan; Bishop Elementary School in Ypsilanti, Michigan; Gretchen’s House programs in Southeast Michigan; The HighScope Demonstration Preschool in Ypsilanti, Michigan; Jewish Community Center Early Childhood Center in Ann Arbor, Michigan; Perry Nursery School in Ann Arbor, Michigan; Starfish Family Services Early Head Start in Inkster, Michigan; and Wayne County Head Start in Detroit, Harper Woods, Southgate, and Taylor, Michigan. We would like to extend our heartfelt appreciation to the directors and supervisors, teachers, parents, and children who contributed their precious time to this study, and Dr. Everett V. Smith at the University of Illinois at Chicago for his expert advice.

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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