Parent Aware

Minnesota's Quality Rating and Improvement System

Initial Validation Report

Kathryn Tout, Jennifer Cleveland, Weilin Li, Rebecca Starr, Margaret Soli, & Erin Bultinck

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Child TRENDS

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United Way

Greater Twin Cities United Way

The Parent Aware Evaluation: Initial Validation Report

Kathryn Tout, Jennifer Cleveland, Weilin Li, Rebecca Starr, Margaret Soli, & Erin Bultinck
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The Parent Aware Evaluation

Parent Aware is Minnesota's Quality Rating and Improvement System (QRIS). The Parent Aware Evaluation is designed to provide information about the implementation and effectiveness of Parent Aware in promoting children's optimal development and school readiness.

Child Trends, a nonpartisan, nonprofit research organization is conducting the evaluation from 2012-2016. The Parent Aware Evaluation is funded by Parent Aware for School Readiness (PASR), Greater Twin Cities United Way, and Minnesota's Race to the Top – Early Learning Challenge grant.

The following research questions will be addressed in the evaluation reports.

Research Question	Report
How is Parent Aware implementation proceeding? Child Trends will study the implementation of Parent Aware, including the marketing campaigns and tools, quality improvement supports for programs, recruitment and retention of programs, and the rating process. Perceptions of how Parent Aware is working for participants and families from the perspective of early care and education providers and Parent Aware staff will be collected through surveys and interviews.	Year 1 and 2 Annual Reports 2013, 2014 and 2015 Provider Perception Reports
Is quality improving in Parent Aware-Rated programs? Ratings data will be analyzed to track changes over time on programs' quality levels and their achievement of quality indicators.	Year 3 and 4 Annual Reports
How is children's development related to Parent Aware ratings? Children in Parent Aware programs will be recruited to participate in a fall and spring developmental assessment aimed at measuring kindergarten readiness skills. Analyses will examine how ratings are linked to children's development.	Initial Validation Report
How effective are the quality indicators and rating structure used in Parent Aware ratings? Child Trends will conduct a validation of the Parent Aware indicators and rating structure and assess the extent to which the Parent Aware ratings are capturing program quality accurately and reliably.	Initial Validation Report
What is the role of Parent Aware in Minnesota's early care and education system? A qualitative analysis will be conducted to understand the role of Parent Aware and the Race to the Top-Early Learning Challenge grant in supporting Minnesota's early care and education system.	Year 1 and 4 Annual Reports

Public reports are available at http://www.pasrmn.org/work/research.

Initial Validation of Parent Aware: Brief Summary

Parent Aware is Minnesota's Quality Rating and Improvement System (QRIS) for early care and education (ECE) programs. The purpose of the Parent Aware Initial Validation Study is to examine the extent to which the rating process and the four star quality ratings that are awarded are fair, accurate and meaningful. The findings will be used to inform improvement of Parent Aware as it continues to expand across Minnesota.

The validation study analyzes multiple sources of evidence including observations of quality in 325 Parent Aware-rated programs and direct assessments of developmental skills in nearly 1,200 children in both the fall and spring of their year before kindergarten. The study was conducted with all program types participating in Parent Aware: licensed family child care programs and child care centers (including those with national accreditation), Head Start programs, and school-based prekindergarten programs. Approximately two-thirds of the children in the study are from low-income families (with incomes at or below 185% of the federal poverty level).

The findings address the effectiveness of the rating tool overall, the Accelerated Pathway to Rating process offering a Four-Star rating for programs that meet external quality standards aligned with Parent Aware, and the rating process for different program types.

- Results of analyses on observed program quality and children's development provide positive support for the validity of the Parent Aware ratings in supporting meaningful quality differences that are related to children's development in expected ways.

- Overall, the Accelerated Pathway to Rating (APR) process appears to function effectively to identify programs that engage in practices to support school readiness, particularly for low-income children. APR Four-Star programs and Three- and Four-Star fully-rated programs both engage in quality practices, according to the observational data and findings on children's development.

- Prior to receiving their rating, Three- and Four-Star fully rated center-based programs are eligible to receive coaching on the Classroom Assessment and Scoring System (CLASS), a tool that emphasizes the quality of teacher-child interactions. These programs had higher scores on the Instructional Support dimension of the CLASS, a finding which demonstrates the potential benefits of investments in coaching to support improvement in practices that promote children's school readiness.

- Children in Parent Aware-rated programs made gains from fall to spring of their pre-kindergarten year on skills that are critical for their school readiness: math skills, language and literacy skills, social competence, persistence and executive function. Gains in language and literacy and executive function were greater for children from low-income families than for children from higher-income families, though spring scores for low-income children were still equal to or lower than fall scores for higher-income children.

- Further research is needed to identify gaps and opportunities for strengthening the rating process and incentive structure for family child care programs.

The results of the initial validation study are limited to 3- and 4-year-old preschool children. Future research should address the experiences of infants and toddlers in Parent Aware-rated programs. In addition, the study was conducted early in Parent Aware statewide implementation (primarily 2013-2015). Enrollment of programs and children in the study reflected program participation in Parent Aware at the time the study was conducted; it is expected that patterns of program participation will change over time and will include a greater proportion of programs in the full rating pathway.

Overall, the results of the initial validation study suggest that Parent Aware has integrity as a framework for building and connecting efforts to support all types of early care and education programs in Minnesota. The findings can be used to refine the system and to chart a course for the future. Ongoing monitoring and evaluation should be conducted to support continuous improvement and to ensure that Parent Aware is achieving its goals for Minnesota's children and families.

Executive Summary

Parent Aware is Minnesota's voluntary Quality Rating and Improvement System (QRIS) for early care and education (ECE) programs. In 2015, Parent Aware became available statewide after a gradual rollout that began in 2012 with the support of Minnesota's Race to the Top – Early Learning Challenge (RTT-ELC) grant and quality funds from the Child Care and Development Fund.[1] The primary goal of Parent Aware is to improve young children's school readiness by helping families "identify programs using the practices that best prepare children for kindergarten" and by providing improvement resources to participating programs.[2]

The Parent Aware evaluation tracks the implementation and outcomes of Parent Aware and is designed to provide research results that inform continuous improvement of the system. The purpose of this Initial Validation Report is to describe the extent to which the Parent Aware rating process is producing ratings that meet interrelated criteria for being fair, accurate, and meaningful.

- QRIS ratings that are *fair* are produced from a reliable, equitable process.
- QRIS ratings that are *accurate* reflect and distinguish the quality of services available to children and families in the program. For example, the environment, interactions and experiences of children and parents in programs with a high rating (at the top level of the QRIS) should be of higher quality – and visibly different – than those in programs with a low rating (at the lowest level of the QRIS).
- QRIS ratings that are *meaningful* measure and promote the elements of quality that link to the outcomes targeted by the QRIS. Because QRIS aim ultimately to support the positive development of young children, meaningful ratings should be comprised of quality indicators that have been shown through research to support children's language and literacy skills, early math skills, and social-emotional development.

Addressing the question of QRIS validity is a critical step when using ratings for accountability and improvement initiatives. Indeed, the RTT-ELC grant required that state grant recipients conduct an independent validation of their QRIS.

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[1] Minnesota's Race to the Top – Early Learning Challenge (RTT-ELC) grant was $44.86 million. It was awarded by the U.S. Department of Education.

[2] See parentaware.org and parentawareratings.org for information about Parent Aware.

Parent Aware at a Glance

What is Parent Aware?
Parent Aware is Minnesota's Quality Rating Improvement System (QRIS) for early care and education programs. It is available to all licensed child care centers and family child care providers, Head Start and Early Head Start programs, school-based pre-kindergarten programs and Early Childhood Special Education programs.

How do programs receive a rating?
Parent Aware has two rating pathways. Licensed, non-accredited child care centers and family child care providers rated under the *full-rating* pathway submit program documentation in four areas of quality.
- Physical Health and Well-Being
- Teaching and Relationships
- Assessment of Child Progress
- Teacher Training and Education

Reliable raters review documentation and award a One- to Four-Star Rating. Parent Aware requires that programs meet all quality indicators at the One- and Two-Star levels before being able to achieve a Three- or Four-Star Rating. Center-based programs aiming for a Three- or Four-Star Rating receive a preschool classroom observation using the Classroom Assessment Scoring System (CLASS). Programs eligible for the full-rating process participate in a rating cohort. Ratings earned under the full-rating process are awarded two times per year: June 30th and December 31st.

A second option for rating is the *Accelerated Pathway to Rating (APR)* process. Accredited child care centers, accredited family child care providers, Head Start, Early Head Start, Early Childhood Special Education, and school-based pre-kindergarten programs are eligible for the APR process and can apply for a Parent Aware rating at any time during the year. Because the quality standards for these programs are aligned with Parent Aware standards, APR programs are eligible for a Four-Star rating after submitting documentation on indicators related to curriculum and assessment.

What is the timeline for statewide expansion of Parent Aware?
As of January 1, 2015, Parent Aware is available statewide. Programs eligible for APR have been eligible to enroll since 2012. For all other types of programs - licensed, non-accredited child care centers and family child care providers - Parent Aware began a gradual rollout in 2012. In 2013, Parent Aware was available to licensed, non-accredited programs in 22 counties and on seven reservations. In 2014, Parent Aware rolled out to an additional 23 Minnesota counties and one additional reservation. Programs in the remaining 42 counties were eligible to participate in 2015.

What supports do programs receive as part of Parent Aware?
Fully-rated programs receive support from a Quality Coach who helps assess quality needs and assists with assembling the documentation needed to apply for a rating. CLASS coaching is also available. Programs eligible for Building Quality (a pre-rating support process) receive $500 in pre-rating quality improvement supports, additional time to prepare for the rating, and additional coaching time. Programs that earn a One-, Two-, or Three-Star Rating receive up to $1,000 in post-rating quality improvement supports. After being rated, a program also receives marketing materials to promote the rating.

How do parents learn about Parent Aware Ratings?
When a program earns a Star rating, it is posted at parentaware.org, a statewide search engine. Parents can search for rated (and non-rated) programs in their area using a variety of search criteria.

What information has been learned about Parent Aware?
Evaluation reports have been produced by Child Trends for each year of the statewide expansion. Reports are available at http://www.pasrmn.org/work/research.

Initial Validation Findings in Brief

The validation study analyzes multiple sources of evidence including observations of quality in 325 Parent Aware-rated programs and direct assessments of developmental skills in nearly 1,200 children in both the fall and spring of their year before kindergarten. The study was conducted with all program types participating in Parent Aware: licensed family child care programs and child care centers (including those with national accreditation), Head Start programs, and school-based prekindergarten programs. Approximately two-thirds of the children in the study are from low-income families (with incomes at or below 185% of the federal poverty level).

The findings address the effectiveness of the rating tool overall, the Accelerated Pathway to Rating process offering a Four-Star rating for programs that meet external quality standards aligned with Parent Aware, and the rating process for different program types.

- Results of analyses on observed program quality and children's development provide positive support for the validity of the Parent Aware ratings in supporting meaningful quality differences that are related to children's development in expected ways.

- Overall, the Accelerated Pathway to Rating (APR) process appears to function effectively to identify programs that engage in practices to support school readiness, particularly for low-income children. APR Four-Star programs and Three- and Four-Star fully-rated programs both engage in quality practices, according to the observational data and findings on children's development.

- Prior to receiving their rating, Three- and Four-Star fully rated child care centers are eligible to receive coaching on the Classroom Assessment Scoring System (CLASS), a tool that emphasizes the quality of teacher-child interactions. These programs had higher scores on the Instructional Support dimension of the CLASS, a finding which demonstrates the potential benefits of investments in coaching to support improvement in practices that support children's school readiness.

- Children in Parent Aware-rated programs made gains from fall to spring of their pre-kindergarten year on skills that are critical for their school readiness: math skills, language and literacy skills, social competence, persistence, and executive function. Gains in language and literacy and executive function were greater for children from low-income families than for children from higher-income families, though spring scores for low-income children were still equal to or lower than fall scores for higher-income children.

- Further research is needed to identify gaps and opportunities for strengthening the rating process and incentive structure for family child care programs.

The initial validation study has limitations that should be considered when reviewing the findings. The results of the study are limited to 3- and 4-year old preschool children. Future research should address the experiences of infants and toddlers in Parent Aware-rated programs. In addition, the study was conducted early in Parent Aware statewide implementation (primarily 2013-2015). Enrollment of programs and children in the study reflected program participation in Parent Aware at the time the study was conducted; it is expected that patterns of program participation will change over time and will include a greater proportion of programs in the full-rating pathway.

Overall, the results of the initial validation study suggest that Parent Aware has integrity as a framework for building and connecting efforts to support all types of early care and education programs in Minnesota. The findings can be used to refine the system and to chart a course for the future. Ongoing monitoring and evaluation should be conducted to support continuous improvement and to ensure that Parent Aware is achieving its goals for Minnesota's children and families.

Background on QRIS Validation

Though state QRIS were first developed in the late 1990's, the growth in new systems was greatest in the last five years (from 22 to 40; QRIS Compendium, 2015). Since 2011, many existing QRIS underwent redesign or revisions in response to new requirements from RTT-ELC (for example, to incorporate quality indicators related to health and to include more early care and education program types such as Head Start and state pre-kindergarten programs). Thus, QRIS are still relatively new as a policy framework for supporting quality improvement in early care and education settings. Research can play an important role in supporting design and revision of QRIS (Tout, 2013).

To date, the limited research on QRIS validation nationally has produced mixed results. A recent literature review that includes findings from the pilot of Parent Aware and 11 other QRIS evaluations indicates that higher scores on the Environment Rating Scales (which measure global quality) are found in programs with higher ratings; however, most of the QRIS include scores from the Environment Rating Scales in the rating which may inflate the results (Karoly, 2014). Among four studies with strong research designs, two documented linkages between children's development and QRIS ratings. Thus, there is a pressing need to build the literature with information about how QRIS ratings are functioning in practice and how ratings are associated with children's development. The current study was conducted in part to fill this gap.

Early care and education researchers have defined QRIS validation as a multi-step process, not a construct that can be addressed fully with only one study or one analysis (Zellman & Fiene, 2012). In Minnesota, we addressed the question of validation through a series of activities launched in parallel with implementation of statewide Parent Aware expansion. Some of the activities are research activities conducted by Child Trends and other activities are conducted by the Statewide Parent Aware Coordination Framework as part of their management of Parent Aware.

- To address whether Parent Aware ratings are fair, Child Trends has analyzed the quality indicators in the rating scale to understand scoring patterns and whether certain indicators are more or less likely to be met by programs.[3] Child Trends has also tracked provider perceptions of Parent Aware and the implications for improving access and enrollment in Parent Aware.[4] Through analysis of Develop (the data system that supports Parent Aware),[5] the Minnesota Department of Human Services (DHS) tracks participation in Parent Aware on a quarterly basis (looking across program type and state geography) and analyzes the extent to which children with high-needs are being served in rated programs. In addition, DHS has developed protocols to assess whether reliability of the rating process is established and maintained over time.
- To address whether Parent Aware ratings are accurate, Child Trends analyzed whether scores on measures of observed quality differ by program ratings.[6] We also analyzed whether accuracy of the ratings differs by the rating pathway programs use to enter Parent Aware (the full-rating or the Accelerated Pathway to Rating).
- To address whether Parent Aware ratings are meaningful, Child Trends and DHS conducted an evidence review to document the research base supporting each quality indicator.[7] In addition, Child Trends conducted extensive data collection and analysis to examine how Parent Aware ratings are related to measures of children's

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[3] For more information, see the Year 2 and Year 3 reports conducted by the Parent Aware Evaluation team (available at http://www.pasrmn.org/work/research). Findings were also shared in an internal memo submitted to the Department of Human Services.

[4] For more information, see the provider perception reports (available at http://www.pasrmn.org/work/research).

[5] Information about Develop is available at: http://www.developtoolmn.org/. In addition, see the Year 3 Parent Aware Evaluation Report for details: http://tinyurl.com/nw2qc8z.

[6] Due to the unequal distribution of Parent Aware-rated programs across each of the four rating levels, One- and Two-Star rated program data were collapsed to comprise the "lower quality" group. Three- and Four-Star rated program data were collapsed to comprise the "higher quality" group.

[7] The evidence review is an unpublished document that was developed to provide support for internal discussions and decision-making.

development, including their language and literacy skills, math skills, and socio-emotional development. Because a Parent Aware rating is intended to identify early care and education programs that are effectively supporting children's development, especially those children with risk factors that make them vulnerable to poor school outcomes, the analyses also consider the developmental progress of children from low-income families.

A QRIS validation process considers multiple sources of evidence and does not produce a yes/no designation of validity (Zellman & Fiene, 2012). In Minnesota, the Parent Aware validation process has been conducted with the input of Parent Aware stakeholders and a Technical Expert Panel to produce information that can contribute to continuous improvement of Parent Aware.

Table ES1 provides an overview of validation questions, sources of evidence, hypotheses, and key findings from the validation study.

Table ES1. Parent Aware validation questions, sources of evidence, hypotheses and validation findings

Key Questions for Validation of Parent Aware	Source of Evidence	Hypothesis	Key Findings
Are the Parent Aware quality indicators consistent with the evidence base on early care and education program quality?	Evidence review[8]	The Parent Aware quality indicators are based on research and best practice according to professional guidelines.	Yes. The evidence base for the Parent Aware indicators is solid, particularly for quality indicators supporting teacher-child interaction and the implementation of curriculum and assessment practices. Support for indicators related to specific training content is less strong.
Do programs seeking full ratings gain points on Parent Aware indicators in expected ways (i.e.,	Analysis of indicators[9] Provider reports of goal ratings[10]	Programs achieve points in each of the quality areas (Physical Health and Well-Being,	No. Programs are selective in the goal ratings they set and the indicators they pursue for a Parent Aware rating. Programs may set a lower goal rating than they could otherwise achieve because they want to work through each

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[8] The evidence review was conducted collaboratively by Child Trends and the Minnesota Department of Human Services. It is an unpublished document intended to support decision-making.

[9] The indicator analysis was conducted in a separate report and is not included in detail here. Further information is available in the Year 2 and Year 3 reports conducted by the Parent Aware Evaluation team (available at http://www.pasrmn.org/work/research).

Key Questions for Validation of Parent Aware	Source of Evidence	Hypothesis	Key Findings
showing that they are working on quality indicators across different aspects of quality)?		Teaching and Relationships, Assessment of Child Progress, and Teacher Training and Education) to work toward a Four-Star rating.	level of Parent Aware incrementally, either to provide feasible, attainable goals for their program or to access the maximum amount of quality improvement grants. The implication of this finding is that the lower rating levels of Parent Aware are likely to have greater variation in quality than the higher levels. This variation is expected to diminish over time. Indicators related to assessment and the director's credential are the most likely to be unmet or undocumented (meaning that a program did not attempt to be verified on those indicators). Programs are most likely to achieve all points on the Physical Health and Well-Being indicators.
Do aspects of observed quality differ in programs with higher ratings?	Observations of program quality	Scores on measures of global quality, teacher-child interactions and practices related to math, literacy, and individualized teaching will be higher in programs with higher ratings.	Yes. Observed quality differs in center-based programs[11] with higher ratings. Global quality scores were higher, and specific practices related to math, literacy, and individualized teaching occurred more frequently in higher-rated programs than in lower-rated programs. No differences in observed quality were found for family child care programs at higher and lower quality levels.
Do measures of observed quality relate in predicted ways to patterns of children's	Observations of program quality and assessments of children's	Observed quality scores will also be associated positively with	Yes, on select measures. Measures of global quality were related to language development of low-income children. Specific literacy practices were related to gains in expressive vocabulary and social

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[10] See Year 2 Provider perception report available at: http://www.pasrmn.org/work/research.

[11] "Center-based programs" is a general term to refer to child care centers, Head Start programs and school-based prekindergarten programs.

Key Questions for Validation of Parent Aware	Source of Evidence	Hypothesis	Key Findings
development?	development	children's developmental growth.	competence. CLASS instructional support was related to gains in executive function. Each of these quality practices was observed to be occurring at higher levels in programs with higher ratings.
Do patterns of children's developmental gains from fall to spring in the year before Kindergarten align with Parent Aware ratings?	Assessments of children's development	Children in programs with higher ratings will show greater gains in developmental skills than children in programs with lower ratings.	Yes. Children attending higher-rated programs made greater gains from fall to spring of their pre-kindergarten year on social competence and attention/persistence, a measure of children's approach to learning. In addition, low-income children attending higher-rated programs made greater gains on a measure of literacy (print knowledge) and social competence. Though findings linking children's development and Parent Aware ratings were not pervasive across every outcome examined, associations in the expected direction were noted on three of the five developmental domains examined (language and literacy, social-emotional development, and approaches to learning).
Do patterns of findings with observed quality and children's development look similar for programs with a Three- or Four-Star full-rating and programs with an Accelerated Pathway to Rating?	Rating data, by pathway status	Associations with observed quality and children's development will look similar for programs, regardless of rating pathway.	The findings were mixed. Differences by rating Pathway were observed. On balance however, the differences were not systematic and indicate that the APR process is producing ratings that are functionally equivalent to full-ratings. CLASS Instructional Support scores are higher in Three- and Four-Star rated programs than in other fully-rated and APR programs, except Head Start. School-based programs and Head Start programs had significantly higher scores than other programs on specific literacy and math practices. Thus, some findings favor fully-rated programs and others favor APR programs.

Source: Child Trends' analysis

Key Findings and Implications

Patterns of Children's Development

The Parent Aware validation study offers a unique opportunity to observe patterns of development in a large sample of children from across Minnesota. Though the sample was not designed to be representative of all children, it includes children from a variety of early care and education programs and a high proportion of children from low-income families. Both sample features are important for informing policy decisions about Minnesota's early care and education system.

The analysis focused on the extent to which children showed improvements over time on developmentally appropriate assessments of their skills. This strategy acknowledges that children have different starting points and thus may grow and change on the assessments at different rates. For children who start behind their peers, it is helpful to track whether they are able to make up ground and approach national averages on assessments during the course of the year before kindergarten.

Key findings about child development include:

- Children in Parent Aware-rated programs made gains from fall to spring of their pre-kindergarten year on skills that are critical for their school readiness: math skills, language and literacy skills, social competence, persistence, and executive function. Gains in language and literacy and executive function were greater for children from low-income families than for children from higher-income families, though spring scores for low-income children were still equal to or lower than fall scores for higher-income children.
- Low-income children scored significantly lower on a composite measure of basic concepts such as understanding of color, size, and counting (administered in the spring only). Low-income children also were more likely to be either over- or under-weight than the sample of children from higher-income families.

The findings on children's development are both encouraging and a source of concern. Even though the time between fall and spring assessments is quite short, children in Parent Aware programs are making significant gains on key skills. Across the sample, children from low- and higher-income families are at or above the national averages on measures of math and language skills. The gap in assessment scores by family income, however, is of concern, and the results of the basic concepts screener and weight category screener indicate that greater supports are needed for children from low-income families. Parent Aware can be used as a foundation for providing additional resources to Parent Aware

programs serving low-income children. These supports may include training and coaching that promotes more effective individualizing of instruction and interactions. In addition, supports for children's health and development may be enhanced through sustained coordination with Child Care Health Consultants (a service which is available currently through RTT-ELC grant funds).

Observed Quality in Parent Aware Rated Programs

Ratings that are *accurate* reflect and distinguish the quality of services available to children and families in the program. For the Parent Aware validation analyses, we hypothesized that the learning environment, interactions, and experiences of children in programs with a high rating would look different from those in programs with a low rating.

Key findings about observed quality include:

- On four of the seven measures of observed quality examined, center-based programs with higher Star ratings– those with Three- and Four-Star ratings – demonstrated higher scores than programs with lower ratings– those with One- and Two-Star ratings. The differences were noted on a measure of global quality (the ECERS-R, which includes the learning environment and provisions for children's daily routines and activities) and measures of specific practices to support children's math, literacy, and individualized learning (the ECERS-E). No differences between rating levels were found on the CLASS domains which assess the quality of teacher-child interactions. These findings provide initial support for the validity of the ratings. We conclude that Parent Aware is functioning to differentiate quality in center-based programs. At this early stage of implementation, major changes to the process for determining ratings levels are not warranted by the validation findings for center-based programs, though the magnitude of observed quality differences is small.
- No differences between programs by Star rating level were noted for family child care programs on the four measures we examined. The measures include a global quality measure (the FCCERS-R, which is similar to the ECERS-R but is tailored for family child care programs and measures the learning environment and provisions for children's routines and activities) and the measures of specific practices to support math, literacy, and individualized learning (the ECERS-E).

A number of explanations are possible for the lack of differentiation among quality levels for family child care programs. First, the sample sizes for family child care programs in the evaluation were lower than desired. It is possible that the sample represented a select group of family child care programs that was willing to participate in the evaluation, but

was not necessarily representative of other family child care programs in Parent Aware (among which a greater diversity of observed quality may have been evident). Alternatively, evidence from other evaluation activities (including analyses of provider perceptions of Parent Aware; see Child Trends, 2014) suggests that family child care providers may have chosen to work incrementally through the Parent Aware rating levels, even though they may have been able to achieve a higher Star rating. They may have wanted to access the financial incentives associated with achieving each rating level, or they may have chosen to set goals that could be met more feasibly within the rating timeframe (rather than tackle the multiple indicators at the highest rating level). In either scenario, we would expect to see less differentiation across the quality levels since the group with lower ratings includes those who are able to meet higher quality indicators, but are choosing instead to work through the rating process at a slower pace. Over time, the quality levels may be more differentiated as those programs move to higher Parent Aware levels.

Even with plausible explanations for the lack of differentiation among family child care quality levels, it is important to consider options for strengthening Parent Aware ratings for family child care programs. These strategies could include collection of on-site observations, similar to the rating process used for child care centers seeking a Three- or Four-Star rating. However, given the cost of implementing observations in family child care programs as part of the rating process,[12] a field test could be conducted first to examine the effectiveness of different options and measures. The availability of measures to capture quality in family child care programs is limited. It will be useful to confer with other states and review the results of forthcoming validation studies to learn about the functioning of different measures in family child care programs. Some states are using the FCCERS-S in family child care programs while others (Oregon, for example) are using a modified CLASS protocol (which is typically used only in center-based programs) in family child care programs. Different sources of evidence could be examined to inform this important decision.

Linkages between Ratings, Observed Quality and Children's Development

Ratings that are *meaningful* measure and promote the elements of quality that link to the outcomes targeted by the QRIS. Because Parent Aware aims ultimately to support the positive development of young children, it is important to examine whether and how ratings – and the quality promoted by the ratings – are associated with children's developmental outcomes.

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[12] For details about cost estimates, see The Parent Aware Quality Rating and Improvement System: Increasing Accessibility for Families and Early Care and Education Programs (pages 28-29) available at: https://mn.gov/dhs/images/Parent_Aware_Accessibility_Report.pdf

Key findings about ratings, observed quality and children's development include:

- Children attending higher-rated programs made greater gains from fall to spring of their pre-kindergarten year on social competence and attention/persistence, a measure of children's approach to learning. In addition, low-income children attending higher-rated programs made greater gains on a measure of literacy (print knowledge) and social competence. Though findings linking children's development and Parent Aware ratings were not pervasive across every outcome examined, associations in the expected direction were noted on three of the five developmental domains examined (language and literacy, social-emotional development, and approaches to learning).
- Further exploration of observed quality and children's development indicated positive associations though we note that there were relatively few significant findings given the number of models tested. The following associations were noted:
  - CLASS Instructional Support was associated with growth on executive function.
  - Global quality scores in center-based programs (ECERS-R) were associated with gains on language skills (print knowledge and phonological awareness) for low-income children. And, higher rated programs scored higher on the ECERS-R than lower rated programs.
  - ECERS-E literacy practices were related to gains in expressive vocabulary. And higher rated programs had higher ECERS-E literacy scores than lower rated programs.
- Thus, while the models examining ratings and child development showed only one linkage in the domain of language and literacy development (with low-income children gaining more on print knowledge in higher quality programs), the analysis of observed quality provides initial indications that practices engaged in by programs at higher rating levels were positively associated with all three measures of children's language development.

Taken together, the findings provide positive, initial support for the validity of the Parent Aware ratings in supporting meaningful quality differences that are related to children's development in expected ways.

Parent Aware Rating Pathways

Ratings that are *fair* are produced from a reliable, equitable process. Because Parent Aware provides two enrollment pathways for programs, it is important to examine the extent to which these pathways are producing ratings that are functionally equivalent. Licensed, non-accredited child care centers and family child care programs enroll in the full-rating

pathway and receive a One- to Four-Star rating. Accredited programs, Head Start/Early Head Start programs and school-based pre-kindergarten programs are eligible to enroll in the Accelerated Pathway to Ratings (APR) process that has fewer quality indicators and does not include an on-site observation. The APR process results in a Four-Star rating. The validation study examined observed quality and children's development by rating pathway.

The analyses presented by rating pathway (for center-based programs) provide important insights into similarities and differences between programs and have implications for assessing the effectiveness of the APR process.

Key findings on rating pathways include:

- On global quality, Three- and Four-Star fully-rated programs and APR programs had nearly identical scores, and both scored higher than One- and Two-Star rated programs on the ECERS-R. This finding on global quality held when APR programs were analyzed by program type (accredited center-based programs, Head Start and school-based pre-kindergarten programs).
- On the other aspects of observed quality, differences emerged among higher rated programs with full-ratings and APR ratings. Three and Four-Star rated child care centers program had higher scores on Instructional Support than all other program types except Head Start. Notably, Three- and Four-Star fully-rated child care centers and Head Start programs are likely more knowledgeable about the CLASS tool than other program types because it is part of their program requirements: Fully-rated Three- and Four-Star centers receive a CLASS observation and CLASS coaching as part of the Parent Aware rating process while Head Start programs learn about the CLASS because of its role in the Head Start Designation Renewal process. From the perspective of the early care and education system, it makes sense that these programs are distinct from others on their CLASS Instructional Support scores (though note that Head Start scores were not significantly higher than One- and Two-Star programs or any other APR program type). Accredited programs and school-based pre-kindergarten programs did not score higher on the CLASS domains than One- and Two-Star rated programs.
- On Planning for Children's Individualized Needs, APR programs and Three- and Four-Star fully-rated programs scored higher than One- and Two-Star programs. On Literacy and Math practices, APR programs overall had higher scores than One- and Two-Star rated programs and Three- and Four-Star rated programs. Head Start and school-based programs had significantly higher scores on literacy and math than other program types, and Head Start scored higher than other program types on planning for individualized needs.

- The findings on children's development and rating pathways clarified and extended the findings on ratings and children's development. For example, the models revealed that gains in children's social competence are associated with their participation in APR programs, especially Head Start and school based programs. Language and literacy gains across all three measures examined were associated with participation in Head Start programs.

Overall, the Accelerated Pathway to Rating appears to function effectively to identify programs that engage in practices to support school readiness, particularly for low-income children. APR programs and Three- and Four-Star rated programs both have strengths, according to the observational data and findings on children's development. On balance, the differences between rating pathways are not systematic; on some measures, the differences favor APR programs, and on other measures the differences favor fully-rated programs. The differences noted by program type across the APR programs suggest that there are strengths in Head Start and school-based pre-kindergarten programs compared to accredited centers and Three-Star and Four-Star rated centers. These differences, however, are not of sufficient magnitude to indicate that different tiers of quality exist within APR programs. For example, the average scores on the quality measures examined in this study – even when programs are examined by rating level – are not in the highest range for the measures identified by the developers (scores above a 5 on the ECERS-R and ECERS-E, and scores above a 3 on the CLASS Instructional Support domain). If the measures were used in professional development efforts and incorporated more fully into the early care and education system as quality improvement tools, scores may improve over time.

Similarly, the findings do not indicate that APR programs would be differentiated more successfully by requiring a full-rating process with the current set of Parent Aware indicators. If specific strategies were put in place to address and improve quality in APR programs or to target different quality practices, it may make sense to incorporate a rating process that is not "accelerated" and that could potentially capture resulting quality differences among APR programs (perhaps identifying programs that exceed the requirements at the highest rating level). However, without targeted quality improvement approaches in place for APR programs or new Parent Aware rating criteria specifying advanced practices and interactions (such as the literacy, math and individualized teaching practices observed in this study), the investment in additional rating criteria for these programs may not be warranted.

The findings do indicate that across all quality levels, program types and rating pathways, programs in Parent Aware, including those that have achieved a Three- or Four-Star full-rating and APR programs, could benefit from quality improvement efforts. In particular,

average scores on Instructional Support, specific math and literacy practices and planning for individualized needs are in the low range (though they are consistent with the scores documented in other national studies). Investments in improvement strategies to strengthen these practices could support changes in practices that are likely to bolster children's development.

Coaching to help teachers and caregivers improve their practices with children is a promising quality improvement strategy to promote in Parent Aware. The validation study provides evidence to suggest that the CLASS coaching received by center-based programs seeking a Three- or Four-Star rating is supporting higher scores on CLASS Instructional Support. CLASS coaching is not provided to family child care programs or to programs in the APR pathway. Expanding CLASS coaching to these programs may be valuable, even if CLASS scores are not included in their rating. CLASS coaching (or other coaching to support teaching practices) could be made available to programs as part of a continuous quality improvement process through which programs develop improvement plans and action steps that are supported by coaches and/or participation in training but are not included in the rating process.

Limitations of the Validation Study

In reviewing the validation results in this report, it is important to consider the context of Parent Aware implementation from the fall of 2013 through the summer of 2015 when the bulk of data collection occurred for the analyses presented. At that time, Parent Aware was in its second and third year of statewide expansion. Implementation research conducted for the Year 1 and Year 2 evaluation reports indicates that Parent Aware policies, procedures and rating processes were still being refined (Tout et al, 2013). Thus, minor inconsistencies in the rating process are likely and may indicate that ratings in the early years of Parent Aware are less reliable than those being issued later when policies and procedures became more standardized. These potential concerns should be factored in when interpreting the results.

In addition, the analyses in this report focus on the experiences of children in the year before they enter kindergarten. Though Parent Aware is open to programs serving children beginning at birth, resource limitations for the validation study did not permit inclusion of infants and toddlers. Future work should focus on addressing the extent to which the Parent Aware ratings are capturing the features of quality that support the positive development of infants and toddlers. Similarly, children with special needs and children

who could not be assessed using tools administered in English[13] are not included in the study. Efforts to understand the experience of these children in Parent Aware programs should be included in future research.

In addition, sample sizes were limited for certain types of programs. In particular, the sample size of fully-rated family child care programs is relatively small compared to the number of programs included in the APR sample. Though these numbers represented the distribution of programs in Parent Aware during the time of recruitment for the evaluation, family child programs in 2015 are the most rapidly growing program type in Parent Aware. If resources are available to support further evaluation, it will be important to conduct additional observations in family child care programs that represent the full range of programs now rated in Parent Aware.

Conclusion

Overall, the results of the validation study suggest that Parent Aware has integrity as a framework for building and connecting efforts to support all types of early care and education programs in Minnesota. The findings can be used to refine the system and to chart a course for the future. Ongoing monitoring and evaluation should be conducted to support continuous improvement and to ensure that Parent Aware is achieving its goals for Minnesota's children and families.

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[13] Fewer than 20 of the recruited children were not assessed in this study because of low English proficiency. However, we anticipate that greater numbers of children speaking languages other than English will participate in Parent Aware-rated programs over time and should be included in evaluation efforts.

Overview and Purpose of Report

Parent Aware is Minnesota's Quality Rating and Improvement System (QRIS) for early care and education (ECE) programs. In 2015, Parent Aware became available statewide after a gradual rollout that began in 2012 with the support of Minnesota's Race to the Top – Early Learning Challenge grant. The primary goal of Parent Aware is to improve young children's school readiness by helping families "identify programs using the practices that best prepare children for kindergarten" and by providing improvement resources to participating programs.[14]

The Parent Aware Evaluation tracks the implementation and outcomes of Parent Aware and is designed to provide research results that inform continuous improvement of the system. The purpose of this Initial Validation Report is to describe the extent to which the Parent Aware rating process is producing ratings that are functioning as intended and distinguishing meaningful levels of quality.

The report is divided into seven sections:

- Section 1. Parent Aware Description includes a description of Parent Aware including an overview of its administration and the rating process.
- Section 2. Parent Aware Validation provides an overview of QRIS validation and how it is being assessed in this report.
- Section 3. Programs and Children in the Parent Aware Evaluation contains details about the programs and children participating in the Parent Aware Evaluation.
- Section 4. Observed Quality and Parent Aware Ratings provides the results of analyses to understand whether features of observed quality differ in programs with low and high Parent Aware ratings.
- Section 5. Children's Development and Parent Aware Ratings provides the results of analyses to understand how patterns of children's development differ in programs with low and high Parent Aware ratings.
- Section 6. Parent Aware Rating Pathways presents analysis of observed quality and children's development by Parent Aware rating pathway.
- Section 7. Putting the Findings in Context summarizes key findings and offers implications and recommendations.

Appendices are available that outline the Parent Aware Indicators and Scoring (Appendix A: Parent Aware Indicators and Scoring Criteria for Child Care Centers and Family Child Care), recruitment and sampling procedures (Appendix B: Sampling, Recruitment, and Data

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[14] See parentaware.org and parentawareratings.org for information about Parent Aware.

Collection Methods), data sources for the evaluation (Appendix C: Data Sources), details about data and analytic methods (Appendix D: Details about Data and Analytic Methods), and tables displaying the hierarchical linear models used in analyses (Appendix E: Summary of HLM Analyses).

Section 1. Parent Aware Description

After being implemented as a pilot program from 2007-2011, Parent Aware began statewide expansion in January 2012 with funding from Minnesota's Race to the Top – Early Learning Challenge (RTT-ELC) grant awarded at the end of 2011.[15] Approximately $8.9 million dollars is allocated for Parent Aware from the RTT-ELC grant for the grant period along with an annual commitment of $2.5 million in federal Child Care Development Fund quality funds.[16] In addition, private and local investment in Parent Aware - both through provisions to support quality improvement and building the Parent Aware infrastructure throughout Minnesota - is over $11 million since statewide rollout began in 2012. As of January 2015, Parent Aware is available in all counties in Minnesota.

The RTT-ELC grant provides a primary context for Parent Aware implementation as Minnesota works to achieve the goals outlined in the grant application of creating a sustainable, high quality system that supports children's development, particularly those living in poverty.[17] The goals in RTT-ELC related to Parent Aware include targets for program enrollment and ratings and specify that children with high-needs will be served increasingly in high quality (highly rated) programs.[18] As required by the RTT-ELC grant, Minnesota's plan for Parent Aware also includes a schedule and framework for assessing and revising the Parent Aware indicators and for analyzing the validity of the Parent Aware rating tool. The Parent Aware Evaluation is being conducted to meet the RTT-ELC requirements and to inform continuous improvement of Parent Aware.

Parent Aware Administration and Partners

The Minnesota Department of Human Services (DHS) has primary responsibility for administering Parent Aware. DHS contracts with Child Care Aware of Minnesota to manage and coordinate Parent Aware recruitment, quality improvement services, and communications for licensed child care programs. The Minnesota Department of Education (MDE) is responsible for recruiting and communicating with Head Start, Early Head Start,

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[15] Evaluation reports from the Parent Aware pilot are available at:
http://www.pasrmn.org/MELF/Parent_Aware_Pilot_Research

[16] Funding levels provided by the Minnesota Department of Human Services. Progress and budgets for Minnesota's Race to the Top – Early Learning Challenge Grant are available at:
http://www2.ed.gov/programs/racetothetop-earlylearningchallenge/2014apr/mnapr2014.pdf

[17] The RTT-ELC grant is managed by the Minnesota Department of Education.

[18] Children with high-needs are defined in the RTT-ELC grant as children from low-income families or children with disabilities or developmental delays, who are English learners, who reside on Indian lands, who are migrant, homeless or in foster care, or have some other characteristics defined by the State.

Early Childhood Special Education, and school-based pre-kindergarten programs meeting School Readiness program requirements (a program run by school districts and offered to children ages three through five and meeting eligibility requirements defined by Minnesota Statutes 124D.15).[19] Local Child Care Aware agencies conduct recruitment and offer the services of Quality Coaches, CLASS Coaches, Professional Development Advisors, and Grants Administrators to licensed child care centers and family child care programs. The Center for Early Education and Development (CEED) at the University of Minnesota is contracted to conduct observations for non-accredited licensed child care centers seeking Three- or Four-Star ratings. All information to determine ratings for licensed child care centers and family child care programs (including accredited child care centers and accredited family child care programs) is sent to the Department of Human Services where staff contracted through Child Care Aware of Minnesota perform the scoring. All information to determine ratings for school-based pre-kindergarten programs, Head Start, Early Head Start, and Early Childhood Special Education programs is sent to MDE. Child Care Aware of Minnesota and MDE make the initial determinations and recommendations for rating level, and DHS issues the final ratings.

Implementation of Parent Aware involves several additional partners:

- Parent Aware for School Readiness (PASR) is a nonprofit organization with a mission to "promote and protect" Parent Aware ratings by supporting marketing and communications activities and by funding evaluation of Parent Aware.
- Greater Twin Cities United Way supports the Child Care Accreditation Project (CAP) at the Minnesota Association for the Education of Young Children (MnAEYC). CAP provides consultation, training, support, and reimbursement of fees for programs located in the Twin Cities' nine-county metropolitan area seeking national accreditation. Programs with national accreditation are eligible for the Accelerated Pathway to Rating process. Greater Twin Cities United Way also provides funding for evaluation of Parent Aware.
- The Minnesota Licensed Family Child Care Association, with funding from DHS, provides supports for accreditation of family child care programs.
- First Children's Finance, with funding from DHS, offers training and supports on business development and practices for Parent Aware participants.
- The Center for Inclusive Child Care, with funding from DHS, offers coaching to Parent Aware participants on best practices in caring for children with special needs.

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[19] Throughout the report, these programs will be referred to as school-based pre-kindergarten programs.

- The Minnesota Center for Professional Development, with funding from DHS, provides technical and operational support for the professional development features in Develop, Minnesota's Quality Improvement and Registry Tool. Develop also supports an online application process for programs participating in Parent Aware.

The Parent Aware Rating Process

Programs that are interested in Parent Aware have different options for enrollment to receive a full-rating. Licensed, non-accredited child care centers and family child care programs that serve children with high-needs are eligible to enroll in Building Quality, a six-month process that prepares programs for entering Parent Aware. The Building Quality pre-rating support process offers the coaching services of a Quality Coach, a Professional Development Advisor who assists with professional development planning, quality improvement funds (up to $500), and access to low-cost training.

Programs not eligible for or interested in Building Quality supports enroll directly into Parent Aware. They also receive access to low-cost training and technical assistance from a Quality Coach and a Professional Development Advisor but for fewer hours than Building Quality programs. After receiving a full-rating, programs that are awarded a One-, Two-, or Three-Star rating receive up to $1,000 post-rating quality improvement supports. Improvement supports are available to programs regardless of whether they participated in Building Quality.

Programs pursuing a full-rating enter Parent Aware at two time-points each year in groupings called "cohorts." One cohort begins in January, and one cohort begins in July. The process from the time the cohort begins to the time of a rating designation takes approximately six months, with ratings issued June 30th and December 31st of each year.

Nationally accredited child care centers and family child care programs as well as Head Start, school-based pre-kindergarten programs, and Early Childhood Special Education programs enter Parent Aware via the Accelerated Pathway to Rating (APR) on a rolling basis (not in cohorts). The APR process was developed to recognize programs that meet quality standards set by external agencies (such as national accreditation bodies or Head Start Performance Standards) or laws (such as Minnesota Statutes 124D.15 for school-based pre-kindergarten programs). These programs have a streamlined process to achieve a Four-Star rating once they submit evidence that their curriculum and assessments tools align with the Minnesota Early Childhood Indicators of Progress. All lead teachers in APR programs must document that they have achieved 8 hours of training, coaching,

consultation, or mentoring on implementing curriculum as well as 8 hours of training, coaching, consultation, or mentoring on authentic child assessment. APR programs do not have access to the quality improvement supports available to programs that receive a full-rating. However, APR programs do have access to low-cost trainings, and they do have access to technical assistance from MDE (for school-based pre-kindergarten programs, Head Start, and Early Childhood Special Education programs) or from Child Care Aware (for accredited child care centers and accredited family child care programs) to help them determine which professional development events meet the curriculum and authentic assessment requirements for APR programs.

The Parent Aware Rating Tool

Parent Aware is a hybrid rating system. It includes "blocks" of indicators at a One- and Two-Star rating (in which all criteria must be met at each level to achieve the rating). Programs seeking a Three- or Four-Star rating must meet all the criteria at the first two levels and earn points to determine which of the higher levels they will be awarded.[20] Programs identify a "goal" rating and work with their Quality Coach to achieve the requirements for that rating. Nationally, nearly 40% of QRIS (15 of 40) use a hybrid rating structure (QRIS Compendium, 2015).

Parent Aware indicators are grouped into four categories:

1. Physical Health and Well-Being
2. Teaching and Relationships
3. Assessment of Child Progress
4. Teacher Training and Education

The quality indicators in these categories are nearly identical for family child care programs and child care centers. Major differences in indicators across the two program types are noted below in the Teaching and Relationships category and the Teacher Training and Education category. Appendix A: Parent Aware Indicators and Scoring Criteria for Child Care Centers and Family Child Care contains full details about the Parent Aware indicators and scoring criteria.

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[20] To earn a Three- or Four-Star rating, child care centers must score 2.5 on the Instructional Support sub-scale of the CLASS, use a curriculum aligned with the Minnesota Early Childhood Indicators of Progress in all classrooms, have all lead teachers trained on curriculum implementation and score at least one point in each quality category. Requirements are similar for family child care providers except that they are not assessed on the CLASS.

Physical Health and Well-Being

The Physical Health and Well-Being category includes indicators for providing families with contact information for services such as: health and screening (dental, mental health, special education, and early childhood screening) (One-Star); information about family support services such as the Child Care Assistance Program, Early Learning Scholarships, and public health services (Two-Star). A Two-Star rating also requires a self-assessment of the environment and goal setting for the program. To earn a Three- or Four-Star rating, programs must meet at least one additional Physical Health and Well-Being indicator, such as providing additional assistance to help families get the supports they need, participating in the Child and Adult Care Food Program, or teacher training on child nutrition and obesity prevention along with providing samples of menus used in the program.

Teaching and Relationships

To earn a One-Star rating, programs must provide families with contact information for local family education options, such as Early Childhood Family Education (ECFE), and lead teachers and family child care providers must complete 8 hours of training in child development. For a Two-Star rating, programs must hold an orientation for new families and discuss preferences including family traditions. Programs must also use lesson plans and a daily schedule. Lead teachers and family child care providers must have 8 hours of training on the Minnesota Early Childhood Indicators of Progress (ECIPs). To earn a Three- or Four-Star rating, programs must use a curriculum aligned with the ECIPs and all lead teachers/family child care providers must have training on implementing curriculum. Classroom Assessment Scoring System (CLASS) observations are required for center-based programs with preschool classrooms to earn a Three- or Four-Star rating.

Assessment of Child Progress

To earn a One-Star rating, lead teachers/family child care providers must complete two hours of training on authentic observation practices and must observe children regularly and record information monthly. For a Two-Star rating, programs must share the authentic observation summaries with families. To earn a Three- or Four-Star rating, programs must conduct child assessments with an approved tool, lead teachers/family child care providers must be trained on authentic child assessment, and the program must earn at least one additional point. Points can be earned for assessing children in all domains of child development, conducting assessments at least twice per year, and for providing families

with assessment results and using child assessment information to design goals and guide instruction for individual children. The indicators were revised in July 2014.[21]

Teacher Training and Education

To earn a One-Star rating, lead teachers/family child care providers must have an individual membership in Develop which requires them to submit their training and professional development credentials. For a Two-Star rating, lead teachers/family child care providers must have professional development plans. Points to reach a Three- or Four-Star rating are earned based on the education level of the director (for child care centers) and by teachers'/family child care provider's level on the Career Lattice (the average level is used for child care centers).

ParentAware.org

Parents and other consumers can access Parent Aware ratings on parentaware.org, a web-based search tool that contains entries for all early care and education programs, regardless of whether they have a Parent Aware rating. To facilitate the selection of Parent Aware-rated programs, Parent Aware programs are listed first in search results. In addition, parents and consumers can filter their searches by program rating, program type, and a variety of other search criteria. The Year 3 Evaluation Report included an analysis of initial website activity on parentaware.org (Cleveland et al., 2015).

Participation and Ratings in Parent Aware

As of October 15, 2015, 2,247 programs were rated in Parent Aware (see Table 1). Statewide, across all program types eligible for participation, approximately 18% are enrolled in Parent Aware. The majority of programs have a Four-Star rating (see Figure 1). Just under 60% of programs have a Four-Star rating achieved through the APR process and 8% have a Four-Star rating achieved through the full-rating process.

The number of programs in Parent Aware has increased steadily since 2012 (see Figure 2). The steepest growth over time occurred among non-accredited family child care programs which increased from 56 programs in 2012 to 760 programs in 2015.

Compared to other RTT-ELC state grantees funded in the first round, Minnesota's progress on Parent Aware is noteworthy.[22] In 2014, of the nine grantees, only North Carolina

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[21] The first set of statewide indicators applied to programs that joined Parent Aware and received ratings between June 2012 and June 2014. The revised set of indicators applies to programs that began in July 2014 and were rated in December 2014 or later.

reported having a larger total number of programs in the top tiers of its QRIS (4,105 in North Carolina compared to 1,397 in Minnesota; note that the QRIS in North Carolina is integrated into licensing so participation is higher than other states). The next highest states for participation in the top tiers of the QRIS are: California, 662; Ohio, 481; Delaware, 218; Maryland, 166; Massachusetts, 96; Washington, 93; and, Rhode Island, 66. Thus, Minnesota stands out as a state with a high number of programs in the top tiers (the third and fourth levels of Parent Aware). The Accelerated Pathway to Rating process has played a clear role in Minnesota's success on this indicator documented in the RTT-ELC Annual Performance Report.

Table 1. Number of rated programs and percent of programs eligible statewide for Parent Aware that were rated as of October 2015, by program type and rating pathway

Pathway	Program Type	Programs rated in Parent Aware	Eligible Programs in 2015	Percent rated
APR	School-based pre-kindergarten program	673	700	96%
	Head Start & Early Head Start	255	286	89%
	Individuals with Disabilities Education Act – Part B Programs	46	424	11%
	Accredited Child Care Centers	325	417	78%
	Accredited Family Child Care	18	27	67%
	APR Overall	**1317**	**1854**	**71%**
Fully-rated	Non-accredited Child Care Centers	170	1216	14%
	Non-accredited Family Child Care	760	9637	8%
	Fully-rated Overall	**930**	**10853**	**9%**
	Total	**2247**	**12707**	**18%**

Source Develop, Minnesota's Quality Improvement and Registry Tool (October, 2015).
Notes: IDEA Programs (also referred to as Early Childhood Special Education) became eligible to be rated on 10/1/2013. The number of eligible accredited child care programs comes from Minnesota's NACCRRAware data system as of March 3, 2015. The number of eligible non-accredited licensed child care programs comes from DHS Licensing Lookup as of April 8, 2015, minus the number of accredited programs. The number of eligible Head Start sites and IDEA/Early Childhood Special Education sites comes from the Minnesota Department of Education as found in Minnesota 2014 RTT-ELC Annual Performance Report. The number of eligible school-based sites is not known, but is estimated to be about 700.

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[22] See a summary of state RTT-ELC Annual Performance Reports for 2014: http://www2.ed.gov/programs/racetothetop-earlylearningchallenge/2014apr/rtt-elc-2014-apr-progress.pdf

Figure 1. Star-rating of Parent Aware-rated programs as of November 2015 (n = 2247)

One-Star
14%

Two-Star
14%

Three-Star
5%

Four-Star
8%

APR Four-Star
59%
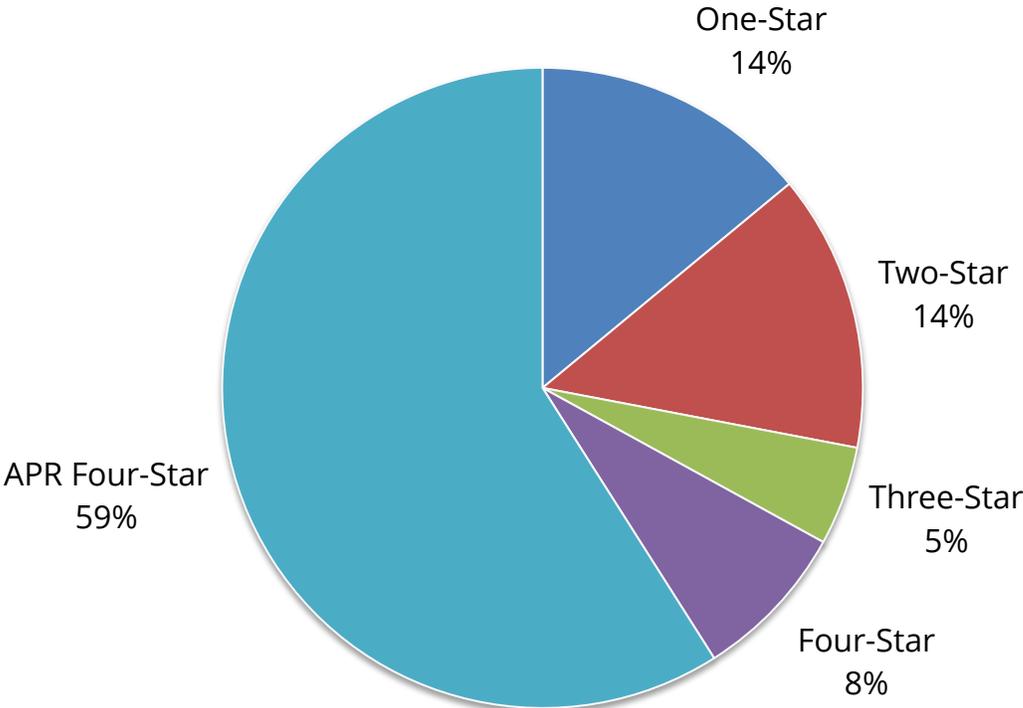
Source: Develop, Minnesota's Quality Improvement and Registry Tool (October, 2015).

Figure 2. Growth in Parent Aware ratings from 2012 through 2015, by program type
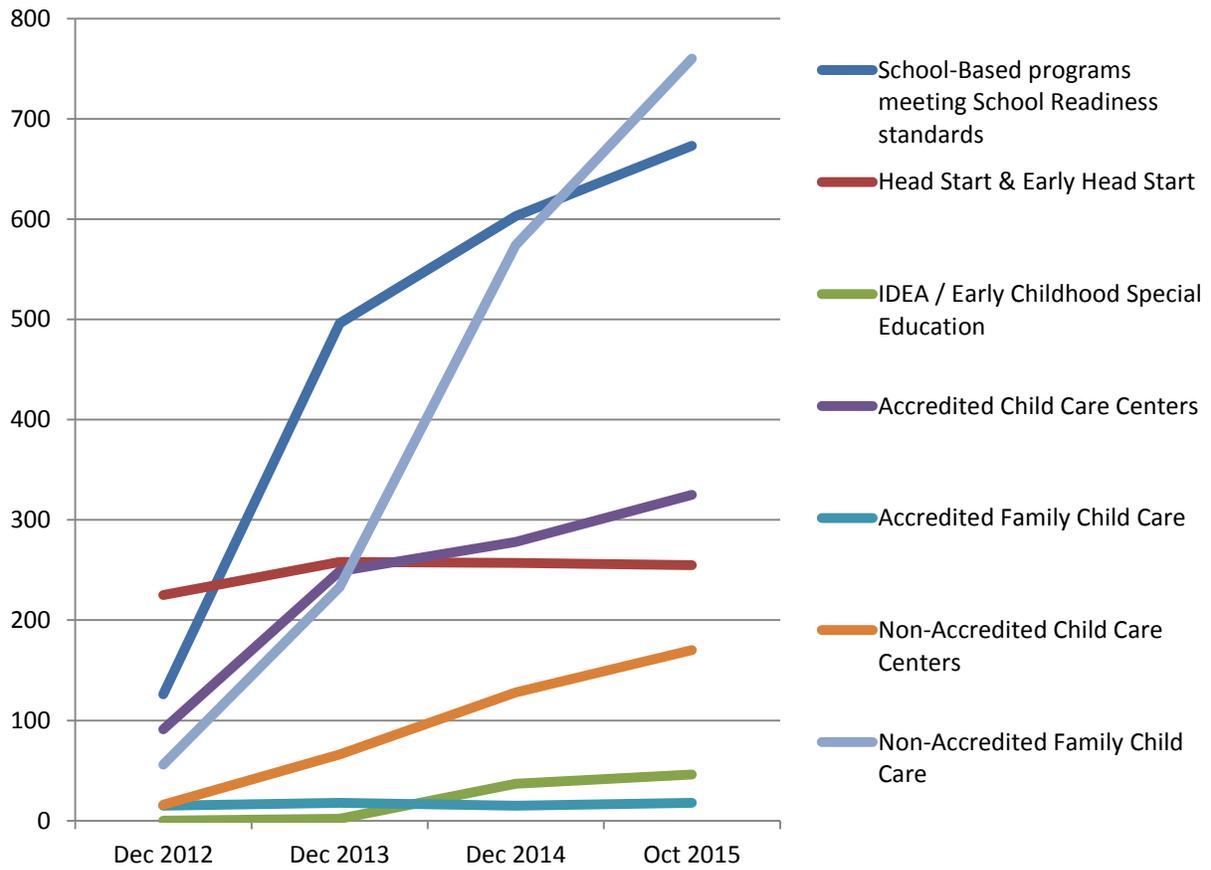
Source: Develop, Minnesota's Quality Improvement and Registry Tool (October, 2015).

Section 2. Parent Aware Validation

Quality Rating and Improvement Systems (QRIS) are policy initiatives designed to improve the quality of early care and education (ECE) programs. Though the specific details vary across states and local areas, a QRIS typically includes a process to measure and rate the quality of ECE programs, to disseminate ratings to parents and the public, and to support ECE programs in quality improvement. Increasingly, QRIS ratings are used to identify ECE programs that are eligible to participate in other early childhood initiatives. In Minnesota, for example, one purpose of Parent Aware is to identify high quality programs that can serve children receiving Early Learning Scholarships. Programs with Parent Aware ratings are also eligible to receive higher rates for quality through Minnesota's Child Care Assistance Program.[23]

When QRIS ratings are used as a centerpiece of an ECE system, it is important to determine that ratings are working as intended through the process of QRIS validation. The essence of a validation process is to assess the extent to which QRIS ratings meet interrelated criteria for being fair, accurate, and meaningful.

- Ratings that are *fair* are produced from a reliable, equitable process. Reliability in a QRIS can be ensured by putting in place strong training of those involved in the rating process and frequent monitoring of the rating decisions that are made. A reliable rating is one that is stable regardless of the specific people involved in determining the rating (for example, those reviewing program documentation or conducting classroom observations) or the time of year the rating process is happening. An equitable process is one that doesn't vary by the location of early care and education programs, the type of program, or the population of children and families served by the program. An equitable process is also one that doesn't overburden ECE program participants by assessing indicators of quality that are superfluous, redundant, or that don't contribute to the overall rating.
- Ratings that are *accurate* reflect and distinguish the true quality of services available to children and families in the program. For example, the environment, interactions and experiences of children and parents in programs with a high rating (at the top level of the QRIS) should be of higher quality – and visibly different – than those in

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[23] Three-Star rated programs receive a 15% quality differential and Four-Star rated programs receive a 20% quality differential. As of December 2015, Parent Aware rated programs at any Star level can serve children receiving scholarships. Beginning in July 2016, only programs with a Three- or Four-Star rating can serve children receiving scholarships.

programs with a low rating (at the lowest level of the QRIS). An accurate rating is also one that changes when quality changes.

- Ratings that are *meaningful* measure and promote the elements of quality that link to the outcomes targeted by the QRIS. Because QRIS aim ultimately to support the positive development of young children, meaningful ratings should be comprised of quality indicators that have been shown through research to support children's language and literacy, early math skills and social-emotional development.

Addressing the question of QRIS validity is a critical step when using ratings for accountability and improvement initiatives. Indeed, the Race to the Top - Early Learning Challenge (RTT-ELC) Grant required that state grant recipients invest in validation of the QRIS. As a result, multiple QRIS validation studies are in process nationally and will publish results beginning in 2016.

Though state QRIS were first developed in the late 1990's, the growth in new systems was greatest in the last five years (from 22 to 40; QRIS Compendium, 2015). Since 2011, many existing QRIS underwent redesign or revisions in response to new requirements from RTT-ELC (for example, to incorporate quality indicators related to health and to include more early care and education program types such as Head Start and state pre-kindergarten programs). Thus, QRIS are still relatively new as a policy framework for supporting quality improvement. Research can play an important role in supporting design and revision of QRIS (Tout, 2013).

To date, the limited research on QRIS validation nationally has produced mixed results. A recent literature review that includes findings from the pilot of Parent Aware and 11 other QRIS evaluations indicates that higher scores on the Environment Rating Scales (which measure global quality) are found in programs with higher ratings; however, most of the QRIS include scores from the Environment Rating Scales in the rating which may inflate the results (Karoly, 2014). Among four studies with strong research designs, two documented linkages between children's development and QRIS ratings. Thus, there is a pressing need to build the literature with information about how QRIS ratings are functioning in practice and how ratings are associated with children's development. The current study was conducted in part to fill this gap.

Early care and education researchers have defined QRIS validation as a multi-step process, not a construct that can be addressed fully with only one study or one analysis (Zellman & Fiene, 2012). In Minnesota, we have addressed the question of validation through a series of activities launched in parallel with implementation of statewide Parent Aware

expansion.[24] Some of the activities are research activities conducted by Child Trends and other activities are conducted by the Statewide Parent Aware Coordination Framework as part of their management of Parent Aware.

- To address whether Parent Aware ratings are fair, Child Trends has analyzed the quality indicators in the rating scale to understand scoring patterns and whether certain indicators are more or less likely to be met by programs.[25] Child Trends has also tracked provider perceptions of Parent Aware and the implications for improving access and enrollment in Parent Aware.[26] Through analysis of Develop (the data system that supports Parent Aware),[27] DHS tracks participation in Parent Aware on a quarterly basis (looking across program type and state geography) and analyzes the extent to which children with high-needs are being served in rated programs. In addition, DHS has developed protocols to assess whether reliability of the rating process is established and maintained over time.[28]
- To address whether Parent Aware ratings are accurate, Child Trends analyzed whether scores on measures of observed quality differ by program ratings. We also analyzed whether accuracy of the ratings differs by the rating pathway programs use to enter Parent Aware (the full-rating or the Accelerated Pathway to Rating). The results of these analyses are presented in Section 4. Observed Quality and Parent Aware Ratings and Section 6. Parent Aware Rating Pathways.

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[24] In addition to the validation analyses on the current version of Parent Aware, the Minnesota Early Learning Foundation supported a validation study of the Parent Aware pilot in place from 2007 through 2011 (see Tout et al., 2011 for the final report).

[25] For more information, see the Year 2 and Year 3 reports conducted by the Parent Aware Evaluation team (available at http://www.pasrmn.org/work/research). Findings were also shared in an internal memo submitted to the Department of Human Services.

[26] For more information, see the provider perception reports (available at http://www.pasrmn.org/work/research).

[27] Information about Develop is available at: http://www.developtoolmn.org/. In addition, see the Year 3 Parent Aware Evaluation Report for details: http://tinyurl.com/nw2qc8z.

[28] According to DHS, raters go through a reliability process in which a rater identified as the "anchor" double-codes a minimum of 10% of each rater's assigned cases. This happens for both full-ratings and APR ratings. The interrater reliability process was built into Develop in 2015 to ensure the process can be blind. The anchor views the same uploaded evidence the rater used, but the rater's judgments are hidden from the anchor's view. Raters must agree with the anchor about the indicator-level score at least 85% of the time. This benchmark has been exceeded in each cohort. When discrepancies between raters and the anchor occur, the team uses those discrepancies as an opportunity to clarify or refine the rating rules to prevent further discrepancies.

- To address whether Parent Aware ratings are meaningful, Child Trends and DHS conducted an evidence review to document the research base supporting each quality indicator.[29] In addition, Child Trends conducted extensive data collection and analysis to examine how Parent Aware ratings are related to measures of children's development, including their language and literacy skills, math skills, and socio-emotional development. Because a Parent Aware rating is intended to identify early care and education programs that are effectively supporting children's development, especially those children with risk factors that make them vulnerable to poor school outcomes, the analyses also consider the developmental progress of children with low family incomes. The results of these analyses are presented in Section 5. Children's Development and Parent Aware Ratings.

A QRIS validation process considers multiple sources of evidence and does not produce a yes/no designation of validity (Zellman & Fiene, 2012). In Minnesota, the Parent Aware validation process has been conducted with the input of Parent Aware stakeholders and a Technical Expert Panel to produce information that can contribute to continuous improvement of Parent Aware. Table 2 displays a summary of key validation questions, the sources of evidence used to answer the question and the hypothesis based on existing research and design rationale for Parent Aware. In Section 7. Putting the Findings in Context, we return to Table 2 and add findings from the validation activities as well as implications for Parent Aware design and implementation.

Table 2. Parent Aware validation questions, sources of evidence and hypotheses

Key Questions for Initial Validation of Parent Aware	Source of Evidence	Hypothesis
Are the Parent Aware quality indicators consistent with the evidence base on early care and education program quality?	Evidence review[30]	The Parent Aware quality indicators are based on research and best practice according to professional guidelines.
Do programs seeking full ratings gain points on Parent Aware indicators in expected ways (i.e., showing that they are working on quality indicators across different aspects of quality)?	Analysis of indicators[31] Provider reports of goal	Programs achieve points in each of the quality areas (Physical Health and Well-Being, Teaching and Relationships, Assessment of Child Progress, and Teacher Training

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[29] The evidence review is an unpublished document that was developed to provide support for internal discussions and decision-making.

[30] The evidence review was conducted collaboratively by Child Trends and the Minnesota Department of Human Services. It is an unpublished document (see note 16).

[31] The indicator analysis was conducted in a separate report and is not included in detail here. Further information is available upon request.

Key Questions for Initial Validation of Parent Aware	Source of Evidence	Hypothesis
	ratings[32]	and Education) to work toward a Four-Star rating.
Do aspects of observed quality differ in programs with higher ratings?	Observations of program quality	Scores on measures of global quality, teacher-child interactions and practices related to math, literacy, and individualized teaching will be higher in programs with higher ratings. Observed quality scores will also be associated positively with children's developmental growth.
Do measures of observed quality relate in predicted ways to patterns of children's development?	Assessments of children's development	
Do patterns of children's gains from fall to spring in the year before kindergarten align with Parent Aware ratings?	Assessments of children's development	Children in programs with higher ratings will show greater gains in developmental skills than children in programs with lower ratings.
Do patterns of findings with observed quality and children's development look similar for programs with a Three- or Four-Star full-rating and programs with an Accelerated Pathway to Rating?	Rating data, by pathway status	Associations with observed quality and children's development will look similar for Four-Star programs, regardless of rating pathway.

Limitations of the Initial Validation Study

In reviewing the validation results in this report, it is important to consider the context of Parent Aware implementation from the fall of 2013 through the summer of 2015 when the bulk of data collection occurred for the analyses presented. At that time, Parent Aware was in its second and third year of statewide expansion. Implementation research conducted for the Year 1 and Year 2 evaluation reports indicates that Parent Aware policies, procedures and rating processes were still being refined (Tout et al, 2013). Thus, minor inconsistencies in the rating process are likely and may indicate that ratings in the early years of Parent Aware are less reliable than those being issued later when policies and procedures became more standardized. These potential concerns should be factored in when interpreting the results.

In addition, the analyses in this report focus on the experiences of children in the year before they enter kindergarten. Though Parent Aware is open to programs serving children beginning at birth, resource limitations for the validation study did not permit inclusion of infants and toddlers. Future work should focus on addressing the extent to which the

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[32] See Year 2 Provider perception report available at: http://www.pasrmn.org/work/research.

Parent Aware ratings are capturing the features of quality that support the positive development of infants and toddlers. Similarly, children with special needs and children who could not be assessed using tools administered in English[33] are not included in the study. Efforts to understand the experience of these children in Parent Aware programs should be included in future research.

In addition, sample sizes were limited for certain types of programs. In particular, the sample size of fully-rated family child care programs is relatively small compared to the number of programs included in the APR sample. Though these numbers represented the distribution of programs in Parent Aware during the time of recruitment for the evaluation, family child programs in 2015 are the most rapidly growing program type in Parent Aware. If resources are available to support further evaluation, it will be important to conduct additional observations in family child care programs that represent the full range of programs rated in Parent Aware.

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[33] Fewer than 20 of the recruited children were not assessed in this study because of low English proficiency. However, we anticipate that greater numbers of children speaking languages other than English will participate in Parent Aware-rated programs over time and should be included in evaluation efforts.

Section 3. Programs and Children in the Parent Aware Evaluation

The core validation activities described in this report rely on data collected from Parent Aware programs and the children they serve. This section provides an overview of the sampling and recruitment strategies used in the evaluation. We also describe the tools used to assess children's development and report on how children are performing on the assessments in the year before they enter kindergarten. These descriptive data provide an important foundation for the analyses presented in Section 4. Observed Quality and Parent Aware Ratings and Section 5. Children's Development and Parent Aware Ratings.

Program Sampling and Recruitment for the Evaluation

The sampling plan for the Parent Aware Evaluation was designed to reflect Parent Aware enrollment but also to prioritize programs serving four-year old children with high-needs as defined by RTT-ELC. All fully-rated programs, all Head Start grantees, and all school districts were targeted for participation in the evaluation. Sampling of accredited child care centers was needed because of the large number of centers participating in Parent Aware. Only child care centers participating in the Child Care Accreditation Project (CAP) in the Twin Cities nine-county metro area were targeted for participation. In addition, accredited centers serving high proportions of low-income children were identified by working with administrators at two large child care chains in Minnesota.

Targets for enrollment by program type were determined by a power analysis prior to launching recruitment. The recruitment goals were referenced throughout the recruitment window and efforts were made to bolster recruitment when targets were not being met.

Programs were recruited into the Parent Aware Evaluation over a three year period. Recruitment into the first cohort began in the fall of 2012. Recruitment into the second cohort began in the summer of 2013 and continued through the fall of 2013. Recruitment into the third cohort began in the winter of 2014 and continued through the fall of 2014. A final recruitment effort to supplement the sample of programs with observation data occurred during the summer of 2015. Different recruitment methods were used for the various program and rating pathway types (see Appendix B: Sampling, Recruitment, and Data Collection Methods).

Table 3 and Table 4 display the number of programs in the Parent Aware Evaluation.[34] Appendix C: Data Sources contains a detailed description of program recruitment efforts by year.

Table 3. Description of ECE programs in the observation sample

	Licensed family child care program (fully-rated)	Accredited family child care program (APR)	Licensed child care center (fully-rated)	Accredited child care center (APR)	Head Start sites (APR)	School-based pre-kindergarten (APR)	Total / Average
Number participating in the evaluation	55*	2	135*	69	26	38	325
Mean total number of children enrolled in the program	8.60	9.00	61.23	82.59	55.67	13.27	53.66
Percentage of high-needs children served**	19%	11%	35%	36%	100%[1]	59%	32%
Average weekly hours of care children receive***	34		31		19	12	26

Source: Child Trends recruitment data 2012-2015 and Develop, Minnesota's Quality Improvement and Registry Tool (July, 2015).

* Includes family child care programs and child care centers in partnership with a Head Start grantee. More details are available upon request.
** The percentage of high-needs children served was self-reported by the program at the time of application for Parent Aware. "High-needs" were defined using the standards in the RTT-ELC grant

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[34] To reflect the general enrollment distribution, four outlier programs have been removed in "mean total number of children enrolled in the program" and "percentage of high-needs children served" in Table 3. The four outlier programs include a licensed family child care home that reported 42 children enrolled, a licensed child care center that reported 812 children enrolled, a Head Start site that reported 580 children enrolled, and a school-based pre-kindergarten program that reported 1080 children enrolled.
[1] This figure is assumed based on Head Start eligibility criteria.

and included the aggregate percentage of children from low-income families or children with disabilities or developmental delays, who are English learners, who reside on Indian lands, or who are migrant, homeless or in foster care.

*** Data source is the consent form parents complete for their child to participate in the Parent Aware Evaluation.

Table 4. Number of programs in the observation sample by pathway and Star rating

	One-Star	Two-Star	Three-Star	Four-Star	Total
Fully-Rated	30	64	35	61	190
APR	n/a	n/a	n/a	135	135
Total	30	64	35	196	325

Source: Child Trends recruitment data 2012-2015 and Develop, Minnesota's Quality Improvement and Registry Tool (July, 2015).

Parent Aware programs that enrolled in the evaluation were compared to Parent Aware programs that did not enroll in the evaluation using Parent Aware administrative data on three demographic variables: location, child enrollment, and program-reported percentage of children enrolled who were categorized as "high-needs". Location was defined by Child Care Aware District (Northeast, Northwest, Southern, West Central, West Metro, and East Metro). Child enrollment was total number of children enrolled in the program. The percentage of children with high-needs was self-reported by the program at the time of application for Parent Aware. It was defined using the standards in the RTT-ELC grant and included the aggregate percentage of children from low-income families or children with disabilities or developmental delays, who are English learners, who reside on Indian lands, or who are migrant, homeless, or in foster care.

There were no significant differences in location (district) between programs that enrolled in the evaluation and programs that did not enroll in the evaluation. Programs in the evaluation did have significantly higher child enrollment than programs not in the evaluation (averaging 89 children in evaluation programs compared to 31 children in non-evaluation programs, $p < .0001$), and reported serving a higher percentage of high-needs children (averaging 33% in evaluation programs compared to 28% in non-evaluation programs, $p < .02$) than programs not in the evaluation. It is important to keep these differences in program characteristics in mind when reviewing results.

It is important to note that at this early stage in Parent Aware implementation, we believe that programs that have volunteered to enroll in Parent Aware and are rated at different star levels offer the most appropriate point of comparison for each other. This comparison provides information that Parent Aware can use to improve implementation and the rating process. It is unclear what benefit the validation study would gain by inclusion of non-rated

programs in the analyses. For example, Parent Aware only recently became available statewide; thus, programs may be non-rated because they have never heard of Parent Aware or because they have actively avoided enrolling. Once Parent Aware enrollment has become more saturated in the state, a non-rated comparison group could be useful for understanding possible ways Parent Aware is supporting early care and education programs. Alternatively, if the volunteers for rating cohorts exceed the capacity for Parent Aware, a comparison group could be created from the waiting list. These strategies could be considered for future validation efforts.

Sampling and Recruitment of Children and Families

Children were recruited into the Parent Aware Evaluation in three waves: the first cohort was recruited in the fall of 2012, the second cohort in the summer/fall of 2013, and the third cohort in the summer/fall of 2014. An attempt was made to recruit children from all programs that agreed to participate in the evaluation. However, a number of programs do not have children represented in the sample. This may be due to having no eligible children in their care, not receiving consent forms from parents, or children not completing the assessment. In addition, data from children participating in the State of Minnesota Early Learning Scholarship evaluation and the Race-to-the-Top Early Learning Challenge Scholarship evaluation were included in the Parent Aware Evaluation data through a data sharing agreement with the Minnesota Department of Education. Children in all three evaluations were administered the same battery of assessments.

Recruitment of children for the Parent Aware, Early Learning Scholarship, and RTT-ELC evaluations was conducted using similar, yet uniquely tailored recruitment methods for each evaluation (see Appendix C: Data Sources). Children were eligible to participate in the evaluations if they attended a Parent Aware-rated program and would be entering kindergarten the following fall.

In child care centers, the classroom that served the most low-income four-year-olds was prioritized for recruitment. Center directors were asked to distribute consent forms to the parents of each four-year-old child in the selected classroom. Up to six children per classroom were eligible to participate. Up to two children per family child care home were eligible to participate. If more families returned consent forms, up to two additional children were enrolled to account for possible attrition in the sample from fall to spring. Researchers prioritized evaluation enrollment to families that received a child care subsidy to help pay for child care.

Researchers followed up with programs on a regular basis during the recruitment window to answer questions and to encourage them to return signed consent forms.

Child assessments were conducted at two time-points for each of the three cohorts: fall 2012 and spring 2013, fall 2013 and spring 2014, and fall 2014 and spring 2015.[35] Assessments were conducted by a trained Child Trends researcher at the child's program. The direct assessment lasted about 25-30 minutes in the fall and about 35-40 minutes in the spring (which accounted for the addition of a spring-only measure and the increased time children spent on each assessment as they answered more questions correctly). In addition to the direct assessments, the child's primary teacher/provider was asked to complete a series of questions about the children's social-emotional development. These checklists took about three to five minutes to complete for each child. Teachers and providers received a $5 gift card for each checklist they completed. Children received a book after each direct assessment in the fall and spring.

In total, 1181 children participated in the child assessment activities. Demographic information about the children in the sample is provided in Table 5. These data were obtained from the enrollment form completed by parents and scholarship application forms. In some cases, data were not complete, so the percentage of missing data is noted for each characteristic.

Table 5. Demographic information about children in the evaluation sample

Characteristic	n	Average or %
Child age		
Age at time of Fall assessment	1043	4.22
Age at time of Spring assessment	1032	4.65
Child gender		
Female	579	49%
Male	602	51%
Child race		
White/Caucasian	755	64%
African American or African Immigrant	178	15%
American Indian or Alaskan Native	17	1%
Asian American or Asian	53	4%
Hispanic/Latino	45	4%
Native Hawaiian or Other Pacific Islander	3	<1%
Other	69	6%
Missing	61	5%
Child's English skills *		
Excellent	552	47%

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[35] Children only participated in one cohort of data collection.

Characteristic	n	Average or %
Good	193	16%
Fair	45	4%
Poor	13	1%
Missing	378	32%
Dosage**		
Number of hours in care each week	776	26.42
Family income		
Low-income (below 185% of the federal poverty level)	730	62%
Higher-income (at or above 185% of the federal poverty level)	421	35%
Missing	30	3%
Use of financial assistance		
Child Care Assistance Program	150	13%
Early Learning or RTT-ELC Scholarship	418	35%
Missing	613	52%
Parent Education		
High School or less	241	20%
Some College	212	18%
College Degree	441	38%
Missing	287	24%
Geographic location		
Metro	526	44%
Non-Metro	600	51%
Missing	55	5%

Source: Child Trends recruitment data 2012-2014, Early Learning Scholarship data 2014, and RTT-ELC Scholarship recruitment data 2014.

*Parents rated their child's English speaking skill as either excellent, good, fair, or poor.

** Dosage refers to the number of hours a parent reports the child is in the early care setting each week. The mean is 26.42 hours, with a standard deviation of 14.61; the minimum is two hours and the maximum is 80 hours.

Two-thirds of the children in the sample were White, and about 15% were African-American or African immigrants. Smaller percentages of children were Asian American (4%), Hispanic (4%) or other race/ethnicities (6%). Data on English speaking skills were not available for nearly one-third of the sample; however, among those with a parent report of English speaking skills, 69% of children had excellent skills.[36] Two-thirds of the children were from

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[36] This percentage was calculated by dividing 552 by 803, the total number of children without missing data,

low-income families. These percentages reflect the priority to recruit low-income children for the evaluation.

Table 6, Figure 3, Figure 4, and Figure 5 display the number and percent of children participating in the assessments by program type, rating pathway and full-rating Star level. Most children in the evaluation attended a program that received its rating through the Accelerated Pathway to Rating (APR) process. Furthermore, the program type that enrolled the most number of children was accredited child care centers. The number and characteristics of children in the Parent Aware evaluation do not fully represent children statewide. Instead, the findings are generalizable to the population of children – particularly low-income children – participating in Parent Aware programs. Figure 6 displays the locations across Minnesota from which children participated in the evaluation.

Table 6. Number of children participating in the Parent Aware Evaluation by program type and rating pathway type

| Program Type	Number of Children Participating in Child Assessment Activities
One- and Two-Star rated Family Child Care Programs (n = 35)	69
One- and Two-Star rated Child Care Centers (n = 31)	108
(One- and Two-Star Subtotal)	*(177)*
Three- and Four-Star rated Family Child Care Programs (n = 29)	59
Three- and Four-Star rated Child Care Centers (n = 18)	72
(Three- and Four- Star Subtotal)	*(131)*
Accredited Family Child Care Programs (n = 2)	7
Accredited Child Care Centers (n = 104)	405
Head Start Programs (n = 43)	197
School-based pre-kindergarten programs (n = 82)	264
(APR Subtotal)	*(873)*
Total Children	**1181**
Total Programs	**344**

Source: Child Trends recruitment data and Develop, Minnesota's Quality Improvement and Registry Tool (July, 2015),

Figure 3. Percent of children participating in the Parent Aware Evaluation by rating pathway (N = 1181)
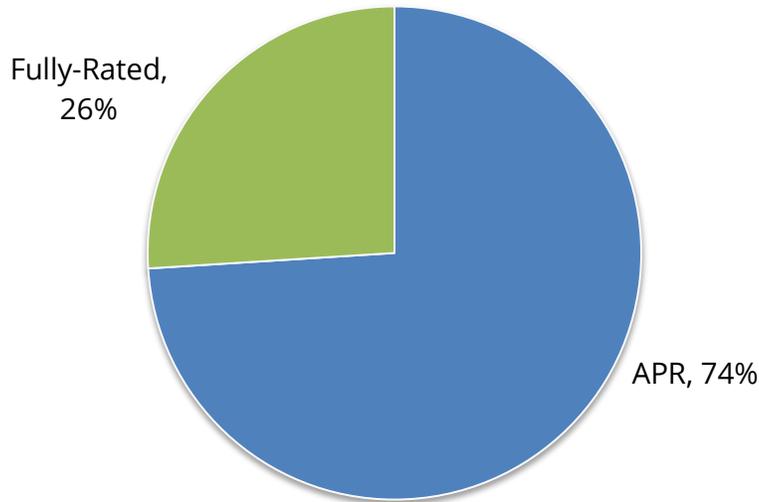
**Source:** Child Trends recruitment data and Develop, Minnesota's Quality Improvement and Registry Tool (July, 2015).

Figure 4. Percent of children participating in the evaluation by full-rating Star level (N = 1181)
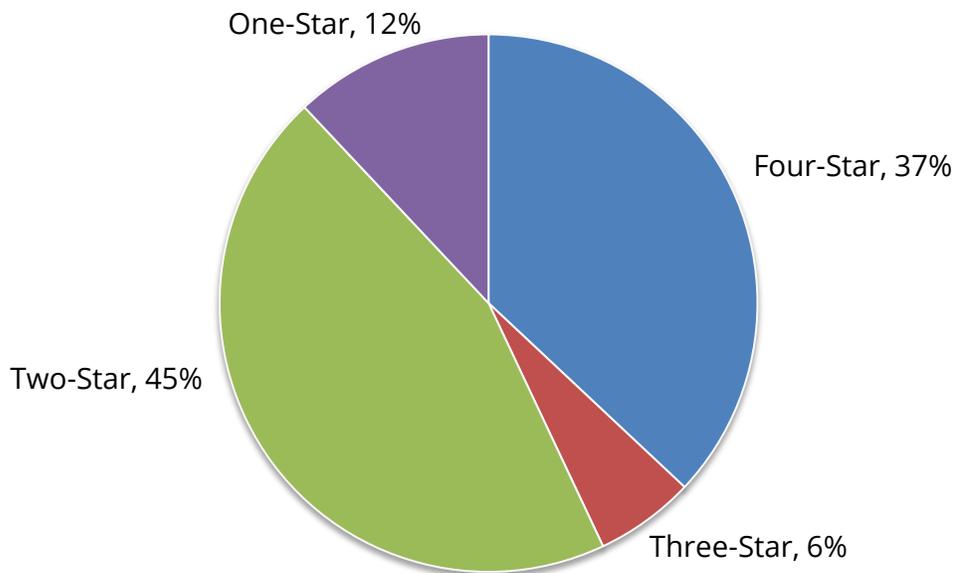
Figure 5. Percent of children in the Parent Aware Evaluation by program type (N = 1181)
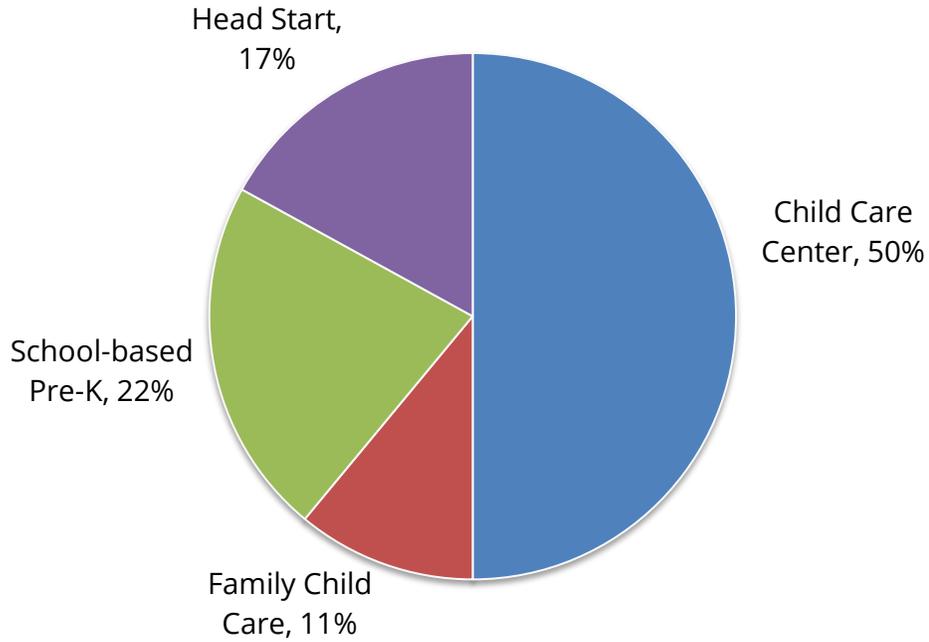
Head Start, 17%

Child Care Center, 50%

School-based Pre-K, 22%

Family Child Care, 11%

Source: Child Trends recruitment data and Develop, Minnesota's Quality Improvement and Registry Tool (July, 2015).

Figure 6. Locations in Minnesota from which children participated in the Parent Aware Evaluation
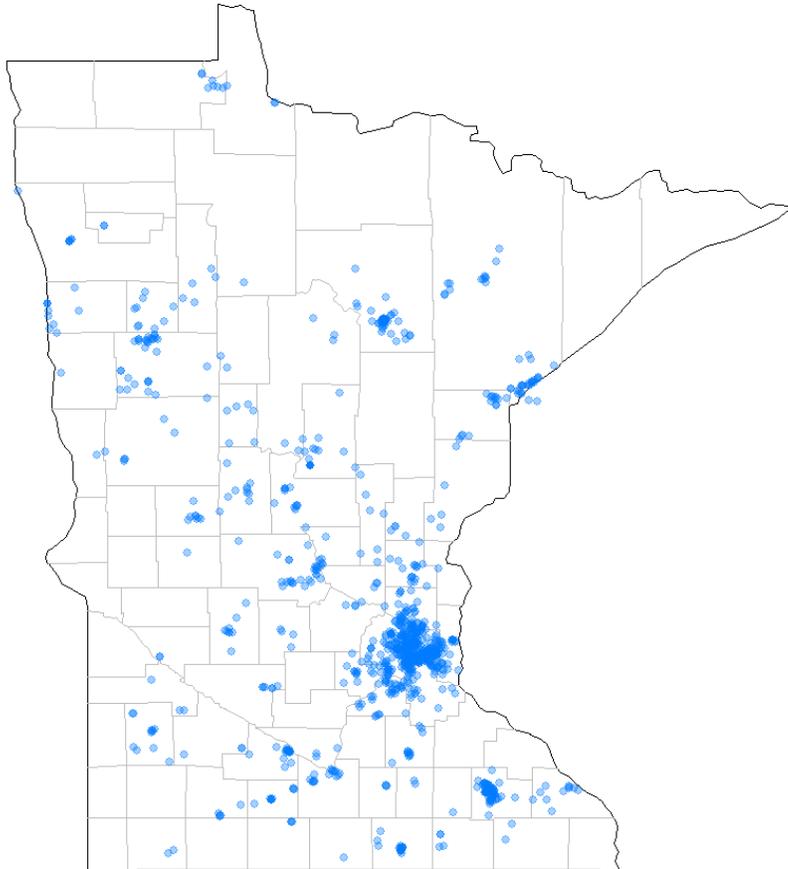
Source: Child Trends recruitment data

Child Assessment Tools

Children's development was assessed with a comprehensive battery of tools appropriate for 4-year olds. Across two teacher-reports and a set of direct assessments, the measures provide a comprehensive look at domains of school readiness including expressive language, early literacy skills, early math skills, social and emotional development, approaches to learning and health. A critical limitation of existing child assessment tools available to researchers and clinicians in early childhood development is that virtually no tools are available to administer in languages other than English. Therefore, the assessment battery was administered to children who were able to complete the

assessments in English. Further details about each tool are provided in Appendix C: Data Sources.

Before beginning the direct assessment battery, an English language screener (the *pre*LAS - Language Proficiency Assessment; Duncan & Avila, 1988) was used to determine if children could complete the assessments in English. This decision was made to ensure that children were not asked to participate in a process that was not developmentally appropriate given their skills and experiences. Children who did not complete both *pre*LAS sub-tests were administered an abbreviated assessment battery consisting of the Individual Growth and Development Indicators (IGDI; Early Childhood Research Institute on Measuring Growth and Development, 1998) and a Body Mass Index (BMI) measurement (height and weight). In total, 14 children in the fall assessment cohorts and 10 children in the spring assessment cohorts completed the abbreviated battery. Children who passed the *pre*LAS screener completed additional assessments measuring early literacy, executive function, early math skills, and cognitive skills. All assessments were administered in the fall and again in the spring, with the exception of the assessment measuring basic concepts, which was administered in the spring only.

Direct Assessments

Early Literacy. Children's early literacy skills were assessed using the Test of Preschool Early Literacy (TOPEL; Lonigan, Wagner, Torgeson & Rashotte, 2007). Two sub-tests were administered: Print Knowledge (naming letters, words and sounds) and Phonological Awareness (breaking up words by sounds). A standard score is produced (which has a mean of 100 and a standard deviation of 15).[37]Expressive language was assessed by the Picture Naming subtest of the IGDI. Children are asked to name as many pictures on individual cards as they can in one minute.

Executive Function. Executive function was assessed with Peg Tapping (Diamond & Taylor, 1996). The peg tapping test measures skills such as working memory and inhibitory control which are important for kindergarten readiness and relate to children's language and social competence (Bierman, 2008; Taylor, 1996). During the peg tapping test, the research assistant (assessor) explains two rules: when the assessor taps the peg one time, the child should tap the peg two times and when the assessor taps the peg two times, the child should tap the peg one time. This activity, while simple, requires children to inhibit their impulse to tap the peg many times or to copy what the assessor does. The activity also requires the child to remember "the rule" the examiner told the child at the beginning. The

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[37] Standardization of the TOPEL was based on a normative sample consisting of 842 preschool-aged children (3 to 5 years), residing in 12 states.

total possible number correct a child could score on peg tapping is 16. The peg tapping test has not been tested on a normed sample.

Early Math. Early math skills such as counting, addition, and subtraction are assessed with the Woodcock Johnson III (Woodcock, McGrew, & Mather, 2001) Applied Problems subtest. Children are shown pictures of various images and asked to identify the number of cows in a picture or which person is holding more balloons. The WJ-III has been tested for its validity, and standard scores are produced. WJ-III Applied Problems have been standardized to age-equivalent scores, which reflect children's performance in terms of the age level of an average performance on the assessment.

Basic concepts. In the spring, children were administered a screener that measures basic concepts, including colors, letters, numbers and counting, size and comparison, and shapes (the Bracken School Readiness Assessment, BSRA). The test is normed and standard scores are available. We refer to this assessment as the basic concepts screener.

Health. To assess health, children's height and weight were collected. Children's results were entered into the Centers for Disease Control and Prevention BMI calculator which produces a child's BMI for age percentile. BMI percentile serves as a screener for weight categories that may lead to health problems. Data are presented in the following categories: Overweight (≥ 95% percentile), Risk of Overweight (85th to 95th percentile), Normal Weight, and Underweight (< 5th percentile).

Teacher reported child assessments

In addition to the direct assessments, the child's primary teacher/provider was asked to complete a series of questions about the children's social-emotional development. Teacher reports are a standard way to capture information about children that researchers are not able to collect through direct assessment or observation. A limitation of teacher reports is that they may be biased by teacher characteristics. However, because of their wide use in early care and education evaluations, we feel confident that they are capturing important dimensions of children's development that would otherwise not be included in the evaluation.

Social-Emotional Development. The Social Competence and Behavior Evaluation short form (SCBE-30) is a teacher report consisting of 30 questions that provides an assessment of preschoolers' emotional adjustment and social competence. Three subscales are measured: Social Competence (emotionally mature, pro-social behaviors), Anger Aggression (oppositional behaviors, poor frustration tolerance), and Anxiety Withdrawal (anxious, depressed). Each subscale consists of 10 items rated on a 6 point scale indicating

the frequency a child engages in a behavior ranging from 1 = "Never" to 6 = "Always". Each subscale has a total of 60 possible points with higher scores indicating increased behaviors in Social Competence, Anger Aggression, or Anxiety Withdrawal (note that lower scores are more desirable in Anger Aggression and Anxiety Withdrawal).

Persistence. The Preschool Learning and Behavior Scale (PLBS) Attention/Persistence subscale is a teacher report checklist that assesses children's observable approaches to learning, specifically attention and persistence. The PLBS consists of 29 items concerning children's behavior (i.e. "pays attention to what you say") for which teachers mark 1 = "most often applies", 2 = "sometimes applies", or 3 = "doesn't apply". The persistence subscale uses 9 of these items, for a possible total of 27. The raw score was converted to a T-score (with a mean of 50 and a standard deviation of 10) per the developer's guidelines.

Children's Development in the Fall and Spring

Children's average scores and standard deviations on all child assessment measures for fall and spring are presented by family income in Table 7. Low-income was defined as a household income of less than 185% of the federal poverty level, and higher-income was defined as a household income above 185% of the federal poverty level.

Table 7. Descriptive statistics for fall and spring scores, by assessment and family income

Developmental Skill	Full Sample			Low-Income Children			Higher-Income Children		
	n	M	SD	n	M	SD	n	M	SD
Early Math Skills*									
Fall	1003	106.31	12.41	610	102.90	12.06	367	112.20	10.77
Spring	1017	106.90	12.28	609	103.50	12.10	386	112.40	10.58
Print Knowledge*									
Fall	1023	101.91	14.94	629	98.45	14.55	368	108.10	12.80
Spring	1012	104.36	13.41	604	101.40	14.21	386	109.00	10.56
Phonological Awareness*									
Fall	1007	96.24	16.84	615	92.42	16.66	366	102.90	15.04
Spring	988	102.02	16.27	585	99.10	16.78	381	106.70	14.15
Expressive Vocabulary									
Fall	1032	22.43	6.99	635	21.18	7.06	371	24.54	6.45
Spring	1027	25.82	7.18	619	24.28	7.38	386	28.28	6.00
Executive Function									
Fall	1019	11.10	4.69	626	10.30	4.93	367	12.50	3.85
Spring	1017	13.24	3.84	608	12.62	4.23	387	14.27	2.85
Basic Concepts Screener*									
Fall	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Spring	1010	102.60	16.16	604	98.15	16.51	384	109.75	12.90
Social Competence									
Fall	1013	41.23	10.23	617	39.89	10.37	373	43.41	9.48
Spring	1028	43.14	10.03	632	41.98	10.41	373	45.08	9.09
Anger Aggression[38]									
Fall	1018	18.48	9.35	620	18.85	9.82	375	17.91	8.46
Spring	1031	18.01	8.78	634	18.40	9.42	374	17.47	7.69
Anxiety Withdrawal[39]									
Fall	1019	17.34	6.73	620	17.54	6.90	375	16.88	6.17
Spring	1030	16.99	6.57	633	17.32	6.86	374	16.30	5.99
Persistence									
Fall	1006	50.16	10.91	610	49.03	11.17	372	51.99	10.07
Spring	1020	51.30	10.53	626	50.28	10.84	371	52.87	9.84

*Assessment with standard scores
Source: Child Trends child assessment data collection, 2012-2015

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[38] A decrease in Anger Aggression is a positive finding.
[39] A decrease in Anxiety Withdrawal is a positive finding.

The data in Table 7 reveal that the average scores of the full sample are close to the national averages on the child assessments with standard scores. When examining scores by income, however, it is clear that children with low incomes are starting and ending with lower scores than children with high incomes on every measure.

Next, a change score on each measure was calculated by subtracting the fall score from the spring score. Positive change scores represent gains from fall to spring, and negative scores indicate that children decreased their scores from fall to spring (note: negative change scores are desirable for anger aggression anxiety withdrawal and). Descriptive statistics for the full sample of children are presented in Table 8. Paired sample t-tests were conducted on all measures, and statistically significant fall to spring change scores are bolded in Table 8.

Table 8. Descriptive statistics for fall to spring change scores, full sample

Developmental Skill	n	Mean	SD	T	p	Cohen's d
Early Math Skills*	891	0.59	8.5	2.08	**< .05**	0.05
Phonological Awareness*	872	5.68	14.1	11.89	**< .0001**	0.35
Print Knowledge*	898	2.19	10.11	6.5	**< .0001**	0.17
Expressive Vocabulary	913	3.58	5.81	18.61	**< .0001**	0.48
Executive Function	899	2.16	3.82	16.98	**< .0001**	0.50
Social Competence	903	1.78	8.1	6.59	**< .0001**	0.19
Anger Aggression	908	-0.11	6.53	-0.5	n.s.	-0.05
Anxiety Withdrawal	907	0.18	5.87	0.91	n.s.	-0.05
Persistence	887	0.65	8.27	2.33	**< .05**	0.11

*Assessment with standard score
Source: Child Trends child assessment data collection, 2012-2015

Significant gains were made on most of the measures: early math skills, language and literacy (phonological awareness and print knowledge, expressive vocabulary, executive function, social competence, and persistence. There were no significant changes on anger aggression and anxiety withdrawal.

Supporting the development of vulnerable children is a priority for Parent Aware, and analysis in the evaluation is designed to examine how children with certain risk factors are developing. Change scores were examined for the subgroup of children from families with low incomes. Similar to the full sample, children from low-income families had statistically significant gains across the year before kindergarten on most measures. They did not show a desired decrease in anxiety withdrawal or anger aggression (see Table 9).

Table 9. Descriptive statistics for fall to spring change scores for children from families with low incomes

Developmental Skill	n	Mean	SD	t	p	Cohen's d
Early Math Skills*	526	0.98	8.58	2.63	**< .01**	0.11
Phonological Awareness*	512	6.69	14.61	10.37	**< .001**	0.46
Print Knowledge	533	2.86	9.95	6.64	**< .001**	0.29
Expressive Vocabulary	545	3.52	5.98	13.73	**< .001**	0.59
Executive Function	534	2.37	4.20	13.03	**< .001**	0.56
Social Competence	546	2.08	8.32	5.84	**<.001**	0.25
Anger/Aggression	549	0.28	6.99	0.93	n.s.	0.04
Anxiety/Withdrawal	548	0.13	6.29	0.47	n.s.	0.02
Persistence	534	0.63	8.46	1.72	n.s.	0.07

*Assessment with standard score
Source: Child Trends child assessment data collection, 2012-2015

Next, we tested whether the magnitude of developmental gains was different for children by household income. Low-income children made significantly greater gains than higher-income children on two language and literacy measures (phonological awareness and print knowledge) and executive function. They also showed a marginally significant increase in anxiety withdrawal.

Higher-income children scored significantly higher on the basic concepts screener (assessing concepts such as colors, counting, size and shape) than low-income children (109.75 and 98.15 respectively, $p < .0001$). Note that this measure was assessed only in the spring.

On BMI weight risk assessment, low-income children were more likely to be overweight and underweight than higher-income children (see Figure 7).

Figure 7. BMI weight risk categories by income group

Low-Income Children

13%*
12%
54%*
21%*

Higher-Income Children

7%*
15%*
66%*
12%*

- Overweight
- At Risk of Overweight
- Normal Weight
- Under Weight
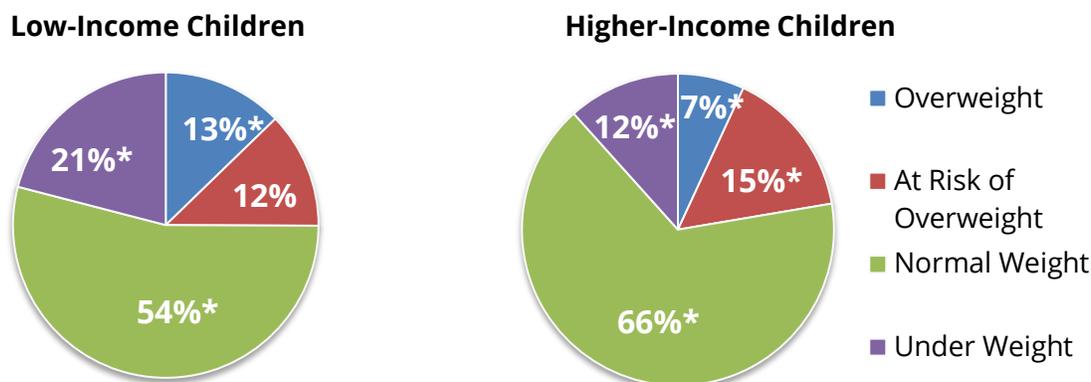
Source: Child Trends child assessment data collection, 2012-2015

Summary

Children in Parent Aware-rated programs made gains from fall to spring of their pre-kindergarten year on skills that are critical for their school readiness: math skills, language and literacy skills, executive function, social competence and persistence. Gains in language and literacy and executive function were greater for children from low-income families than for children from higher-income families, though spring scores for low-income children were still equal to or lower than fall scores for higher-income children.

Though low-income children made greater gains than higher-income children on some developmental measures, they scored significantly lower on a composite measure of basic concepts such as color, size, and counting. They also were more likely to be either over- or under-weight than the sample of children from higher-income families.

In Section 5. Children's Development and Parent Aware Ratings and Section 6. Parent Aware Rating Pathways, we look further at patterns of children's development by examining whether and how gains in their school readiness skills are linked to their participation in Parent Aware-rated programs of different rating levels, taking into account the multiple demographic characteristics that are also related to school readiness skills.

Section 4. Observed Quality and Parent Aware Ratings

As described in Section 2. Parent Aware Validation, one strategy used in QRIS validation activities is to examine whether and how the ratings produced are related in expected ways to other measures of quality (Zellman & Fiene, 2012). If Parent Aware is functioning as intended, it is expected that higher ratings will be associated with higher scores on measures of observed quality. To address this hypothesis, program quality data were collected using observational measures of global quality, teacher/child interactions, and curriculum practices in Parent Aware-rated programs. Associations between scores on quality measures and Parent Aware star ratings were examined.

In this section, we present the relationships between quality and rating level by comparing scores for One- and Two-Star rated programs compared to Three- and Four-Star rated programs by program type (child care centers and family child care programs). Four-Star rating includes Four-Star programs that earned their rating through the Accelerated Pathway to Rating (APR) process and Four-Star programs earning their rating through the full-rating process. Sample sizes did not permit separate comparisons across each Star rating level. Comparisons by rating pathway are presented in Section 6. Parent Aware Rating Pathways.

Measures of Observed Quality

Structured observations of classrooms and family child care programs can provide critical information about the quality of the teaching practices, care routines and experiences of the participating children. Observational measures used widely in the field of early care and education were conducted to capture and quantify these experiences so that programs at different rating levels could be compared.

Two tools were used in center-based programs participating in the evaluation (see Section 3. Programs and Children in the Parent Aware Evaluation for details about program sampling and recruitment).[40] The Early Childhood Environment Rating Scale – Revised (ECERS-R; Harms, Clifford and Cryer, 2005) was conducted to assess the quality of the environment, materials, activities, and health and safety provisions in classrooms serving children age 2.5- through 5-years old. An ECERS-R Total Score is produced and used in the

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[40] Center-based programs include Head Start sites, school-based pre-kindergarten sites, and child care centers.

analyses. Items on the Environment Rating Scales[41] (ERS) use a 7-point scale to assess multiple indicators. Scale developers describe the scoring as moving from inadequate quality (a score of 1) to minimal (a score of 3) to good (a score of 5) to excellent (a score of 7). ERS criteria are different from both licensing and accreditation standards. Some programs may be familiar with the ERS because it was used in the Parent Aware pilot. The average score on the ECERS-R documented across national evaluations and recent QRIS validation studies is approximately 4.0.

The Classroom Assessment Scoring System – Pre K (CLASS; Pianta, LaParo & Hamre, 2008) was conducted to assess the quality of teacher-child interactions. The CLASS produces three domain scores: Emotional Support, Instructional Support, and Classroom Organization. Because the CLASS is used in the Parent Aware rating process for child care centers seeking a Three- or Four-Star full-rating, CLASS scores were available for the evaluation through administrative data. The evaluation supplemented these data by collecting the CLASS in child care centers with a One- and Two-Star rating and in all APR programs participating in the evaluation. Score ranges according to the developers are low (scores of 1-2), mid (scores of 3-5), and high (scores of 6-7). It is important to note that scores on the CLASS Instructional Support domain have been documented nationally to be low (under 3).

The Family Child Care Environment Rating Scale – Revised (FCCERS-R; Harms, Cryer & Clifford) was conducted in family child care programs to assess the quality of the environment, materials, activities, and health and safety provisions. The FCCERS-R is appropriate for use in family child care programs serving children from infancy through school-age. The FCCERS-R is part of the ERS suite of tools and is scored like the ECERS-R on a 7 point scale. Averages on the FCCERS-R range from 3.0 – 4.0.

Select subscales from the Early Childhood Environment Rating Scale Extension (ECERS-E; Sylva, Siraj-Blatchford & Taggart, 2010) were conducted in classrooms and in family child care programs to assess the quality of specific practices to support children's development. The Literacy and Mathematics subscales were completed as well as one item on Planning for Children's Individualized Needs. The ECERS-E is scored like the ECERS-R on a 7-point scale. Most of the items scored for the ECERS-E are collected through observation; however, observers ask teachers to show examples of de-identified planning and record sheets for children.

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[41] The Environment Rating Scales (ERS) is the overall suite of tools measuring global quality in early care and educations settings.

The observations were conducted by trained and reliable research staff from the Center for Early Education and Development at the University of Minnesota.

Does observed quality vary in center-based classrooms by Parent Aware rating level?

The ECERS-R was conducted in 146 center-based programs. The mean ECERS-R total score was 3.95 (standard deviation = 0.59). This average score is 1-point below a 5.0 which is considered to be "good" quality by the authors of the ECERS-R. To examine the association between observed global quality and Parent Aware ratings, mean ECERS-R scores were calculated for One- and Two-Star rated programs and Three- and Four-Star rated programs. Results are presented in Figure 8.

Figure 8. Mean ECERS-R total scores by low and high Star rating (One- and Two- vs. Three- and Four-Star)
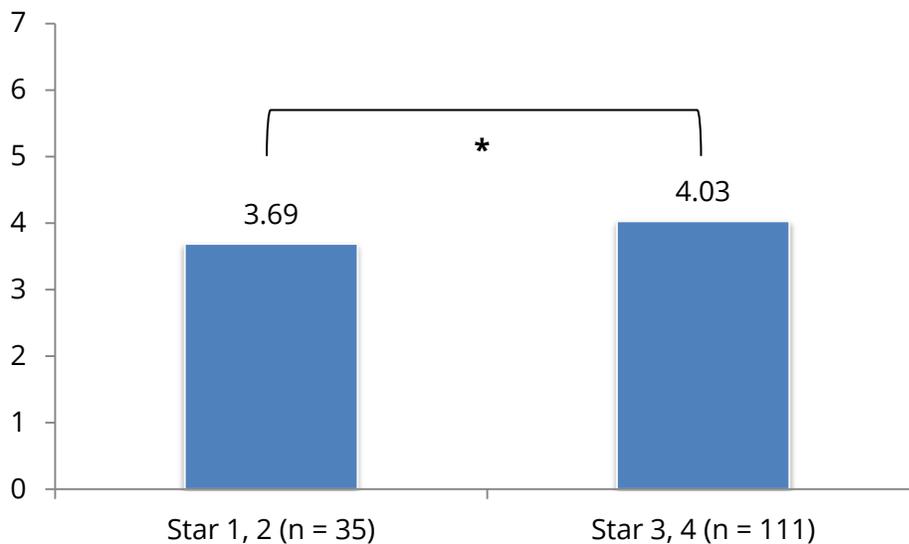
**Source:** Child Trends, Parent Aware Evaluation observation data collected 2012-2015

Three- and Four-Star programs, on average, scored 4.03 on the ECERS-R. One- and Two-Star programs, on average, scored 3.69 on the ECERS-R, which was significantly lower than Three- and Four-Star programs (p < .05).

Do teacher-child interactions vary in center-based classrooms by Parent Aware rating level?

The CLASS was conducted in 261 center-based programs. The means and standard deviations for CLASS domain scores across all programs are presented in Table 10. Consistent with national studies of the CLASS Pre-K, scores on Classroom Organization and Emotional Support are high, while average scores on Instructional Support are below a 3.0

Table 10. Mean CLASS domain scores for center-based programs

CLASS Domain	n	Mean	Standard Deviation
Classroom Organization	261	6.09	0.62
Emotional Support	261	6.26	0.58
Instructional Support	261	2.47	0.68

Source: Child Trends: Parent Aware Evaluation observation data and MN Department of Human Services: Parent Aware implementation observation data, 2012-2015.

To examine the association between CLASS scores and Parent Aware ratings, mean CLASS domain scores were calculated for One- and Two-Star rated programs and all Three- and Four-Star rated programs. Results are presented in Figure 9.

Figure 9. CLASS domain scores by low and high Star rating (One- and Two- vs. Three- and Four-Star)
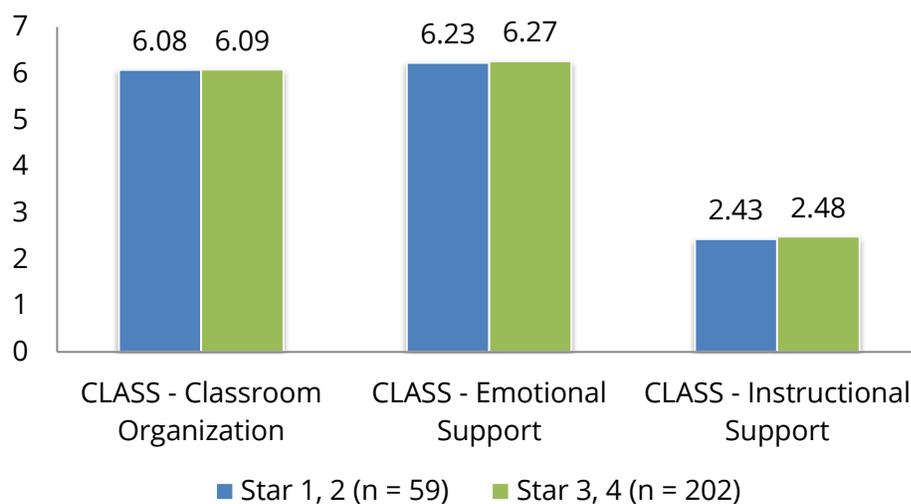
Star 1, 2 (n = 59)   Star 3, 4 (n = 202)

There were no significant differences between One- and Two-Star rated programs and Three- and Four-Star rated programs on any CLASS domain.

Do curriculum practices vary by Parent Aware rating level?

The ECERS-E subscales used in the evaluation capture specific teacher practices related to use of literacy, math practices, and planning for children's individualized needs. The average scores are presented in Table 11. Note that the average scores are low, as defined by the scale authors, particularly for the item Planning for Children's Individual Needs.[42] Mean ECERS-E subscale scores were calculated for One- and Two-Star rated programs and all Three- and Four-Star rated programs. The results are displayed in Figure 10.

Table 11. Mean curriculum practices in center-based programs

ECERS-E Subscale	n	Mean	Standard deviation
Literacy subscale	111	3.95	0.73
Mathematics subscale	113	2.94	0.84
Planning for Individualized Needs item	113	1.32	0.98

Source: Child Trends, Parent Aware Evaluation observation data collected 2012-2015

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[42] National data on the ECERS-E are not available for comparison.

Figure 10. ECERS-E curriculum practices in center-based programs by low and high Star rating (One- and Two- vs. Three- and Four-Star)
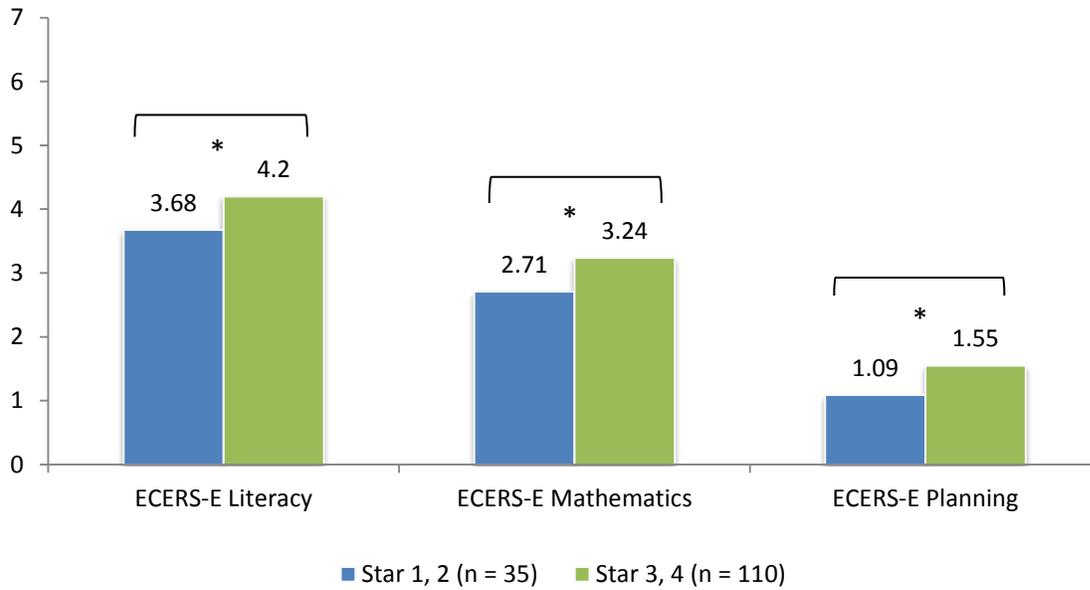
Source: Child Trends, Parent Aware Evaluation observation data collected 2012-2015

Three- and Four-Star rated center-based programs scored significantly higher than One- and Two-Star rated center-based programs on ECERS-E Literacy, Mathematics, and Individualized Planning scores (p < .05).

Does observed quality vary in family child care settings by Parent Aware rating level?

The FCCERS-R was conducted in 55 family child care programs. The mean total FCCERS-R score was 3.36 (standard deviation = 0.49). To examine the association between observed global quality and Parent Aware ratings, mean FCCERS-R total scores were calculated for One- and Two-Star rated programs and Three- and Four-Star rated programs. No significant difference was noted between higher and lower rated programs on the FCCERS-R total score. Results are presented in Figure 11.

Figure 11. FCCERS-R total scores by low and high Star rating (One- and Two- vs. Three- and Four-Star)
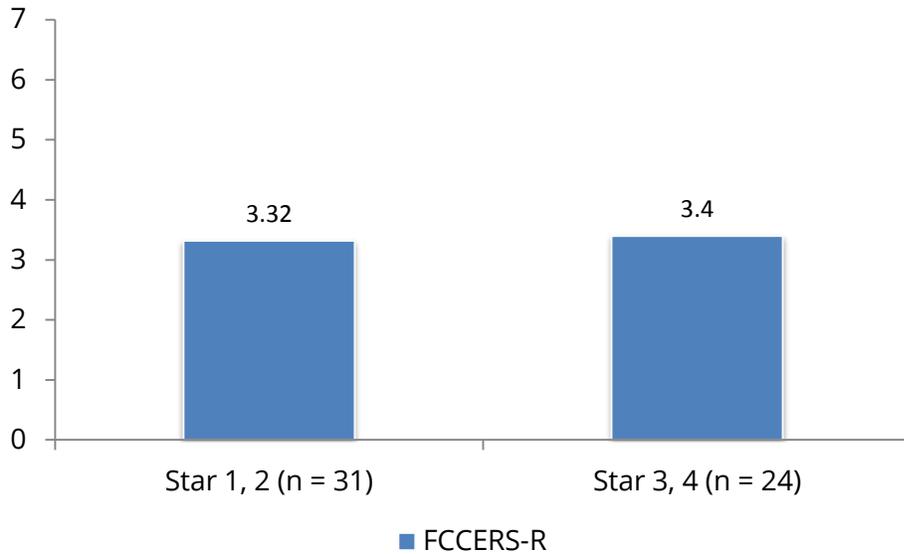
Source: Child Trends, Parent Aware Evaluation observation data collected 2012-2015

The ECERS-E was conducted in 55 family child care programs. Descriptive statistics for the Literacy and Mathematics subscales as well as the Planning for Individual Learning Needs item are presented in Table 12. Similar to the center-based programs, scores on the ECERS-E are low. Mean ECERS-E subscale scores were calculated for One- and Two-Star rated programs and all Three- and Four-Star rated programs. There were no significant differences between One- and Two-Star and Three- and Four-Star family child care programs on ECERS-E scores (see Figure 12).

Table 12. Mean curriculum practices in family child care programs

ECERS-E Subscale	n	Mean	Standard deviation
Literacy subscale	57	3.13	0.76
Mathematics subscale	57	2.59	0.91
Planning for Individualized Needs item	57	1.25	0.74

Source: Child Trends, Parent Aware Evaluation observation data collected 2012-2015

Figure 12. ECERS-E curriculum practices in family child care programs by low and high Star rating (One- and Two- vs. Three- and Four-Star)
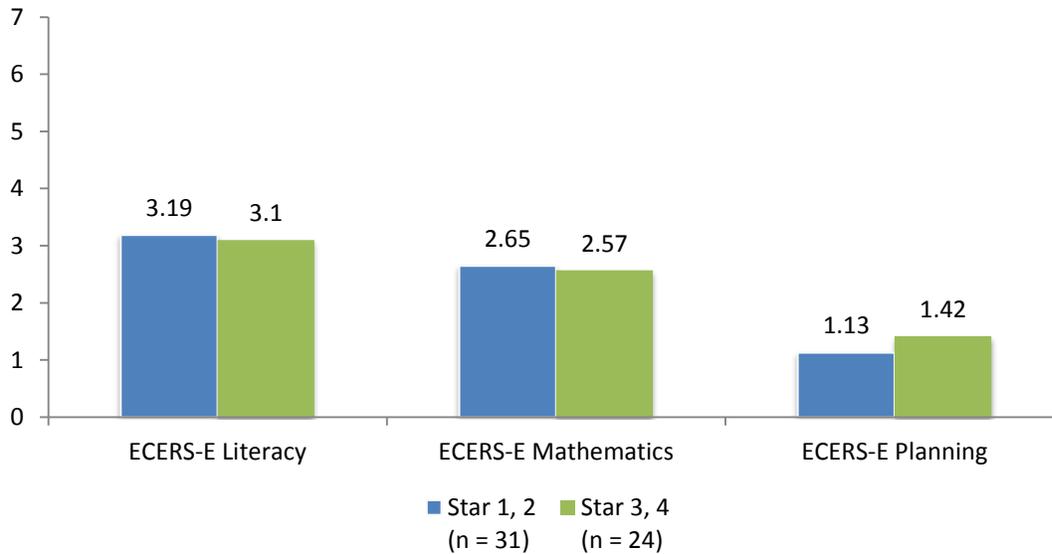
Source: Child Trends, Parent Aware Evaluation observation data collected 2012-2015

Summary

On four of the seven measures of observed quality examined, center-based programs with higher star ratings– those with Three- and Four-Star ratings – demonstrated higher scores than programs with lower ratings– those with One- and Two-Star ratings. As described in Section 2. Parent Aware Validation, we hypothesized that Parent Aware ratings would distinguish observed quality; in center-based programs, we find initial support for the validity of the ratings on this dimension.

No differences between programs by Star rating level were noted for family child care programs on the four measures we examined.

Section 5. Children's Development and Parent Aware Ratings

As described in Section 2. Parent Aware Validation, an examination of whether and how children's development is associated with the rating of the program they attend is a second approach to QRIS validation that supplements the examination of how observed quality differs by star rating (Zellman & Fiene, 2012). We hypothesized that the practices and interactions children experience in Parent Aware programs with higher ratings will be linked to gains on developmental skills that are larger than those for children in programs with lower ratings.

The Parent Aware Evaluation assessed children during the fall and spring of their pre-kindergarten year on a battery of school readiness assessments (see Section 3. Programs and Children in the Parent Aware Evaluation). The associations between children's developmental gains and Parent Aware star ratings were examined using rigorous analytic techniques that controlled for a number of demographic and experience factors that are also known to predict gains on children's skills. This strategy reflects the methods used in other evaluations of pre-kindergarten interventions and outcomes (for example, the study of state pre-kindergarten programs conducted by the National Center for Early Development and Learning, the study of teacher professional development conducted by the National Center for Research in Early Care and Education, and the study of curriculum approaches supported by the Preschool Curriculum Evaluation Research Consortium) in which children's development is assessed in the fall and spring of the year before kindergarten and associations are examined between children's growth and features of their educational experiences. While the approach is commonly used, it is important to note that it sets a high threshold for documenting effects because children's development is examined over a relatively short period of time (approximately six months).

Does children's development vary by Parent Aware rating?

Hierarchical linear models (HLM) were estimated to examine associations between Parent Aware ratings and children's developmental growth.[43] Similar to the analyses presented in Section 4. Observed Quality and Parent Aware Ratings on observed quality, programs were grouped into two categories: higher rated programs (Three- and Four-Star fully-rated programs and APR programs) and lower rated programs (One- and Two-Star fully-rated

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[43] HLM is important to use when individual children are "nested" within the same ECE programs.

programs). The analytic models included a full set of control variables including: child gender, age, race/ethnicity (white, other race/ethnic groups), English language skills (good, fair, poor, excellent), attendance in the fall (two weeks prior to the fall direct assessment test date, whether the child attended every day or nearly every day) and in the spring (six months prior to the fall direct assessment test date, whether the child was rarely or never absent), time between fall and spring assessments, parent education (high school or less, some college, college or higher), and income (low-income, higher-income).

In addition, the models included dosage of program experience, indicated by the weekly hours that children spent in programs. However, only 778 (about 66%) of 1,181 children in our sample had reported dosage information. A multiple imputation technique was used to address the missing data on dosage (see Appendix D: Details about Data and Analytic Methods for details).

Separate models were estimated for each of the developmental outcomes on which gain scores were calculated: early math skills, phonological awareness, print knowledge, expressive vocabulary, executive function, social competence, anger aggression, anxiety withdrawal, and persistence.

Table 13 presents a summary of results. Results indicate that children gained more on social competence (B = 2.65, SE = 1.01, p < .01) and persistence (B = 2.12, SE = 0.97, p < .05) when they attended higher-rated Parent Aware programs, compared to children who attended lower-rated Parent Aware programs. No other associations between Parent Aware ratings and children's developmental gains were statistically significant. Detailed results are available in Appendix E: Summary of HLM Analyses.

Table 13. Summary of Hierarchical Linear Modeling analyses testing whether children's development varies by Parent Aware rating (One- and Two-Star rating vs. Three- and Four-Star rating)

	Math Problem Solving	Phonological Awareness	Print Knowledge	Expressive Vocabulary	Executive Function	Social Competence	Anger Aggression	Anxiety Withdrawal	Persistence
Parent Aware rating	n.s.	n.s	n.s.	n.s.	n.s.	**Yes p<.01**	n.s.	n.s.	**Yes p<.05**

Note: n.s. = not significant
Source: Child Trends' analysis

Does the association between children's development and Parent Aware rating vary by children's income status?

A key question for the validation analyses based on the early care and education quality research literature is whether low-income children experience greater benefits of high quality programs than higher-income children. To address this question, HLM analyses were conducted to examine whether associations between Parent Aware ratings and children's development vary by income status. The models included an interaction term which examined whether gains differed for low-income children in higher rated programs.

A summary of results are presented in Figure 13 and 14. The horizontal axis marks two groups of children participating in either lower-rated or higher-rated Parent Aware programs. The vertical axis represents HLM-adjusted means of outcomes, that is, adjusted gain scores of each group of children after the full set of background variables were parsed out from the "raw" gain scores. The lines in each figure represent children in the sample based on family income level. One line represents children from low-income families and the other line represents children from higher-income families. Results indicated that, low-income children attending higher-rated Parent Aware programs gained significantly more than the higher-income children on print knowledge (B = 3.60, SE = 2.13, p < .10) and social competence (B = 3.05, SE = 1.72, p < .10). In sum, while all children benefited from higher quality programs on print knowledge and social competence, children from low-income families made greater gains in higher quality programs. No other associations between Parent Aware ratings and children's developmental gains were statistically significant by income status. Detailed results are available in Appendix E: Summary of HLM Analyses.

Figure 13. Summary of Hierarchical Linear Modeling analyses testing whether print knowledge varies by Parent Aware rating (One- and Two-Star rating vs. Three- and Four-Star rating) and low-income status
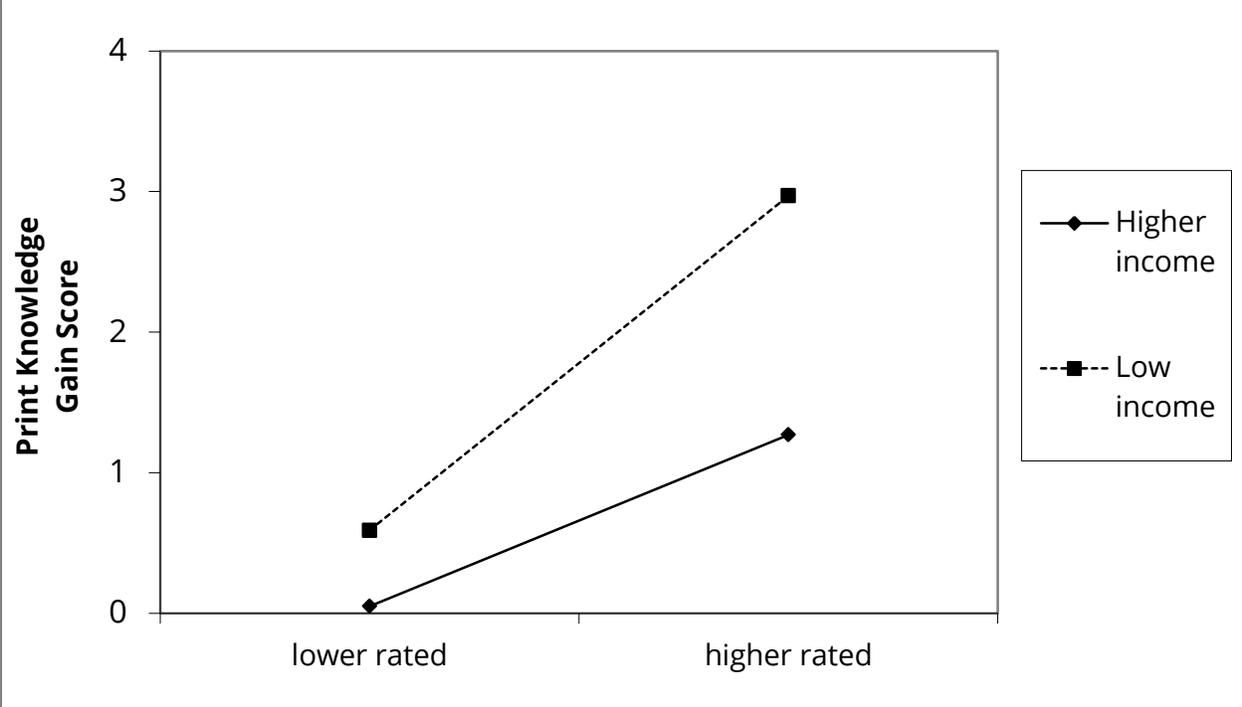
Source: Child Trends' analysis

Figure 14. Summary of Hierarchical Linear Modeling analyses testing whether social competence varies by Parent Aware rating (One- and Two-Star rating vs. Three- and Four-Star rating) and low-income status.
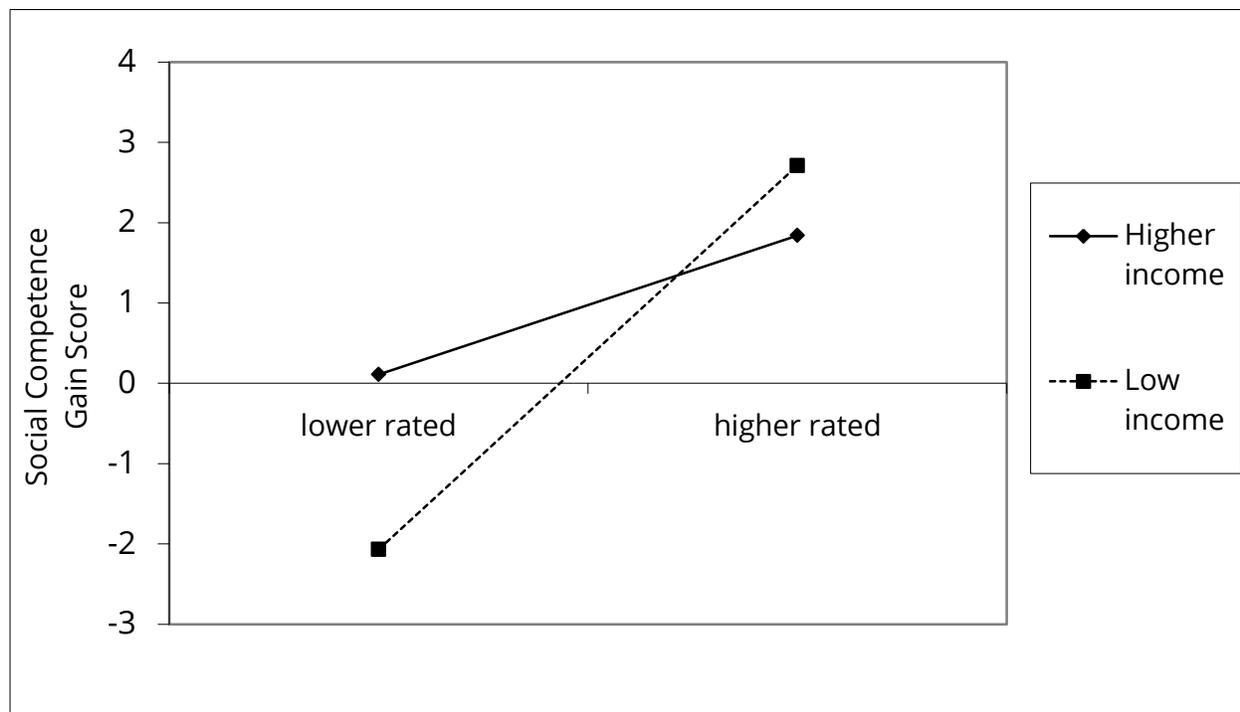
Source: Child Trends' analysis

Do aspects of observed quality relate in predicted ways to patterns of children's development?

In Section 4. Observed Quality and Parent Aware Ratings, an examination of observed quality revealed differences by rating level. While there is no perfect correspondence between rating and the observed quality measures examined in Section 4. Observed Quality and Parent Aware Ratings, it is a useful validation strategy to use observed quality as another source of evidence about program quality and to test relations with children's development.

HLM was used to test for the associations between observed measures of quality (ECERS-R, CLASS, FCCERS-R, and ECERS-E) and measures of child development using a full set of control variables including: child gender, age, race/ethnicity (white, other race/ethnic groups), English language skills (good, fair, poor, excellent), attendance in the fall (two weeks prior to the fall direct assessment test date, whether the child attended every day or nearly every day) and in the spring (six months prior to the fall direct assessment test date,

whether the child was rarely or never absent), time between fall and spring assessments, parent education (high school or less, some college, college or higher), and income (low-income, higher-income).[44] Two models were examined for each outcome: one for the full sample and one for low-income children to identify associations that may be working differently for at-risk children.

Results indicated that ECERS-R scores were linked to gains on print knowledge (B = 2.00, SE = 1.04, p < .10). For low-income children, ECERS-R scores were linked to gains on print knowledge (B = 3.17, SE = 1.76, p < .10) and phonological awareness (B = 6.80, SE = 2.36, p < .01).

In the full sample, CLASS Instructional Support predicted gain scores on executive function (B = 0.98, SE = 0.30, p < .01). This finding was marginally significant in the low-income sample (p = .054). CLASS Instructional Support also predicted lower anxiety withdrawal in the low-income sample (B = -2.06, SE = 1.05, p < .05).

In family child care programs, there were no significant associations between the FCCERS-R and any child development measures.

In centers and family child care programs, the ECERS-E Language scale was linked to gains on expressive vocabulary (IDGI; B = 0.96, SE = 0.46, p < .05) and social competence (B = 1.58, SE = .81, p < .10). No significant associations were found when the low-income sample was analyzed separately.

Summary

Children attending higher-rated programs made greater gains from fall to spring of their pre-kindergarten year on social competence and attention/persistence, a measure of children's approach to learning. In addition, low-income children attending higher-rated programs made greater gains on a measure of literacy (print knowledge) and social competence. Though findings linking children's development and Parent Aware ratings were not pervasive across every outcome examined, associations in the expected direction were noted on three of the five developmental domains examined in the analyses (language and literacy, social-emotional development and approaches to learning).

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[44] When categorical variables are included in an HLM analysis, one category is omitted from the model and serves as the reference category. The following categories served as the reference categories for the control variables included in the HLM analysis: white (race/ethnicity), poor skills (English language skills), college or higher (parent education), and higher income (income).

Further exploration of observed quality and children's development indicated positive associations though we note that there were relatively few significant findings given the number of models tested. The following associations were noted:

- Global quality scores in center-based programs (ECERS-R) were associated with gains on language skills for low-income children. And, higher rated programs scored higher on the ECERS-R than lower rated programs.
- ECERS-E Language practices were related to gains in expressive vocabulary. And higher rated programs had higher ECERS-E language scores than lower rated programs.

While the models examining ratings and child development showed only one linkage in the domain of language and literacy development (with low-income children gaining more on print knowledge in higher quality programs), the analysis of observed quality provides initial indications that practices engaged in by programs at higher rating levels were positively associated with all three measures of children's language development.

Taken together, the findings provide positive support for the validity of the Parent Aware ratings in supporting meaningful quality differences.

Section 6. Parent Aware Rating Pathways

Parent Aware enrollment occurs through two pathways as described in Section 1. Parent Aware Description. One pathway is a full-rating in which programs select a goal rating and provide documentation to show how the required quality indicators are met (for a One- and Two-Star rating) and to receive points for quality indicators at a Three- and Four-Star rating. Child care centers seeking a Three- or Four-Star rating also receive a CLASS observation to complete one of the required quality indicators. The full-rating pathway is open to licensed, non-accredited child care centers and family child care programs. The second pathway is the Accelerated Pathway to Rating (APR) which is open to accredited programs (child care centers and family child care programs), Head Start programs, and school-based pre-kindergarten programs meeting School Readiness standards. Programs entering Parent Aware through the APR process are eligible for a Four-Star rating after meeting indicators related to curriculum and assessment. The rationale for the APR process is that these programs are subject to quality standards and requirements outside Parent Aware and that a cost savings is created for the entire system by leveraging existing systems of monitoring and quality standards and creating a more streamlined process for rating. A central question for Parent Aware validation is the extent to which this important design decision to create multiple rating pathways results in star ratings that are functionally equivalent. In this section, we examine how observed quality and children's development vary by rating pathway. In addition, we compare observed quality and children's development across the different program types with an APR rating.

Observed Quality by Rating Pathway

In Section 4. Observed Quality and Parent Aware Ratings, center-based programs with higher ratings (Three- and Four-Star) had higher ECERS-R scores than programs with lower ratings (One- and Two-Star). When programs with higher ratings are broken out further into two groups (Three- and Four-Star fully-rated programs and APR-rated programs), no differences on ECERS-R are seen between the two groups (see Figure 15). And, while these two groups with higher ratings don't differ from each other, they both score significantly better than programs with a One- and Two-Star rating on the ECERS-R.

Figure 15. ECERS-R total scores by Star rating and rating pathway
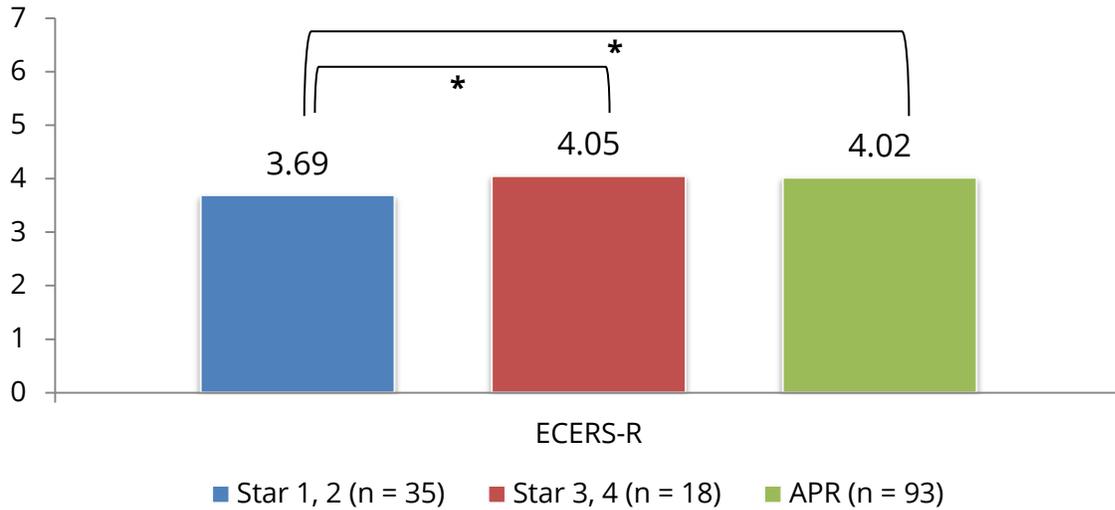
Legend: ■ Star 1, 2 (n = 35) ■ Star 3, 4 (n = 18) ■ APR (n = 93)

Note: Brackets with an asterisk indicate significant differences between groups
Source: Child Trends, Parent Aware Evaluation observation data collected 2012-2015

ECERS-R scores were also analyzed by APR program type (accredited, Head Start, school-based pre-kindergarten programs). Means are presented in Figure 16. All programs with Three- or Four-Star ratings, whether fully-rated or APR of any type had significantly higher ECERS-R scores than programs with lower (One- and Two-Star) ratings.

Figure 16. Mean ECERS-R total score by program type
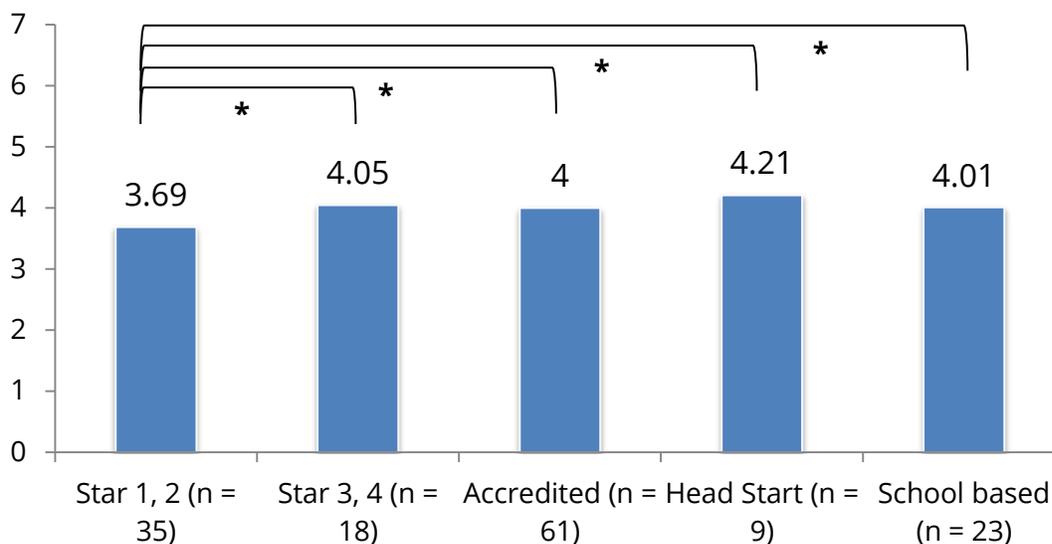
Note: Brackets with an asterisk indicate significant differences between groups

CLASS domain scores were also analyzed in One- and Two-Star, Three- and Four-Star fully-rated, and APR programs separately (see Table 14 and Figure 17).

Table 14. Mean CLASS subscale scores by Star rating

	CLASS - Classroom Organization	CLASS - Emotional Support	CLASS - Instructional Support
Star 1, 2 (n = 59)	6.08	6.23	2.43
Star 3, 4 (n = 72)	6.17	6.34	2.73
APR (n = 130)	6.04	6.23	2.35

Figure 17. CLASS domain scores by Star rating and rating pathway

Note: Brackets with an asterisk indicate significant differences between groups

Three- and Four-Star fully-rated programs scored significantly higher than One- and Two-Star programs and APR programs on CLASS Instructional Support. These differences were not evident when all higher-rated programs were combined and compared to lower-rated programs (see Section 4. Observed Quality and Parent Aware Ratings). No differences by rating pathway were significant for CLASS Emotional Support and CLASS Classroom Organization.

CLASS domain scores were also compared across program types (Three- and Four-Star fully-rated centers, accredited centers, Head Start, and school-based pre-kindergarten programs). Significant differences were found between Three- and Four-Star fully-rated centers and accredited and school-based pre-kindergarten programs (see Figure 18).

Figure 18. CLASS domain scores by program type
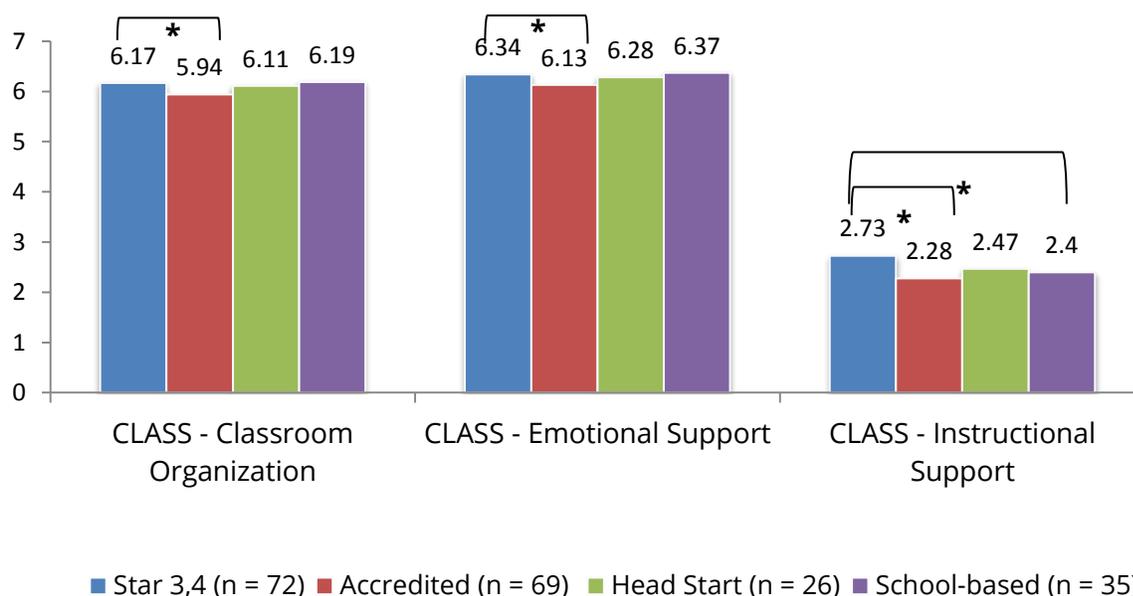
Star 3,4 (n = 72) Accredited (n = 69) Head Start (n = 26) School-based (n = 35)

Note: Brackets with an asterisk indicate significant differences between groups
Source: Child Trends: Parent Aware Evaluation observation data and MN Department of Human Services: Parent Aware implementation observation data, 2012-2015.

Three- and Four-Star fully-rated centers scored significantly higher than accredited centers on all three CLASS domains: Classroom Organization, Emotional Support, and Instructional Support. In addition, Three- and Four-Star fully-rated centers scored significantly higher than school-based pre-kindergarten programs on Instructional Support. Three- and Four-Star fully-rated programs did not differ significantly from Head Start programs on any

CLASS domain. In addition, there were no significant differences on CLASS scores between One- and Two-Star programs and any APR program type (not included in Figure 18).

Next, ECERS-E scores were examined by rating level and rating pathway. Figure 19 displays ECERS-E scores compared across One- and Two-Star rated, Three- and Four-Star fully-rated, and APR. Family child care programs and child care centers are combined in this comparison.

Figure 19. ECERS-E scores by Star rating and rating pathway
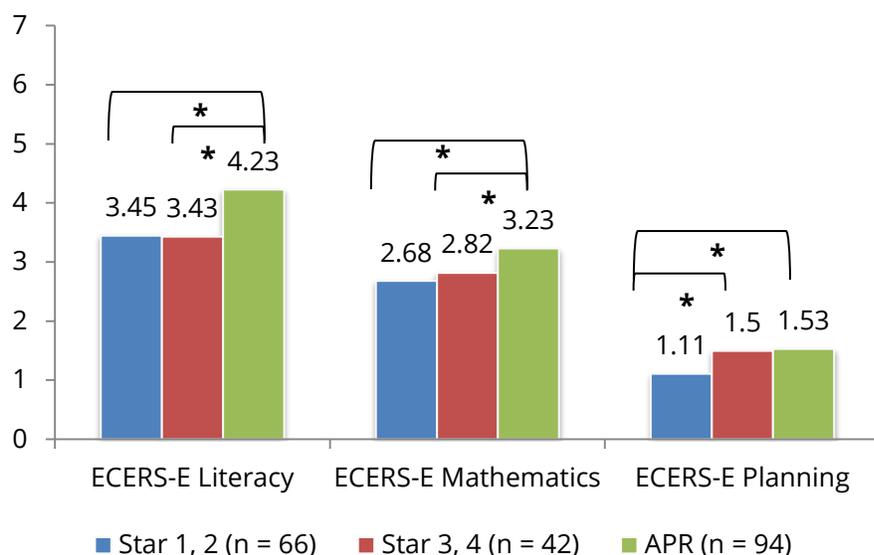
Note: Brackets with an asterisk indicate significant differences between groups
Source: Child Trends, Parent Aware Evaluation observation data collected 2012-2015

Higher-rated (Three- and Four-Star and APR) programs scored significantly higher than lower-rated programs (One- and Two-Star) on planning for individual learning needs. APR programs also scored significantly higher than all other programs (One- and Two-Star and Three- and Four-Star fully-rated) on the ECERS-E literacy and mathematics subscales.

ECERS-E scores were then examined by program type (including family child care and child care centers) and rating level. Results are presented in Table 15, though due to small sample sizes, findings should be interpreted with caution.

Head Start programs scored significantly higher than all other program and rating types on planning for individual needs. In addition, Head Start and school-based pre-kindergarten

programs scored significantly higher than other program and rating types on literacy and mathematics.

Table 15. Mean ECERS-E scores by Star rating and program type

	Centers 1, 2 Star	Centers 3, 4 Stars	Family CC 1, 2 Stars	Family CC 3, 4 Stars	Head Start	School-based Pre-K	Accredited
Planning for individualized needs	1.09	1.61	1.13	1.42	2.94	1.43	1.26
Literacy	3.68	3.88	3.19	3.10	4.43	4.58	3.75
Mathematics	2.71	3.15	2.65	2.57	3.92	3.66	2.86

Source: Child Trends, Parent Aware Evaluation observation data, collected 2012-2015

Children's Development and Rating Pathways

A set of analytic models were estimated to investigate how children's development varies by rating pathway and program type.

First, Propensity Score Matching was used to create matched pairs of children in Three- and Four-Star fully-rated programs and APR programs (see Appendix D: Details about Data and Analytic Methods for details). The purpose of creating matched pairs was to take into account the different demographic characteristics associated with selecting different program types and create groups of children who are similar except for their participation in a Three- or Four-Star rated program or an APR program. HLM models with the controls described in Section 5. Children's Development and Parent Aware Ratings were estimated for each of the developmental gain scores. One significant difference was noted across the nine outcomes examined: children in APR programs had larger gains on social competence than children in Three- and Four-Star fully-rated programs (B = -2.72, SE = 1.27, p < .05). Full tables of results are available in Appendix E: Summary of HLM Analyses.

Next, regression models were estimated by program type (One- and Two-Star rated, Three- and Four-Star fully-rated, accredited, Head Start and school-based pre-kindergarten programs) for each of the developmental gain scores. The full set of controls described in Section 5. Children's Development and Parent Aware Ratings was included. Comparisons were made across each program type. The results are presented in Table 16.

Table 16. Comparisons of children's developmental gains by program/rating type

	Head Start (HS)	School Based (SB)	Accredited Child Care Center (ACCC)	One- and Two-Star fully-rated	Three- and Four-Star fully-rated
Math skills					
Print Knowledge	HS > 3-4 Star HS > ACCC				
Phonological Awareness	HS > SB HS > 1-2 Star HS > ACCC				3-4 Star > ACCC
Expressive Language	HS > ACCC HS > 1-2 Star				
Executive Function					3-4 Star > ACCC
Social Competence	HS > 1-2 Star HS > 3-4 Star HS > ACCC	SB > 1- 2 Star SB > 3- 4 Star	ACCC > 1-2 Star		
Anger Aggression					
Anxiety Withdrawal	HS<1-2 Star				
Persistence					3- 4 Star >1-2 Star

Note: Cells display statistically significant differences between program types on children's gain scores.
Source: Child Trends' child assessment data collection 2012-2015

Findings from Table 16 include:

- Children attending Head Start programs made greater gains than children attending other types of programs on language and literacy skills and social competence.
- Children in Head Start programs also showed a reduction in anxiety withdrawal when compared to children in One- and Two-Star rated programs.
- Children in school based programs had greater gains than children in One- and Two-Star and Three- and Four-Star rated programs on social competence.
- Children in accredited programs had greater gains on social competence than children in One- and Two-Star rated programs.
- Children in Three- and Four-Star rated programs made greater gains on phonological awareness and executive function than children in accredited centers.

- And, children in Three- and Four-Star rated programs made greater gains on persistence than children in One- and Two-Star rated programs.

Summary

The analyses presented by rating pathway (for center-based programs) provide important insights into similarities and differences between programs. On global quality (ECERS-R), all higher rated programs have higher scores than lower rated programs. On the other aspects of observed quality, differences emerged among higher rated programs. Three and Four-Star rated center-based programs have higher scores on Instructional Support than all other program types except Head Start. Notably, Three- and Four-Star fully-rated child care centers and Head Start programs are more knowledgeable about the CLASS than other program types because it is part of their program requirements. Fully-rated Three- and Four-Star centers receive a CLASS observation (and CLASS coaching) as part of the Parent Aware rating process. Head Start programs learn about the CLASS because of its role in the Head Start Designation Renewal process. From the perspective of the early care and education system, it makes sense that these programs stand out from others on their CLASS scores. On the provision of language and math practices, Head Start and school based programs had significantly higher scores than other programs.

The findings on children's development clarified and extended the findings presented in Section 5. Children's Development and Parent Aware Ratings. For example, the models revealed that gains in children's social competence are associated with their participation in APR programs, especially Head Start and school based programs. Language and literacy gains across all three measures examined were associated with participation in Head Start programs.

Section 7. Putting the Findings in Context

Parent Aware plays a critical role in Minnesota's ECE system by providing information to parents and consumers about the quality of early care and education and by providing quality improvement resources for ECE programs. With this role, it is important to determine that the ratings are working as intended through the process of validation. The Parent Aware initial validation study was conducted to assess the extent to which the Parent Aware ratings meet interrelated criteria for being fair, accurate, and meaningful.

The validation study began late in 2012, the first year of statewide expansion of Parent Aware and continued through the first half of the fourth year. Though significant progress has been made in Parent Aware enrollment as described in Section 1. Parent Aware Description, Parent Aware is still in a phase of early implementation. Recruitment for the validation study occurred as programs were still very new to Parent Aware and its requirements, and some were not willing to take on the additional burden of participating in the research. Thus, the sample sizes for some program types in the validation study – particularly licensed family child care programs and non-accredited child care centers – were lower than desired. While initial conclusions can be drawn and used to support refinement of Parent Aware, it will be critical to continue addressing validation questions after Parent Aware has been operating statewide for three to five years.

In this report, multiple analyses were presented to demonstrate whether and how features of observed quality – including developmentally appropriate math and literacy practices, interactions, and learning environments – and children's developmental growth are related to Parent Aware ratings. Taken together, the findings provide initial, positive support for the validity of the Parent Aware ratings. This conclusion is supported by multiple analyses from different sources of evidence.

In Section 2. Parent Aware Validation, we presented a table that described validation questions and hypotheses. That table is included again here as Table 17, and is amended with key findings from the different sections of the report. Further description of findings and implications follow Table 17.

Table 17. Parent Aware validation questions, sources of evidence, hypotheses and validation findings

Key Questions for Validation of Parent Aware	Source of Evidence	Hypothesis	Key Findings
Are the Parent Aware quality indicators consistent with the evidence base on early care and education program quality?	Evidence review[45]	The Parent Aware quality indicators are based on research and best practice according to professional guidelines.	Yes. The evidence base for the Parent Aware indicators is solid, particularly for quality indicators supporting teacher-child interaction and the implementation of curriculum and assessment practices. Support for indicators related to specific training content is less strong.
Do programs seeking full ratings gain points on Parent Aware indicators in expected ways (i.e., showing that they are working on quality indicators across different aspects of quality)?	Analysis of indicators[46] Provider reports of goal ratings[47]	Programs achieve points in each of the quality areas (Physical Health and Well-Being, Teaching and Relationships, Assessment of Child Progress, and Teacher Training and Education) to work toward a Four-Star rating.	No. Programs are selective in the goal ratings they set and the indicators they pursue for a Parent Aware rating. Programs may set a lower goal rating than they could otherwise achieve because they want to work through each level of Parent Aware incrementally, either to provide feasible, attainable goals for their program or to access the maximum amount of quality improvement grants. The implication of this finding is that the lower rating levels of Parent Aware are likely to have greater variation in quality than the higher levels. This variation is expected to diminish over time. Indicators related to assessment and the director's credential are the most likely to be unmet or undocumented (meaning that a program did not attempt to be verified on those indicators). Programs

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[45] The evidence review was conducted collaboratively by Child Trends and the Minnesota Department of Human Services. It is an unpublished document intended to support decision-making.

[46] The indicator analysis was conducted in a separate report and is not included in detail here. Further information is available in the Year 2 and Year 3 reports conducted by the Parent Aware Evaluation team (available at http://www.pasrmn.org/work/research).

[47] See Year 2 Provider perception report available at: http://www.pasrmn.org/work/research.

Key Questions for Validation of Parent Aware	Source of Evidence	Hypothesis	Key Findings
			are most likely to achieve all points on the Physical Health and Well-Being indicators.
Do aspects of observed quality differ in programs with higher ratings?	Observations of program quality	Scores on measures of global quality, teacher-child interactions and practices related to math, literacy, and individualized teaching will be higher in programs with higher ratings.	Yes. Observed quality differs in center-based programs[48] with higher ratings. Global quality scores were higher, and specific practices related to math, literacy, and individualized teaching occurred more frequently in higher-rated programs than in lower-rated programs. No differences in observed quality were found for family child care programs at higher and lower quality levels.
Do measures of observed quality relate in predicted ways to patterns of children's development?	Observations of program quality and assessments of children's development	Observed quality scores will also be associated positively with children's developmental growth.	Yes, on select measures. Measures of global quality were related to language development of low-income children. Specific literacy practices were related to gains in expressive vocabulary and social competence. CLASS instructional support was related to gains in executive function. Each of these quality practices was observed to be occurring at higher levels in programs with higher ratings.
Do patterns of children's developmental gains from fall to spring in the year before Kindergarten align with Parent Aware ratings?	Assessments of children's development	Children in programs with higher ratings will show greater gains in developmental skills than children in programs with lower ratings.	Yes. Children attending higher-rated programs made greater gains from fall to spring of their pre-kindergarten year on social competence and attention/persistence, a measure of children's approach to learning. In addition, low-income children attending higher-rated programs made greater gains on a measure of literacy (print knowledge) and social competence. Though findings linking children's

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[48] "Center-based programs" is a general term to refer to child care centers, Head Start programs and school-based prekindergarten programs.

Key Questions for Validation of Parent Aware	Source of Evidence	Hypothesis	Key Findings
			development and Parent Aware ratings were not pervasive across every outcome examined, associations in the expected direction were noted on three of the five developmental domains examined (language and literacy, social-emotional development, and approaches to learning).
Do patterns of findings with observed quality and children's development look similar for programs with a Three- or Four-Star full-rating and programs with an Accelerated Pathway to Rating?	Rating data, by pathway status	Associations with observed quality and children's development will look similar for programs, regardless of rating pathway.	The findings were mixed. Differences by rating Pathway were observed. On balance however, the differences were not systematic and indicate that the APR process is producing ratings that are functionally equivalent to full-ratings. CLASS Instructional Support scores are higher in Three- and Four-Star rated programs than in other fully-rated and APR programs, except Head Start. School-based programs and Head Start programs had significantly higher scores than other programs on specific literacy and math practices. Thus, some findings favor fully-rated programs and others favor APR programs.

Source: Child Trends' analysis

Key Findings and Implications

Patterns of Children's Development

The Parent Aware validation study offers a unique opportunity to observe patterns of development in a large sample of children from across Minnesota. Though the sample was not designed to be representative of all children, it includes children from a variety of early care and education programs and a high proportion of children from low-income families. Both sample features are important for informing policy decisions about Minnesota's early care and education system.

The analysis focused on the extent to which children showed improvements over time on developmentally appropriate assessments of their skills. This strategy acknowledges that children have different starting points and thus may grow and change on the assessments at different rates. For children who start behind their peers, it is helpful to track whether

they are able to make up ground and approach national averages on assessments during the course of the year before kindergarten.

Key findings about child development include:

- Children in Parent Aware-rated programs made gains from fall to spring of their pre-kindergarten year on skills that are critical for their school readiness: math skills, language and literacy skills, social competence, persistence, and executive function. Gains in language and literacy and executive function were greater for children from low-income families than for children from higher-income families, though spring scores for low-income children were still equal to or lower than fall scores for higher-income children.
- Low-income children scored significantly lower on a composite measure of basic concepts such as understanding of color, size, and counting (administered in the spring only). Low-income children also were more likely to be either over- or under-weight than the sample of children from higher-income families.

The findings on children's development are both encouraging and a source of concern. Even though the time between fall and spring assessments is quite short, children in Parent Aware programs are making significant gains on key skills. Across the sample, children from low- and higher-income families are at or above the national averages on measures of math and language skills. The gap in assessment scores by family income, however, is of concern, and the results of the basic concepts screener and weight category screener indicate that greater supports are needed for children from low-income families. Parent Aware can be used as a foundation for providing additional resources to Parent Aware programs serving low-income children. These supports may include training and coaching that promotes more effective individualizing of instruction and interactions. In addition, supports for children's health and development may be enhanced through sustained coordination with Child Care Health Consultants (a service which is available currently through RTT-ELC grant funds).

Observed Quality in Parent Aware Rated Programs
Ratings that are *accurate* reflect and distinguish the quality of services available to children and families in the program. For the Parent Aware validation analyses, we hypothesized that the learning environment, interactions, and experiences of children in programs with a high rating would look different from those in programs with a low rating.

Key findings about observed quality include:

- On four of the seven measures of observed quality examined, center-based programs with higher Star ratings– those with Three- and Four-Star ratings – demonstrated higher scores than programs with lower ratings– those with One- and Two-Star ratings. The differences were noted on a measure of global quality (the ECERS-R, which includes the learning environment and provisions for children's daily routines and activities) and measures of specific practices to support children's math, literacy, and individualized learning (the ECERS-E). No differences between rating levels were found on the CLASS domains which assess the quality of teacher-child interactions. These findings provide initial support for the validity of the ratings. We conclude that Parent Aware is functioning to differentiate quality in center-based programs. At this early stage of implementation, major changes to the process for determining ratings levels are not warranted by the validation findings for center-based programs, though the magnitude of observed quality differences is small.
- No differences between programs by Star rating level were noted for family child care programs on the four measures we examined. The measures include a global quality measure (the FCCERS-R, which is similar to the ECERS-R but is tailored for family child care programs and measures the learning environment and provisions for children's routines and activities) and the measures of specific practices to support math, literacy, and individualized learning (the ECERS-E).

A number of explanations are possible for the lack of differentiation among quality levels for family child care programs. First, the sample sizes for family child care programs in the evaluation were lower than desired. It is possible that the sample represented a select group of family child care programs that was willing to participate in the evaluation, but was not necessarily representative of other family child care programs in Parent Aware (among which a greater diversity of observed quality may have been evident). Alternatively, evidence from other evaluation activities (including analyses of provider perceptions of Parent Aware; see Child Trends, 2014) suggests that family child care providers may have chosen to work incrementally through the Parent Aware rating levels, even though they may have been able to achieve a higher Star rating. They may have wanted to access the financial incentives associated with achieving each rating level, or they may have chosen to set goals that could be met more feasibly within the rating timeframe (rather than tackle the multiple indicators at the highest rating level). In either scenario, we would expect to see less differentiation across the quality levels since the group with lower ratings includes those who are able to meet higher quality indicators, but are choosing instead to work

through the rating process at a slower pace. Over time, the quality levels may be more differentiated as those programs move to higher Parent Aware levels.

Even with plausible explanations for the lack of differentiation among family child care quality levels, it is important to consider options for strengthening Parent Aware ratings for family child care programs. These strategies could include collection of on-site observations, similar to the rating process used for child care centers seeking a Three- or Four-Star rating. However, given the cost of implementing observations in family child care programs as part of the rating process,[49] a field test could be conducted first to examine the effectiveness of different options and measures. The availability of measures to capture quality in family child care programs is limited. It will be useful to confer with other states and review the results of forthcoming validation studies to learn about the functioning of different measures in family child care programs. Some states are using the FCCERS-S in family child care programs while others (Oregon, for example) are using a modified CLASS protocol (which is typically used only in center-based programs) in family child care programs. Different sources of evidence could be examined to inform this important decision.

Linkages between Ratings, Observed Quality and Children's Development
Ratings that are *meaningful* measure and promote the elements of quality that link to the outcomes targeted by the QRIS. Because Parent Aware aims ultimately to support the positive development of young children, it is important to examine whether and how ratings – and the quality promoted by the ratings – are associated with children's developmental outcomes.

Key findings about ratings, observed quality and children's development include:

- Children attending higher-rated programs made greater gains from fall to spring of their pre-kindergarten year on social competence and attention/persistence, a measure of children's approach to learning. In addition, low-income children attending higher-rated programs made greater gains on a measure of literacy (print knowledge) and social competence. Though findings linking children's development and Parent Aware ratings were not pervasive across every outcome examined, associations in the expected direction were noted on three of the five developmental domains examined (language and literacy, social-emotional development, and approaches to learning).

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[49] For details about cost estimates, see The Parent Aware Quality Rating and Improvement System: Increasing Accessibility for Families and Early Care and Education Programs (pages 28-29) available at: https://mn.gov/dhs/images/Parent_Aware_Accessibility_Report.pdf

- Further exploration of observed quality and children's development indicated positive associations though we note that there were relatively few significant findings given the number of models tested. The following associations were noted:
  - CLASS Instructional Support was associated with growth on executive function.
  - Global quality scores in center-based programs (ECERS-R) were associated with gains on language skills (print knowledge and phonological awareness) for low-income children. And, higher rated programs scored higher on the ECERS-R than lower rated programs.
  - ECERS-E literacy practices were related to gains in expressive vocabulary. And higher rated programs had higher ECERS-E literacy scores than lower rated programs.
- Thus, while the models examining ratings and child development showed only one linkage in the domain of language and literacy development (with low-income children gaining more on print knowledge in higher quality programs), the analysis of observed quality provides initial indications that practices engaged in by programs at higher rating levels were positively associated with all three measures of children's language development.

Taken together, the findings provide positive, initial support for the validity of the Parent Aware ratings in supporting meaningful quality differences that are related to children's development in expected ways.

Parent Aware Rating Pathways

Ratings that are *fair* are produced from a reliable, equitable process. Because Parent Aware provides two enrollment pathways for programs, it is important to examine the extent to which these pathways are producing ratings that are functionally equivalent. Licensed, non-accredited child care centers and family child care programs enroll in the full-rating pathway and receive a One- to Four-Star rating. Accredited programs, Head Start/Early Head Start programs and school-based pre-kindergarten programs are eligible to enroll in the Accelerated Pathway to Ratings (APR) process that has fewer quality indicators and does not include an on-site observation. The APR process results in a Four-Star rating. The validation study examined observed quality and children's development by rating pathway.

The analyses presented by rating pathway (for center-based programs) provide important insights into similarities and differences between programs and have implications for assessing the effectiveness of the APR process.

Key findings on rating pathways include:

- On global quality, Three- and Four-Star fully-rated programs and APR programs had nearly identical scores, and both scored higher than One- and Two-Star rated programs on the ECERS-R. This finding on global quality held when APR programs were analyzed by program type (accredited center-based programs, Head Start and school-based pre-kindergarten programs).
- On the other aspects of observed quality, differences emerged among higher rated programs with full-ratings and APR ratings. Three and Four-Star rated child care centers program had higher scores on Instructional Support than all other program types except Head Start. Notably, Three- and Four-Star fully-rated child care centers and Head Start programs are likely more knowledgeable about the CLASS tool than other program types because it is part of their program requirements: Fully-rated Three- and Four-Star centers receive a CLASS observation and CLASS coaching as part of the Parent Aware rating process while Head Start programs learn about the CLASS because of its role in the Head Start Designation Renewal process. From the perspective of the early care and education system, it makes sense that these programs are distinct from others on their CLASS Instructional Support scores (though note that Head Start scores were not significantly higher than One- and Two-Star programs or any other APR program type). Accredited programs and school-based pre-kindergarten programs did not score higher on the CLASS domains than One- and Two-Star rated programs.
- On Planning for Children's Individualized Needs, APR programs and Three- and Four-Star fully-rated programs scored higher than One- and Two-Star programs. On Literacy and Math practices, APR programs overall had higher scores than One- and Two-Star rated programs and Three- and Four-Star rated programs. Head Start and school-based programs had significantly higher scores on literacy and math than other program types, and Head Start scored higher than other program types on planning for individualized needs.
- The findings on children's development and rating pathways clarified and extended the findings on ratings and children's development. For example, the models revealed that gains in children's social competence are associated with their participation in APR programs, especially Head Start and school based programs. Language and literacy gains across all three measures examined were associated with participation in Head Start programs.

Overall, the Accelerated Pathway to Rating appears to function effectively to identify programs that engage in practices to support school readiness, particularly for low-income children. APR programs and Three- and Four-Star rated programs both have strengths,

according to the observational data and findings on children's development. On balance, the differences between rating pathways are not systematic; on some measures, the differences favor APR programs, and on other measures the differences favor fully-rated programs. The differences noted by program type across the APR programs suggest that there are strengths in Head Start and school-based pre-kindergarten programs compared to accredited centers and Three-Star and Four-Star rated centers. These differences, however, are not of sufficient magnitude to indicate that different tiers of quality exist within APR programs. For example, the average scores on the quality measures examined in this study – even when programs are examined by rating level – are not in the highest range for the measures identified by the developers (scores above a 5 on the ECERS-R and ECERS-E, and scores above a 3 on the CLASS Instructional Support domain). If the measures were used in professional development efforts and incorporated more fully into the early care and education system as quality improvement tools, scores may improve over time.

Similarly, the findings do not indicate that APR programs would be differentiated more successfully by requiring a full-rating process with the current set of Parent Aware indicators. If specific strategies were put in place to address and improve quality in APR programs or to target different quality practices, it may make sense to incorporate a rating process that is not "accelerated" and that could potentially capture resulting quality differences among APR programs (perhaps identifying programs that exceed the requirements at the highest rating level). However, without targeted quality improvement approaches in place for APR programs or new Parent Aware rating criteria specifying advanced practices and interactions (such as the literacy, math and individualized teaching practices observed in this study), the investment in additional rating criteria for these programs may not be warranted.

The findings do indicate that across all quality levels, program types and rating pathways, programs in Parent Aware, including those that have achieved a Three- or Four-Star full-rating and APR programs, could benefit from quality improvement efforts. In particular, average scores on Instructional Support, specific math and literacy practices and planning for individualized needs are in the low range (though they are consistent with the scores documented in other national studies). Investments in improvement strategies to strengthen these practices could support changes in practices that are likely to bolster children's development.

Coaching to help teachers and caregivers improve their practices with children is a promising quality improvement strategy to promote in Parent Aware. The validation study provides evidence to suggest that the CLASS coaching received by center-based programs seeking a Three- or Four-Star rating is supporting higher scores on CLASS Instructional

Support. CLASS coaching is not provided to family child care programs or to programs in the APR pathway. Expanding CLASS coaching to these programs may be valuable, even if CLASS scores are not included in their rating. CLASS coaching (or other coaching to support teaching practices) could be made available to programs as part of a continuous quality improvement process through which programs develop improvement plans and action steps that are supported by coaches and/or participation in training but are not included in the rating process.

Limitations of the Validation Study

In reviewing the validation results in this report, it is important to consider the context of Parent Aware implementation from the fall of 2013 through the summer of 2015 when the bulk of data collection occurred for the analyses presented. At that time, Parent Aware was in its second and third year of statewide expansion. Implementation research conducted for the Year 1 and Year 2 evaluation reports indicates that Parent Aware policies, procedures and rating processes were still being refined (Tout et al, 2013). Thus, minor inconsistencies in the rating process are likely and may indicate that ratings in the early years of Parent Aware are less reliable than those being issued later when policies and procedures became more standardized. These potential concerns should be factored in when interpreting the results.

In addition, the analyses in this report focus on the experiences of children in the year before they enter kindergarten. Though Parent Aware is open to programs serving children beginning at birth, resource limitations for the validation study did not permit inclusion of infants and toddlers. Future work should focus on addressing the extent to which the Parent Aware ratings are capturing the features of quality that support the positive development of infants and toddlers. Similarly, children with special needs and children who could not be assessed using tools administered in English[50] are not included in the study. Efforts to understand the experience of these children in Parent Aware programs should be included in future research.

In addition, sample sizes were limited for certain types of programs. In particular, the sample size of fully-rated family child care programs is relatively small compared to the number of programs included in the APR sample. Though these numbers represented the distribution of programs in Parent Aware during the time of recruitment for the evaluation,

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[50] Fewer than 20 of the recruited children were not assessed in this study because of low English proficiency. However, we anticipate that greater numbers of children speaking languages other than English will participate in Parent Aware-rated programs over time and should be included in evaluation efforts.

family child programs in 2015 are the most rapidly growing program type in Parent Aware. If resources are available to support further evaluation, it will be important to conduct additional observations in family child care programs that represent the full range of programs now rated in Parent Aware.

Conclusion

Overall, the results of the validation study suggest that Parent Aware has integrity as a framework for building and connecting efforts to support all types of early care and education programs in Minnesota. The findings can be used to refine the system and to chart a course for the future. Ongoing monitoring and evaluation should be conducted to support continuous improvement and to ensure that Parent Aware is achieving its goals for Minnesota's children and families.

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Appendix A: Parent Aware Indicators and Scoring Criteria for Child Care Centers and Family Child Care

Eligible programs:

- Licensed child care centers

Indicators and scoring details:

Prerequisite: Be licensed and have no current negative actions. Negative actions include maltreatment determinations, conditional license, suspensions, temporary immediate suspensions and revocations. Fines will not disqualify your program from participating.

Required Indicators to earn a One-Star Rating
Physical health and well-being   **PH1a**. Provides all families with contact information for health and screening services, including but not limited to: • Dental   • Mental health services   • Early Childhood Special Education (ECSE)   • Early Childhood Screening
Teaching and relationships   **TR1a.** Provides families with contact information for one or more local family education options, including but not limited to Early Childhood Family Education (ECFE) programs   **TR1b.** All lead teachers have completed at least 8 hours of child development training
Assessment of child progress   **AC1a.** All lead teachers have completed at least 2 hours of training, coaching, consultation or mentoring on authentic observation practices   **AC1b.** Observes children regularly and records information at least monthly
Teacher training and education   **TT1a**. All lead teachers have submitted verified training and professional development credentials

Required Indicators to earn a Two-Star Rating
All indicators for One-Star, plus the following:
Physical health and well-being   **PH2a.** Provides all families with local contact information for family support services, including but not limited to: • Child Care Assistance Program (CCAP)   • Early Learning Scholarships, if they are available in your area   • Minnesota Family Investment Program (MFIP)   • Health care coverage (Medical Assistance, MinnesotaCare or Advanced Premium Tax Credit)   • Public health services

PH2b. Conducts self-assessment of the environment and develops goals in areas of need, with priority given to items in the foundational quality section
Teaching and relationships
TR2a. Offers orientation meetings for new parents that include a discussion about their preferences, including those related to family traditions and customs
TR2b. Uses lesson plans and a daily schedule
TR2c. All lead teachers have completed a total of at least 8 hours of training on the Minnesota Early Childhood Indicators of Progress (ECIPs)
Assessment of child progress
AC2a. Gives families copies of observation summaries prepared using authentic observation practices
Teacher training and education
TT2a. All lead teachers have professional development plans

Programs meeting all Indicators for One- and Two-Stars are eligible to apply for a higher Star Rating. The following points and requirements must be met to earn Three- and Four-Star Ratings.

Total points possible: 20

Points in all four categories of Indicators are totaled. Star Ratings are awarded using the following scale and requirements:

Three-Star Rating	8 – 14.5 points	All indicators for One- and Two-Star Ratings, plus the following: • Scored at least a 2.0 or higher on the Instructional Support category of the CLASS (TR3e) • Uses a curriculum aligned with the Minnesota Early Childhood Indicators of Progress (ECIPs) in all classrooms (TR3a) • All lead teachers have completed at least 8 hours of training, coaching, consultation or mentoring on implementing curriculum (TR3a) • All lead teachers have completed at least 8 hours of training, coaching, consultation or mentoring on authentic child assessment (AC3a) • Uses approved assessment tool(s) with all children in at least one age group (AC3b) • Completes at least two domains in approved assessment tool(s) used (AC3c) • Uses an approved assessment tool(s) at least once per year (AC3d) • Has scored at least one point in every category
Four-Star Rating	15 – 20 points	All indicators for One-, Two, and Three-Star Ratings, plus the following: • Scored at least a 2.5 or higher on the Instructional Support category of the CLASS (TR3e) • Uses approved assessment tool(s) with all children in all age groups (AC3b)

Physical health and well-being	Points possible
PH3a. Has a plan for assisting families with accessing family support services, including but not limited to: • Child Care Assistance Program (CCAP) • Early Learning Scholarships, if they are available in your area • Minnesota Family Investment Program (MFIP) • Health care coverage (Medical Assistance, MinnesotaCare or Advanced Premium Tax Credit) • Public health services	1 point
PH3b. The program participates in the Minnesota Child and Adult Care Food Program (CACFP) **OR** All lead teachers have completed at least 3 hours of training on child nutrition, AND program gives families copies of written guidelines about the importance of providing healthy meals and copies of sample menus	1 point
PH3c. All lead teachers have completed at least 3 hours of training on obesity prevention, including developmentally appropriate physical activities for young children	2 point
Total possible	**4 points**

Teaching and relationships	Points possible
TR3a. Uses a curriculum that is aligned with the Minnesota Early Childhood Indicators of Progress (ECIPs) in all classrooms **AND** All lead teachers have completed at least 8 hours of training, coaching, consultation or mentoring on implementing curriculum	Required for all classrooms to earn a Three-Star Rating or higher
TR3b. All lead teachers have a total of 4 hours of training or equivalent coaching, consultation or mentoring in one or a combination of the following: • Children's developmental disabilities • Special health care needs • Behavioral challenges	1 point
TR3c. All lead teachers have a total of 4 hours of training or equivalent coaching, consultation or mentoring on supporting young children's learning and development in one or a combination of the following areas: • Social and emotional • Language and literacy • Mathematical thinking • Physical development	1 point
TR3d. Demonstrates ability to communicate program information in parent's primary language (for example, through on-site staff, qualified volunteers, an interpreter service or translated materials)	1 point

OR All lead teachers have completed at least 6 hours of training in working with families from different cultures and socio-economic levels	

TR3e. CLASS scores (preschool and preschool/toddler classrooms only)
In the Emotional Support category, if score is between 1 and 3.99
     If score is between 4 and 5.59
     If score is between 5.60 and 7
 	
In the Instructional Support category, if score is between 1 and 2.49
     If score is between 2.50 and 2.99
     If score is between 3 and 7
 	
In the Classroom Organization category, if score is between 1 and 2.59
     If score is between 2.60 and 3.59
     If score is between 3.60 and 7
 	
All preschool and toddler classrooms must receive a CLASS score of 2 or higher in the Instructional Support category of the CLASS to achieve 3 stars, and 2.5 or higher to achieve 4 stars.
	0 points
	.5 points
	1 point
	
	0 points
	.5 points
	1 point
	
	0 points
	.5 points
	1 point
	
	Up to 3 points possible

Total possible	**6 points**

Assessment of child progress	Points possible
AC3a. All lead teachers have completed at least 8 hours of training, coaching, consultation or mentoring on authentic child assessment	Required to earn a Three-Star Rating or higher
AC3b. Uses approved child assessment tool(s) with all children in at least *one age group* **OR** Uses approved assessment tool(s) with all children in *all age groups*	Required to earn a Three-Star Rating or higher Required to earn a Four-Star Rating 4 stars
AC3c. Completes at least *two domains* in approved assessment tool(s) used by program **OR** Completes *all domains* in approved assessment tool(s) used by program	Required to earn a Three-Star Rating or higher 1 point
AC3d. Uses approved assessment tool(s) at least *once per year* **OR** Uses approved assessment tool(s) at least *twice per year*	Required to earn a Three-Star Rating or higher 1 point
AC3e. Provides families with child assessment results **AND**	1 point

If a child has an Individualized Education Plan (IEP) or Individual Family Services Plan (IFSP), shares assessment results with team with family's permission. For a child with a special need who is receiving specialty services (for example, physical or occupational therapy), shares assessment results with service providers with family's permission.	
AC3f. Uses child assessment information to design goals and guide instruction for individual children	1 point
Total possible	**4 points**

Teacher training and education	Points possible
TT3a. Education coordinator, director or lead administrator has a bachelor's degree with at least 24 early childhood-related, verified semester credits Definition of "education coordinator": An education coordinator is the individual (director, lead administrator, lead teacher or other staff) whose responsibilities include helping the program implement curriculum consistently across all classrooms, and any other practices related to helping children become ready for school. (This is often the staff person who approves the child care program plan as required by Rule 3.)	1 point
TT3b. Director has a director's credential	1 point

TT3c. Staff training and education are recorded and documented through Develop (Minnesota's Quality Improvement and Registry Tool) (http://www.developtoolmn.org)
 	
Points are awarded based on the steps achieved in the Career Lattice (http://www.mncpd.org/docs/new_career_lattice_v4_6-9-11.pdf). For each lead teacher, points will be awarded as follows: 1 point awarded for step 1, 2 points for step 2, and so on through 10 points awarded for step 10 or higher, then averaged:
    Average score is 5.00 or less
    Average score is between 5.01 and 6.00
    Average score is between 6.01 and 7.00
    Average score is between 7.01 and 9.00
    Average score is between 9.01 and higher
 	
Definition of "lead teacher:"
A lead teacher is the highest qualified teacher who works in a classroom during at least 50% of the program's operating hours.
	0 points
	1 point
	2 points
	3 points
	4 points

Total possible	**6 points**

Eligible programs:

- Licensed family child care providers

Indicators and scoring details:

Prerequisite: Be licensed and have no current negative actions. Negative actions include maltreatment determinations, conditional license, suspensions, temporary immediate suspensions and revocations. Fines will not disqualify you from participating.

Required Indicators to earn a One-Star Rating
Physical health and well-being **PH1a**. Provides all families with contact information for health and screening services, including but not limited to: • Dental • Mental health services • Early Childhood Special Education (ECSE) • Early Childhood Screening
Teaching and relationships **TR1a.** Provides families with contact information for one or more local family education options, including but not limited to Early Childhood Family Education (ECFE) programs **TR1b.** All lead child care providers have completed at least 8 hours of child development training
Assessment of child progress **AC1a.** All lead child care providers have completed at least 2 hours of training, coaching, consultation or mentoring on authentic observation practices **AC1b.** Observes children regularly and records information at least monthly
Teacher training and education **TT1a**. All lead child care providers have submitted verified training and professional development credentials

Required Indicators to earn a Two-Star Rating
All indicators for One-Star, plus the following:
Physical health and well-being **PH2a.** Provides all families with local contact information for family support services, including but not limited to: • Child Care Assistance Program (CCAP) • Early Learning Scholarships, if they are available in your area • Minnesota Family Investment Program (MFIP) • Health care coverage (Medical Assistance, MinnesotaCare or Advanced Premium Tax Credit) • Public health services **PH2b.** Conducts self-assessment of the environment and develops goals in areas of need, with priority given to

items in the foundational quality section.		

Teaching and relationships

TR2a. Offers orientation meetings for new parents that include a discussion about their preferences, including those related to family traditions and customs

TR2b. Uses lesson plans and a daily schedule

TR2c. All lead child care providers have completed a total of at least 8 hours of training on the Minnesota Early Childhood Indicators of Progress (ECIPs)

Assessment of child progress

AC2a. Gives families copies of observation summaries prepared using authentic observation practices

Teacher training and education

TT2a. All lead child care providers have professional development plans

Programs meeting all Indicators for One- and Two-Stars are eligible to apply for a higher Star Rating.
The following points and requirements must be met to earn Three- and Four-Star Ratings.

Total points possible: 20

Points in all four categories of indicators are totaled. Star Ratings are awarded using the following scale:

Three-Star Rating	8 – 14.5 points	All indicators for One- and Two-Star Ratings,, plus the following: • Uses a curriculum aligned with the Minnesota Early Childhood Indicators of Progress (ECIPs) (TR3a) • All lead providers have completed at least 8 hours of training, coaching, consultation or mentoring on implementing curriculum (TR3a) • All lead providers have completed at least 8 hours of training, coaching, consultation or mentoring on authentic child assessment (AC3a) • Uses approved assessment tool(s) with all children in at least one age group (AC3b) • Completes at least two domains in approved assessment tool(s) used (AC3c) • Uses an approved assessment tool(s) at least once per year (AC3d) • Provider has achieved at least a Step 2 in the Minnesota Career Lattice, which requires a high school diploma or GED (TT3a) • Has scored at least one point in every category
Four-Star Rating	15 – 20 points	All indicators for One-, Two, and Three-Star Ratings, plus the following: • Uses approved assessment tool(s) with all children in all age groups (AC3b)

Physical health and well-being	Points possible
PH3a. Has a plan for assisting families with accessing family support services, including but not limited to: • Child Care Assistance Program (CCAP) • Early Learning Scholarships, if they are available in your area • Minnesota Family Investment Program (MFIP) • Health care coverage (Medical Assistance, MinnesotaCare or Advanced Premium Tax Credit) • Public health services	1 point
PH3b. The provider participates in the Minnesota Child and Adult Care Food Program (CACFP) **OR** All lead child care providers have completed at least 3 hours of training on child nutrition, AND provider gives families copies of written guidelines about the importance of providing healthy meals and copies of sample menus	1 point
PH3c. All lead child care providers have completed at least 3 hours of training on obesity prevention, including developmentally appropriate physical activities for young children	2 point
Total possible	**4 points**

Teaching and relationships	Points possible
TR3a. Uses a curriculum that is aligned with the Minnesota Early Childhood Indicators of Progress (ECIPs) **AND** All lead child care providers have completed at least 8 hours of training, coaching, consultation or mentoring on implementing curriculum (required for all classrooms to earn a Three-Star Rating or higher)	2 points
TR3b. All lead child care providers have a total of 4 hours of training or equivalent coaching, consultation or mentoring in one or a combination of the following: • Children's developmental disabilities • Special health care needs • Behavioral challenges	1 point
TR3c. All lead child care providers have a total of 4 hours of training or equivalent coaching, consultation or mentoring on supporting young children's learning and development in one or a combination of the following areas: • Social and emotional • Language and literacy • Mathematical thinking • Physical development	1 point
TR3d. Demonstrates ability to communicate program information in parent's primary language (for example, through on-site staff, qualified volunteers, an interpreter service or translated materials)	1 point

OR	
All lead child care providers have completed at least 6 hours of training in working with families from different cultures and socio-economic levels	
Total possible	**5 points**

Assessment of child progress	Points possible
AC3a. All lead child care providers have completed at least 8 hours of training, coaching, consultation or mentoring on authentic child assessment	Required to earn a Three-Star Rating or higher
AC3b. Uses approved child assessment tool(s) with all children in at least *one age group* **OR** Uses approved assessment tool(s) with all children in *all age groups*	Required to earn a Three-Star Rating or higher Required to earn a Four-Star Rating
AC3c. Completes at least *two domains* in approved assessment tool(s) used **OR** Completes *all domains* in approved assessment tool(s) used	Required to earn a Three-Star Rating or higher 1 point
AC3d. Uses approved assessment tool(s) at least *once per year* **OR** Uses approved assessment tool(s) at least *twice per year*	Required to earn a Three-Star Rating or higher 1 point
AC3e. Provides families with child assessment results **AND** If a child has an Individualized Education Plan (IEP) or Individual Family Services Plan (IFSP), shares assessment results with team with family's permission. For a child with a special need who is receiving specialty services (for example, physical or occupational therapy), shares assessment results with service providers with family's permission.	1 point
AC3f. Uses child assessment information to design goals and guide instruction for individual children	1 point
Total possible	**4 points**

Teacher training and education	Points possible

TT3a. Provider training and education are recorded and documented through Develop (Minnesota's Quality Improvement and Registry Tool) (http://www.developtoolmn.org)
 	
Points are awarded based on the steps achieved in the Career Lattice http://www.mncpd.org/docs/new_career_lattice_v4_6-9-11.pdf. Based on the steps achieved in the Career Lattice, points are awarded:
        Step 2 in the Minnesota Career Lattice (required to earn a Three-Star Rating or higher)
        Step 3 in the Minnesota Career Lattice
        Step 4 in the Minnesota Career Lattice
        Step 5 in the Minnesota Career Lattice
        Step 6 in the Minnesota Career Lattice
        Steps 7 - 8 in the Minnesota Career Lattice
        Step 9 or higher in the Minnesota Career Lattice
 	
Definition of "lead child care provider:"
The highest qualified person working with children at least 50% of the program's operating hours.
	1 point
	2 points
	3 points
	4 points
	5 points
	6 points
	7 points

Total possible	**7 points**

Indicators and Scoring
Accelerated Pathway to Rating

Accelerated Pathway to Rating is a streamlined process to earn a Four-Star Parent Aware Rating. This option is available because the requirements of child care accreditation, Head Start, public school pre-kindergarten programs, Early Childhood Special Education, or charter school early learning programs officially recognized by the Minnesota Department of Education mirror or exceed the requirements of the Parent Aware Full Rating process.

Eligible programs

- Licensed child care centers with an approved accreditation (see list of approved accreditations below)
- Licensed family child care programs with an approved accreditation (see list of approved accreditations below)
- License-exempt public school pre-kindergarten programs meeting School Readiness standards
- License-exempt charter school early learning programs officially recognized by the Minnesota Department of Education
- License-exempt Early Childhood Special Education programs
- Licensed and license-exempt Early Head Start and Head Start programs meeting Head Start performance standards

Indicators and Scoring Details

Prerequisite: Be licensed and have no current negative actions. Negative actions include maltreatment determinations, conditional license, suspensions, temporary immediate suspensions and revocations. Fines will not disqualify your program from participating. This requirement does not apply to license-exempt programs.

Four Star accelerated rating – required indicators
Teaching and relationships   Uses a curriculum that is aligned with the Minnesota Early Childhood Indicators of Progress (ECIPs)   AND   All lead child care providers/lead teachers have completed at least 8 hours of training, coaching, consultation or mentoring on implementing curriculum
Assessment of child progress   Uses approved assessment tool(s) at least *twice per year*   AND

Completes all domains in approved assessment tool(s) used by program

AND

Uses approved assessment tool(s) with all children in all age groups

AND

All lead child care providers/lead teachers have completed at least 8 hours of training, coaching, consultation or mentoring on authentic child assessment

Approved Accreditations for Child Care Centers
- Accredited Professional Preschool Learning Environment (APPLE)
- AdvancED – Early Learning Accreditation
- American Montessori Society (AMS) School Accreditation
- Association of Christian Schools International (ACSI) Accreditation
- Association of Montessori International (AMI) – Montessori School Recognition
- Council on Accreditation (COA) – Early Childhood Education Program Accreditation
- Green Apple Accreditation of Children's Services (GAACS) – Early Education Center (EEC) Accreditation
- National Accreditation Commission (NAC) for Early Care and Education Programs Accreditation
- National Association for the Education for Young Children (NAEYC) Accreditation
- National Early Childhood Program Accreditation (NECPA) Accreditation

Approved Accreditation for Family Child Care Providers
- National Association for Family Child Care (NAFCC)

Definition of "lead teacher":

The lead teacher is the highest qualified teacher who works in a classroom during at least 50% of the program's operating hours.

Definition of "lead child care provider":

The lead child care provider is the highest qualified provider who works with children at least 50% of the program's operating hours.

Appendix B: Sampling, Recruitment, and Data Collection Methods

Program Sampling and Recruitment

Programs were recruited into the Parent Aware Evaluation over a three year period. Recruitment into the first cohort began in the fall of 2012. Recruitment into the second cohort began in the summer of 2013 and continued through the fall of 2013. Recruitment into the third cohort began in the winter of 2014 and continued through the fall of 2014. A final recruitment effort to supplement the sample of programs with observation data occurred during the summer of 2015.

Researchers initiated contact with programs by mailing them a letter introducing Child Trends and explaining the purpose of the evaluation. The letter also briefly described the two primary research activities: observation(s) and child assessments. The research team followed up with programs by phone and by email. Researchers discontinued follow-up phone calls and emails in November of each study year. If a program did not respond to multiple phone calls or emails, the research team contacted the program the following year (cohorts one and two only) to ask if they were interested in participating in the evaluation. During telephone conversations with programs, researchers explained in more detail the evaluation activities. Center-based programs were asked to participate in a CLASS and/or ECERS-R observation. Researchers targeted the classroom that served the most four-year-old children. If more than one classroom served preschoolers, the research team randomly selected one classroom. Center staff were asked to distribute information about the study to all parents of four-year-old children in the classroom. Center staff were asked to collect completed consent forms from families and mail them to Child Trends.

Child Trends obtained fully-rated providers' contact information from the Department of Human Services. During the first year of the evaluation, Child Trends recruited programs going through the Parent Aware rating process. However, beginning in the second year of the evaluation, Child Trends only contacted programs after they had received their rating. This change was made in an effort to give programs an opportunity to devote their efforts to the rating process and for researchers to ensure that only rated programs participated in the evaluation.

Over the three year recruitment window, researchers contacted various types of programs to ask them to participate in the evaluation. Family child care providers and child care

center directors were mailed a letter and received a follow-up phone call about the evaluation. Researchers described the purpose of the evaluation and explained the research activities. Programs were asked to participate in on-site observations, online surveys, and child assessments. Programs could choose to participate in some, none, or all of the activities. At any point in the evaluation, programs could withdraw from the evaluation.

The research team contacted all Parent Aware fully-rated programs during recruitment. Fully-rated programs were prioritized. Multiple attempts were made in an effort to make direct contact with all fully-rated programs in order to verify their interest in participation. The research team also contacted programs participating in the Accelerated Pathway to Rating (APR) process. All types of APR programs were asked to participate, including accredited child care center-based programs, accredited family child care programs, school-based pre-kindergarten programs, and Head Start programs. Different recruitment methods were used for the various program and pathway types.

Fully-Rated Child Care Programs

Child Trends contacted approximately 656 fully-rated programs to ask them to participate in the evaluation. Fully-rated centers were only eligible to participate if they served preschoolers. Centers serving infants and toddlers only were not eligible. Fully-rated center-based programs in Parent Aware must declare a rating goal during their rating process. Programs trying to achieve a Three- or Four-Star rating receive CLASS coaching and participate in a CLASS observation as part of their rating process. For programs with multiple classrooms, Parent Aware randomly selects one-third of all preschool classrooms for observation. Scores from the observation(s) are converted to indicator points at the Three- and Four-Star rating level. If an observation was collected for the purposes of the rating, the data were used for the evaluation. If the rating observation occurred in a three-year-old classroom, researchers asked these centers if they would participate in a CLASS observation in the four-year-old classroom. If a fully-rated center-based program's goal rating was a One- or Two-Star, researchers asked these programs if they would participate in a CLASS observation for the purpose of the evaluation only. All programs participating in an evaluation CLASS observation received a feedback report containing the average scores from their observation as well as strengths and recommendations for the staff.

In addition to the CLASS observation, all fully-rated centers, regardless of goal rating were asked to participate in an Early Childhood Environment Rating Scale – Revised (ECERS-R) observation. The classroom selected for the CLASS observation was selected for the ECERS-R observation. ERS and CLASS observations took place on different days and when possible

were observed by different observers. Researchers made efforts to collect a CLASS and an ECERS-R observation from each center, however in some instance it was not possible and only the CLASS observation was conducted.

Fully-rated family child care providers were eligible to participate in observations if they served children between the ages of three and five. Family child care providers serving only infants and toddlers were not eligible to participate in the observations. The Family Child Care Environment Rating Scale – Revised (FCCERS-R) was conducted in programs that agreed to participate.

In child care centers and family child care programs, researchers scheduled the observation(s) in advance with the cooperation and input from the center director/family child care provider. Observations were scheduled on a "normal" day. Researchers made effort to not schedule observations on days that were not typical for the program. The observations were always conducted during the morning hours, usually between 8am – 12pm.

In addition to the CLASS, ECERS-R, and FCCERS-R observations, observers administered select subscales from the Environment Rating Scale – Extension (ECERS-E) to assess teaching practices specific to math, literacy, and planning for children's individual needs. The ECERS-E observation is administered on the same day as the ECERS-R or FCCERS-R tool and was used in centers and family child care programs. After the ERS observation concluded at the end of the morning, the observer conducted a short (10-15 minute) interview with the lead teacher in order to clarify and answer questions.

Table 18. The number of fully-rated programs contacted by the research team during the 2012-2015 recruitment period.

	Fully-rated Family child care contacted	Fully-rated Family child care recruited	Fully-rated Family child care participating in evaluation observations	Fully-rated Child care center contacted	Fully-rated Child care center recruited	Fully-rated Child care center participating in evaluation observations
Year 1: 2012	60	8	3	22	6	5
Year 2: 2013	172	31	14	54	22	19
Year 3: 2014	252	46	18	53	27	13

	Fully-rated Family child care contacted	Fully-rated Family child care recruited	Fully-rated Family child care participating in evaluation observations	Fully-rated Child care center contacted	Fully-rated Child care center recruited	Fully-rated Child care center participating in evaluation observations
Year 4: 2015*	42	25	21	63	12	10
TOTAL	526	110	56	130	53	47

Source: Child Trends recruitment data 2012-2015

*In 2015, recruitment efforts took place during the summer of 2015 only.

Accredited Child Care Centers

Accredited child care centers that recently completed the NAEYC accreditation process through the Child Care Accreditation project (CAP) were invited to participate in the evaluation. In addition to recently accredited programs, the research team sampled accredited child care centers throughout the Twin Cities metropolitan area. Accredited programs were asked to participate in the CLASS, ECERS-R, and ECERS-E observations. Accredited child care centers received feedback reports from their observations which included scores, recommendations, and strengths. Only preschool classrooms were targeted for participation. In programs with more than one preschool classroom, the center director and researchers worked together to identify the classroom eligible to participate. Similar to fully-rated centers, the classroom serving the most four-year-old children was targeted for participation. If centers reported having more than one classroom with a majority of four-year-olds, researchers randomly selected one classroom to participate in the evaluation. In total, 171 accredited programs were contacted for participation in the evaluation. See Table 19 for a description of accredited programs contacted and recruited.[51]

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[51] Three accredited program were recruited into the evaluation but did not receive a Parent Aware rating. They were removed from further analysis

Table 19. Number of accredited programs contacted and recruited in the evaluation.

	Accredited family child care contacted	Accredited family child care recruited	Accredited family child care participating in evaluation observations	Accredited child care center contacted	Accredited child care center recruited	Accredited child care center participating in evaluation observations
Year 1: 2012	6	2	2	28	15	15
Year 2: 2013	0	0	0	57	25	23
Year 3: 2014	0	0	0	86	45	35
Year 4: 2015*	n/a	n/a	n/a	n/a	n/a	n/a
TOTAL	6	2	2	171	85	73

Source: Child Trends recruitment data 2012-2015

*In 2015, recruitment efforts took place during the summer of 2015 only.

School-Based Pre-Kindergarten Programs

School-based pre-kindergarten programs enter Parent Aware through the Accelerated Pathway to Rating (APR) process. The Minnesota Department of Education (MDE) has primary responsibility for recruiting and communicating with school-based pre-kindergarten programs in Parent Aware. They make the initial rating determination and recommend a rating level to the Minnesota Department of Human Services (DHS) who issues the final rating to public school programs. School-based pre-kindergarten programs have been eligible to join Parent Aware since its initial roll out in 2012. Most programs applied for a rating in 2013. School districts apply for one Parent Aware rating that is awarded to all buildings and classrooms within the district that serve Pre-K children.

Recruitment with school-based pre-kindergarten programs began in 2012 and continued during 2013 and 2014. Beginning in 2013, Child Trends collaborated closely with colleagues at MDE to bolster recruitment efforts. In 2013 and 2014, colleagues at MDE emailed coordinators at Parent Aware-rated school districts throughout the state to briefly describe the evaluation and to ask them to participate. Interested coordinators responded directly to MDE and the information was shared with Child Trends. Child Trends followed up with the school contacts to answer any remaining questions about the evaluation and to learn more detail about the scope of their pre-kindergarten program. In larger school districts, there may be several different schools offering a pre-kindergarten program that serve multiple sections of children throughout the week. In smaller districts, there may be only one school offering a pre-kindergarten program but that still offers more than one section

of programming. Child Trends discussed the research activities with the school district coordinators to determine the school(s) and classroom(s) and section(s) to target for the evaluation activities. Whenever possible, the section that served children for the most hours each week was selected to participate in the evaluation. In some cases, more than one school per district participated. Table 20 displays the breakdown of school-based pre-kindergarten programs participating in the Parent Aware Evaluation.

Table 20. Number of school-based pre-kindergarten sites in the Parent Aware Evaluation.

	School districts contacted	School districts recruited	School districts participating	Number of schools participating in evaluation observations
Year 1: 2012	2	2	2	2
Year 2: 2013	10	7	7	7
Year 3: 2014	44	24	24	26
Year 4: 2015*	n/a	n/a	n/a	n/a
TOTAL	56	33	33	35

Source: Child Trends recruitment data 2012-2015

Head Start Programs

Similar to school-based pre-kindergarten programs, Head Start programs enter Parent Aware through the Accelerated Pathway to Ratings (APR) process. MDE has primary responsibility for recruiting and communicating with Head Start programs about Parent Aware. The initial rating determination is recommended by MDE, but DHS issues the final rating after review. Head Start programs have been eligible to join Parent Aware since the statewide rollout in 2012. The majority of programs joined in 2012. Head Start grantees apply for a rating on behalf of all of the sites overseen by the grantee.

Recruitment with Head Start began in 2012 and continued in each year of the evaluation, with most sites participating during the third year of the evaluation. Table 21 displays the recruitment efforts and the number of sites participating in observations during the evaluation. In practice, one or two Head Start sites from a grantee participated in the evaluation (average 1.7 sites per grantee).

Table 21. Number of Head Start sites in the Parent Aware Evaluation.

	Head Start grantees contacted	Head Start grantees recruited	Head Start grantees participating	Number of Head Start sites participating in evaluation observations
Year 1: 2012	1	1	1	2
Year 2: 2013	1	0	0	0
Year 3: 2014	28	13	12	24
Year 4: 2015*	n/a	n/a	n/a	n/a
TOTAL	30	13	15	26

Source: Child Trends recruitment data 2012-2015

Child Sampling, Recruitment and Data Collection Procedures

Assessments took place in a variety of locations, but always at the early care and education program. Assessments may have occurred in the classroom or the hallway or an empty office or the kitchen table in the case of family child care. Assessors were trained to ask if the assessment could take place in a location as free of distractions as possible. When assessments took place in the classroom, assessors were trained to face the instruction/play areas thereby reducing distractions for the child completing the assessment.

During the first year of the statewide Parent Aware rollout, all programs going through the full-rating process were contacted and asked to participate in the Parent Aware Evaluation research activities, which included one or two on-site observations of the center-based/home-based environment and helping recruit families and children to participate in child assessments. During the second and third years of the evaluation, programs were only recruited to participate after they had received their rating. This decision was made in an effort to reduce burden on programs going through the full-rating process by not participating in research activities at the same time as completing their Quality Documentation Portfolio. This was also an effort to avoid enrolling programs into the research study that discontinued participating in Parent Aware before they earned a rating.

In a family child care setting, children were eligible to participate in the child assessments if the provider served children who were four-years-old. In child care centers, the center director and the research team determined which classroom would be selected to participate in the evaluation activities. The classroom that served the most four-year-old children in their year prior to kindergarten was prioritized. If there was more than one

classroom fitting this description, the research team and the center director used other criteria to select the classroom. Classrooms experiencing teacher turnover were excluded whenever possible. Classrooms serving high numbers of low-income were prioritized. Center directors were asked to distribute parent-child consent forms to each four-year-old child in the selected classroom. Up to six children per child care center classroom were eligible. Up to two children per family child care home were eligible. If more families returned consent forms, up to two additional children were enrolled to account for possible attrition in the sample from fall to spring. Researchers prioritized evaluation enrollment to families that received a child care subsidy to help pay for child care.

Researchers followed up with programs on a regular basis during the recruitment window to answer questions and to encourage them to return signed consent forms. Researchers offered to go to programs to talk about the evaluation during drop-off and pick-up hours if programs were having difficulty recruiting families and children. Children were recruited from all program types, including fully-rated family child care, fully-rated child care centers, accredited child care centers, Head Start programs, and school-based pre-kindergarten sites. Table 22 displays the number of programs researchers sent recruitment materials to and the number of programs that participated in the child assessment activity.

Table 22. Number of programs sent and returning consent forms in the evaluation.

2012-2013		2013-2014		2014-2015	
Number of programs sent consent forms	Number of programs returning consent forms	Number of programs sent consent forms	Number of programs returning consent forms	Number of programs sent consent forms	Number of programs returning consent forms
52	29	124	72	198	121

Source: Child Trends recruitment data 2012-2015

Early Learning Scholarship Recruitment

Children participating in the Early Learning Scholarship and Parent Aware Evaluations attended Parent Aware-rated programs throughout the state of Minnesota. Recruitment for the Early Learning Scholarship evaluation began in the summer of 2014. The research team worked closely with state scholarship administrators throughout Minnesota to identify children receiving the Early Learning Scholarship who met two eligibility criteria: 1) children were four-years-old and would be starting kindergarten in fall 2015, and 2) parents had consented to participate in the evaluation when completing the Pathway I or Pathway II application.

A randomly selected sample of 546 children throughout the state of Minnesota was chosen to participate in the evaluation of the Early Learning Scholarships. The random selection process included clustering children by several measures: Child Care Aware region throughout the state, early care and education program, and Early Learning Scholarship pathway type. The random selection process included assigning children to "priority" (n = 277) and "replacement" (n = 269) groups. If a child in the priority group was not able to participate in the evaluation, a different child was selected from the replacement group, who matched the prioritized child's region and pathway type (and program whenever possible). If there were no matched children available, the research team contacted the Early Learning Scholarship administrator to request a new sample of children from that region and pathway type. In total, Early Learning Scholarship administrators identified an additional 174 eligible children that were added to the replacement list.

There were several reasons why a child from the priority list was replaced, including but not limited to the following:

- Child no longer attends program
- Child no longer receives scholarship
- Child already attending kindergarten
- Child absent on the day of scheduled assessment
- Parent declined to participate
- Program declined to participate
- Program no longer in session
- Program not open during the full fall to spring assessment window

Researchers mailed a letter to the early care and education programs that served the children in the priority and replacement groups, informing them about the data collection activities and the purpose of the evaluation. Researchers also mailed a letter to all families whose children were randomly selected to participate. The letter informed families that their child was randomly selected to participate in the evaluation of the Early Learning Scholarships, but that the family could opt out at any time. Ten families called to opt out of the evaluation.

Table 23 displays the breakdown of originally sampled children by region and pathway type alongside the final sample breakdown. Targets were met in all regions except Regions 5 and 6w. Of the original 277 randomly selected children to participate in the evaluation, 131 participated in the direct assessment (n = 47%).

Table 23. Number of children sampled by region and pathway type, original and final sample.

Region	Original Sample			Final Sample		
	Programs	Pathway 1	Pathway 2	Programs	Pathway 1	Pathway 2
1	3	4	2	4	4	2
2	2	1	2	3	1	2
3	5	6	4	6	6	4
4	7	7	8	9	7	8
5	5	4	5	5	3	6
6e	3	5	0	6	5	0
6w	2	2	0	0	0	0
7e	6	5	9	6	5	9
7w	2	5	0	2	5	0
8	5	6	5	5	6	5
9	11	7	17	11	7	17
10	12	12	22	15	14	24
11	49	49	90	56	50	92
Total	112	113	164	128	113	169
		277			**282**	

Source: Child Trends recruitment data 2012-2015

Race-to-the-Top Early Learning Challenge Scholarship Recruitment

Recruitment for children receiving the RTT-ELC Scholarship began in the summer of 2014 by identifying the scholarship recipients in each Transformation Zone whose dates of birth were between February 2009 and September 2010. These children fit the eligibility criteria of being four-years-old in their final year of preschool/their year before kindergarten.

Administrative data from the Transformation Zones identified 197 children from forty-six Parent Aware-rated programs that were age-eligible to participate in the child assessment activities of the evaluation. No additional eligibility criteria were employed. In some cases, only one child per program participated and as many as twelve children from another program participated.

Letters were mailed to all programs that served eligible children notifying them of the RTT-ELC Scholarship evaluation activities. Child Trends followed up with programs by email and by telephone to discuss the research activities with the programs and to answer their questions. During these phone calls, programs informed the research team when there were enrollment updates, such as a child no longer attending the program (because of a move or because the child was in or entering kindergarten) or a child no longer received the Scholarship. Program staff was asked to distribute the consent forms to the remaining families. All families were asked to actively select *yes* or *no* to consent to participate in the

evaluation. Research staff and Transformation Zone staff followed up with programs and families throughout the fall of 2014 in order to ensure as high a response rate as possible. Research staff worked with each Transformation Zone in order to best tailor the recruitment methods to each community. The consent form response rate was 89%. See Table 24 for a complete distribution of the number of consent forms received and the number of children who participated in the data collection activities.

Table 24. Number of children participating in RTT-ELC scholarship recruitment

Number of children eligible for assessment	Number of consent forms received, marked "YES"	Number of consent forms received, marked "NO"	Number of consent forms not received
128	100	14	14

Source: Child Trends recruitment data 2012-2015

Child Data Not Included in the Final Dataset

Some of the child assessment data collected for the Parent Aware Evaluation was not included in the final dataset. During the data cleaning process, data from nine children were removed because the children were too young; data from 19 children were removed because the program did not have a Parent Aware rating to associate with the program; and one child's data were removed because the research team could not ascertain the child's date of birth. Additionally, there were 27 children whose consent forms were collected, but who never participated in any child assessment data collection activities. The most frequent reason was that the child was no longer at the program by the time assessors conducted child assessments in the fall.

Appendix C: Data Sources

Data	Description of Data/Measure	Data Source (organization responsible for collecting it)
Individual Growth and Development Indicators (IGDI) – Picture Naming	The IGDI is an assessment of expressive language and is measured by the number of pictures a child can name in a minute.	Early Childhood Research Institute on Measuring Growth and Development. (1998, April). *Research and development of individual growth and development indicators for children between birth to age eight* (Technical report 4). Minneapolis, MN: Center for Early Education and Development. The assessment is administered by Child Trends' assessment team.
***pre*LAS Language Proficiency Assessment™**	The *pre*LAS is a screener for English language proficiency. Two sub-tests are administered: Simon Says (assesses receptive language by asking children to execute simple commands) and Art Show (assesses expressive language by asking children to identify objects and describe a purpose of the object)	Duncan, S. E., & Avila, E. A. (1998). *pre*LAS. Monterey, CA: CBT McGraw Hill. The assessment is administered by Child Trends' assessment team.
Test of Preschool Early Literacy (TOPEL)	TOPEL is an assessment of early literacy skills. Two sub-tests are administered: Print Knowledge (in which children identify letters and words) and Phonological Awareness (in which children perform word elision and blending).	Lonigan, C. J., Wagner, R. K., Torgeson, J. K., & Rashotte, C.A. (2007). *Test of Preschool Early Literacy (TOPEL)*. Austin, TX: PRO-ED, Inc. The assessment is administered by Child Trends' assessment team.
Woodcock-Johnson Tests of Achievement (WJ-III) • **Applied Problems**	The WJ-III Applied Problems test assesses early numeracy and math skills including counting, addition and subtraction.	Woodcock, R. W., McGrew, K. S., & Mather, N. (2001). *Woodcock-Johnson Tests of Achievement* (Third Edition). Rolling Meadows, IL: Riverside Publishing.

Data	Description of Data/Measure	Data Source (organization responsible for collecting it)
		The assessment is administered by Child Trends' assessment team.
Social Competence and Behavior Evaluation (SCBE-30) • **Social-Competency** • **Anxiety/Withdrawal** • **Anger/Aggression**	The SCBE-30 is a teacher report of Social Competence (pro-social behaviors), Anger-Aggression (oppositional behaviors) and Anxiety-Withdrawal (anxiety and depression).	LaFreniere, P. J., & Dumas, J. E. (1996). *Social competence and behavior evaluation in children ages 3 to 6 year: the short form* (SCBE-30). *Psychological Assessment, 8*(4), 369-377. The assessment is conducted by teachers/family child care providers and collected by Child Trends.
Preschool Learning and Behavior Scale (PLBS) • **Attention/Persistence**	The PLBS Persistence scale is a teacher report of children's attention and approaches to learning.	McDermott, P. A., Leigh, N. M., & Perry, M. A. (2002). Development and validation of the Preschool Learning Behaviors Scale. *Psychology in the Schools*, *39*, 353–365. The assessment is conducted by teachers/family child care providers and collected by Child Trends.
Peg tapping	Peg tapping assesses executive function including working memory and inhibitory control. Children are instructed to tap once when examiner taps twice and tap twice when examiner taps once.	Luria, A. R. (1966). *The higher cortical functions in man.* New York, NY: Basic Books. Diamond, A., & Taylor, C. (1996). Development of an aspect of executive control: Development of the abilities to remember what I said and to "Do as I say, not as I do." *Developmental Psychobiology, 29,* 315–334. The assessment is administered by Child Trends' assessment team.
Bracken School Readiness	BSRA tests children's knowledge of basic	Bracken, Bruce A. (2007). Bracken School

Data	Description of Data/Measure	Data Source (organization responsible for collecting it)
Assessment (BRSA) Third Edition	school readiness concepts such as colors, letters, numbers/counting, sizes/comparisons, and shapes.	Readiness Assessment (Third Edition). Pearson Inc. The assessment is administered by Child Trends' assessment team.
Height and Weight Measurement	Height and weight is used to calculate body mass index (BMI) a screener for weight categories that may put a child at risk for health problems.	The assessment is administered by Child Trends' assessment team.
Classroom Assessment Scoring System (CLASS) – Pre-K	The CLASS Pre-K is a classroom observation tool that assesses three domains of teacher-child interactions: Instructional Support, Classroom Organization and Emotional Support. Four CLASS cycles are collected.	Pianta, R.C., La Paro, K.M., & Hamre, B.K. (2006). Classroom Assessment Scoring System. Center for Advanced Study of Teaching and Learning. Charlottesville, VA. The observation is conducted by trained and reliable observers from the Assessment and Training Center in the Center for Early Education and Development at the University of Minnesota and Child Trends.
Early Childhood Environment Rating Scale – Revised (ECERS-R)	The ECERS-R is a classroom observation tool that assesses the quality of the environment, materials, activities and health and safety provisions for children age 2.5- through 5-years old. The 3-hour data collection period includes a staff interview.	Harms, T., Clifford, R.M., & Cryer, D. (2005). Early Childhood Environment Rating Scale, Revised Edition. New York: Teachers College Press. The observation is conducted by trained and reliable observers from the Assessment and Training Center in the Center for Early Education and Development at the University of Minnesota.
Family Child Care Environment Rating Scale – Revised (FCCERS-R)	The FCCERS-R is an observation tool conducted in family child care programs serving children from infancy through	Harms, T., Cryer, D., & Clifford, R.M. (2007). Family Child Care Environment Rating Scale, Revised Edition. New York: Teachers

Data	Description of Data/Measure	Data Source (organization responsible for collecting it)
	school-age. It assesses the quality of the environment, materials, activities and health and safety provisions. The 3-hour data collection period includes a staff interview.	College Press. The observation is conducted by trained and reliable observers from the Assessment and Training Center in the Center for Early Education and Development at the University of Minnesota and Child Trends.
Early Childhood Environment Rating Scale – Extended (ECERS-E)	The ECERS-E is an observation tool completed with the ECERS-R and the FCCERS-R. Two sub-scales (Literacy and Mathematics) and one item (Planning for Children's Individualized Learning) are scored. A staff interview is included.	Sylva, K., Siraj-Blatchford, I., Taggart, B. (2010). ECERS-E: The Four Curricular Subscales to the Early Childhood Environment Rating Scale (ECERS-R) (4th ed). New York: Teachers College Press. The observation is conducted by trained and reliable observers from the Assessment and Training Center in the Center for Early Education and Development at the University of Minnesota and Child Trends.
Parent Aware enrollment data, indicators, and ratings	Enrollment data, scores on the Parent Aware indicators and rating are documented at each rating cycle. These data are linked to scores on observational assessments and children's development,	Develop, Minnesota's Quality Improvement and Registry Tool is a data system administered by Minnesota Department of Human Services. Develop data are shared with Child Trends at regular intervals.
Demographic data about children and families enrolled in the evaluation	Parents completed an enrollment form when signing consent forms for the evaluation. In addition, parents completed a telephone interview and provided additional information about the child and the family's experiences with early care and education settings.	The enrollment form is collected by Child Trends. The parent interview is conducted by Wilder Research, and data are shared with Child Trends.

Appendix D: Details about Data and Analytic Methods

Details about Imputation of Dosage

Data were imputed based on the following variables:

- Child age
- Child gender
- Child race / ethnicity
- Child attendance
- Family low-income status
- Parental education
- Subsidy type
- Program type

These variables were included because they could function as proxies of parental employment status and program opening hours and hence could have high predictive power for dosage (Schafer, 2003). To account for the possible uncertainties in predicted dosage information, the imputation was conducted for 40 times and generated 40 imputed datasets. Figure 20 and Figure 21 show distributions of dosage in observed cases and in fully imputed datasets. HLM models were conducted for 40 times on each of the 40 imputed datasets. These results were then combined using Rubin's combination rule (Rubin, 1987).

Figure 20. Enrolled hours before imputation
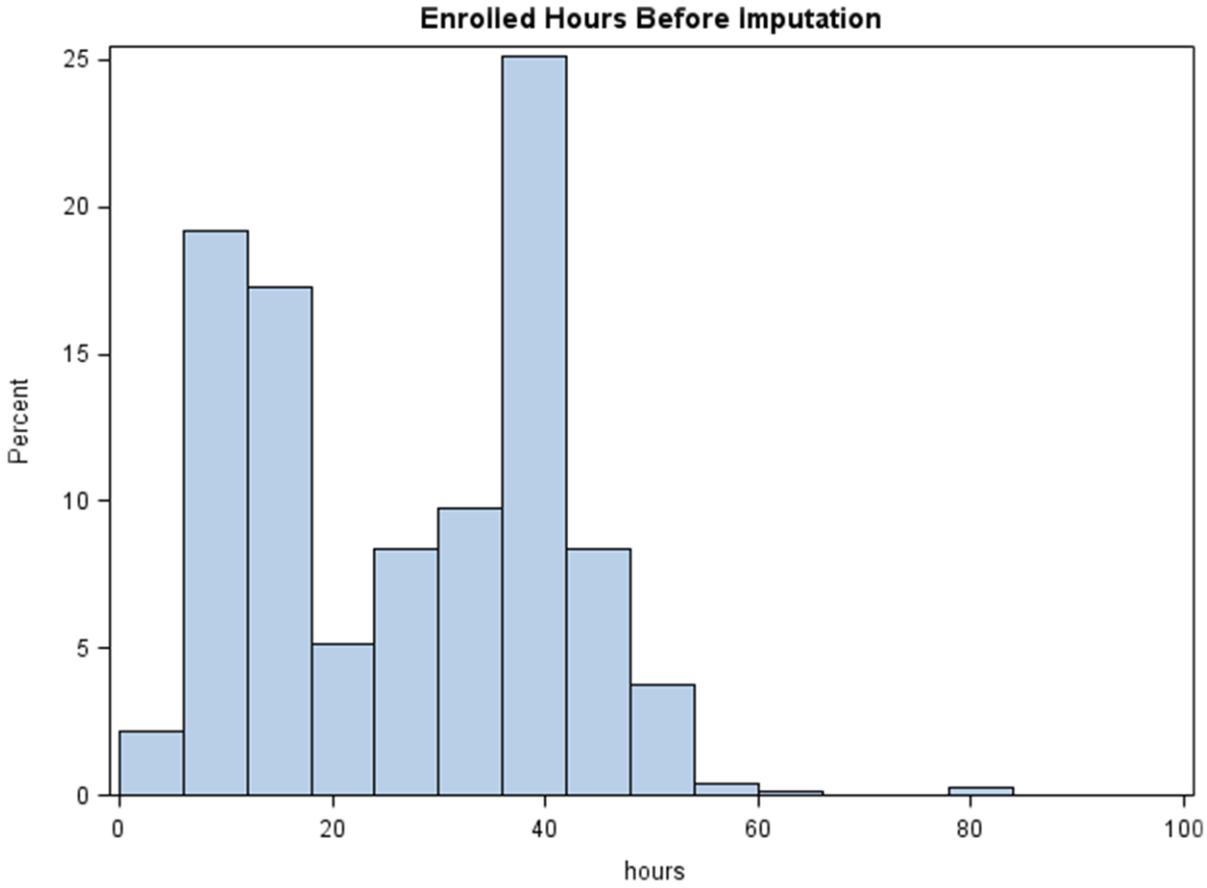
Figure 21. Enrolled hours after imputation

Enrolled Hours After Imputation
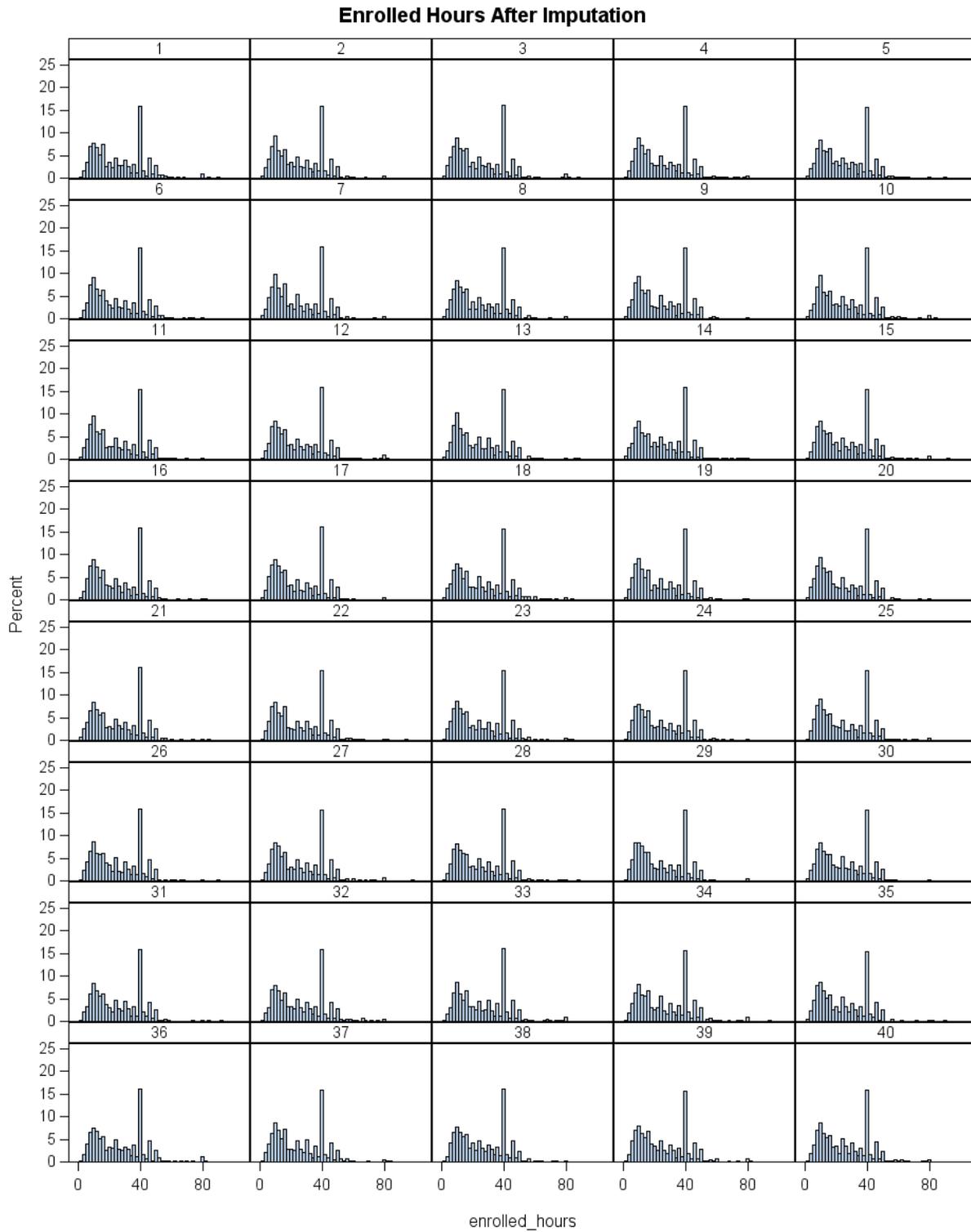
Details about Propensity Score Matching

Children were matched on the following variables:

- Child gender
- Child race / ethnicity
- Child English language levels
- Family low-income status
- Child attendance
- Parental education
- Fall assessment scores

There were 126 matched pairs of children in Three- and Four-Star rated programs compared to children in APR programs.

Appendix E: Summary of HLM Analyses

Table 25. Summary of HLM analyses examining whether children's development varies by Parent Aware rating and low-income status

Variable	WJ B	WJ SE	IGDI B	IGDI SE	TOPEL PA B	TOPEL PA SE	TOPEL PK B	TOPEL PK SE	PEG TAP B	PEG TAP SE	SCBE SC B	SCBE SC SE	PLBS B	PLBS SE	SCBE Anx B	SCBE Anx SE	SCBE Agg B	SCBE Agg SE
Low-Income with Higher Rating	1.31	1.82	0.70	1.24	4.66	3.05	**3.60**$^+$	2.13	0.24	0.79	**3.05**$^+$	1.72	-1.44	1.85	-0.88	1.25	0.22	1.40
Higher Rating	-0.66	1.04	-0.02	0.81	0.10	1.85	-1.22	1.28	-0.02	0.46	1.73	1.18	**2.62***	1.16	-0.33	0.83	-0.54	0.88
Low-Income	-0.52	1.74	-0.95	1.17	-2.63	2.89	-0.67	2.03	-0.17	0.76	-2.18	1.61	1.01	1.75	0.76	1.18	0.00	1.32
Enrolled Hours	-0.01	0.02	0.01	0.02	0.06	0.04	-0.03	0.03	0.00	0.01	-0.02	0.03	-0.01	0.03	0.02	0.02	0.00	0.02
Age at Spring	**-2.13*****	0.60	-0.02	0.40	**-3.02****	1.01	-0.55	0.71	**-0.78****	0.27	-0.37	0.56	0.72	0.62	-0.03	0.41	-0.44	0.46
Male	0.19	0.58	0.45	0.38	0.54	0.96	0.37	0.68	**0.46**$^+$	0.26	0.18	0.53	0.81	0.59	-0.04	0.39	-0.01	0.44
Ethnicity - Nonwhite	-0.49	1.02	**1.27**$^+$	0.70	-0.95	1.72	-0.68	1.21	**0.77**$^+$	0.46	-0.67	0.99	0.48	1.08	0.32	0.73	-0.18	0.81
English: Good	-0.03	0.84	0.31	0.56	0.38	1.39	**-1.66**$^+$	0.99	0.20	0.37	0.17	0.76	-0.38	0.85	**-1.21***	0.56	-0.66	0.64
English: Fair	1.48	1.96	-0.51	1.22	3.40	3.35	**-5.59***	2.31	**1.88***	0.89	-0.19	1.62	-0.15	1.85	0.15	1.19	-0.51	1.36
Fall Attendance	1.37	1.06	-0.43	0.71	0.36	1.77	**2.71***	1.26	**0.86**$^+$	0.48	0.00	0.97	-0.32	1.08	0.54	0.71	-0.82	0.81
Spring Attendance	**-1.68***	0.86	-0.13	0.59	1.91	1.46	-1.32	1.03	0.40	0.38	-1.09	0.83	-0.58	0.90	-0.81	0.61	**1.34***	0.68
Parent Ed. High School	0.90	0.91	0.75	0.61	-0.02	1.52	0.93	1.07	0.26	0.40	0.46	0.84	0.76	0.93	**1.36***	0.61	0.30	0.69
Parent Ed. College	0.50	0.88	0.18	0.59	0.53	1.45	**1.73**$^+$	1.03	**0.77***	0.39	0.14	0.81	0.72	0.90	0.30	0.59	0.52	0.67

Table 26. Summary of HLM analyses examining association between ECERS-R and child development.

Variable	WJ B	WJ SE	IGDI B	IGDI SE	TOPEL PA B	TOPEL PA SE	TOPEL PK B	TOPEL PK SE	PEG TAP B	PEG TAP SE	SCBE SC B	SCBE SC SE	PLBS B	PLBS SE	SCBE Anx B	SCBE Anx SE	SCBE Agg B	SCBE Agg SE
ECERS-R	0.14	0.75	**1.03**[+]	0.61	1.60	1.33	**2.0**[+]	1.04	0.41	0.32	1.48	1.07	-0.06	0.89	0.13	0.64	0.13	0.68
Enrolled Hours	0.00	0.03	0.02	0.02	0.05	0.05	-0.05	0.04	0.00	0.01	-0.03	0.03	-0.03	0.03	0.03	0.02	0.00	0.03
Age at Spring	**-2.74****	0.85	0.01	0.59	**-3.37***	1.37	-1.53	1.08	-0.55	0.36	-0.22	0.81	0.94	0.92	0.22	0.58	**-1.48***	0.68
Male	0.31	0.82	0.60	0.56	0.33	1.31	0.82	1.04	0.40	0.35	0.11	0.77	0.75	0.88	-0.07	0.55	0.46	0.65
Ethnicity - Nonwhite	-0.63	1.24	**1.65**[+]	0.88	-0.85	2.05	0.86	1.61	**1.05**[+]	0.55	-0.56	1.24	0.65	1.37	0.52	0.87	-0.16	1.02
English: Good	0.27	1.06	0.20	0.73	0.95	1.70	-1.70	1.35	0.13	0.45	0.67	0.98	-0.50	1.13	**-1.22**[+]	0.70	-0.92	0.84
English: Fair	1.40	2.16	1.01	1.43	4.83	3.49	**-5.82***	2.72	**1.69**[+]	0.94	0.49	1.87	-0.51	2.21	-0.32	1.33	-1.03	1.60
Low Income	0.08	1.12	-1.25	0.78	-0.47	1.80	0.86	1.43	0.06	0.48	-0.31	1.07	0.25	1.17	-0.34	0.75	-0.14	0.88
Fall Attendance	**2.55**[+]	1.38	-0.66	0.95	1.07	2.20	**4.53****	1.75	0.85	0.59	-0.80	1.32	-0.07	1.52	0.69	0.93	-1.22	1.11
Spring Attendance	-0.72	1.25	0.34	0.88	0.58	2.01	1.42	1.60	0.60	0.53	-1.40	1.25	-1.59	1.35	**-2.15***	0.87	0.90	1.01
Parent Ed. High School	**2.76**[+]	1.47	1.62	1.00	0.30	2.34	**4.27***	1.87	0.71	0.62	0.25	1.39	-0.44	1.57	**1.93**[+]	0.99	0.20	1.17
Parent Ed. College	0.87	1.31	**1.52**[+]	0.90	1.01	2.10	2.53	1.66	0.17	0.56	0.59	1.25	0.99	1.41	0.11	0.88	0.55	1.04

Table 27. Summary of HLM analyses examining association between ECERS-E and child development.

Variable	WJ B	WJ SE	IGDI B	IGDI SE	TOPEL PA B	TOPEL PA SE	TOPEL PK B	TOPEL PK SE	PEG TAP B	PEG TAP SE	SCBE SC B	SCBE SC SE	PLBS B	PLBS SE	SCBE Anx B	SCBE Anx SE	SCBE Agg B	SCBE Agg SE
ECERS-E: DPL	-0.32	0.39	0.16	0.31	0.71	0.69	-0.16	0.54	0.15	0.17	**-0.93**[+]	0.55	-0.59	0.45	0.07	0.34	0.10	0.36
ECERS-E: Language	0.87	0.59	**0.96***	0.46	-0.29	1.05	1.17	0.81	0.07	0.25	**1.58**[+]	0.81	0.89	0.68	-0.65	0.50	-0.20	0.53
ECERS-E: Math	-0.01	0.44	-0.01	0.36	0.11	0.79	0.01	0.62	-0.24	0.19	-0.06	0.63	-0.11	0.52	-0.04	0.38	0.48	0.40
Enrolled Hours	0.02	0.03	0.01	0.02	0.04	0.05	-0.05	0.04	0.00	0.01	-0.01	0.03	0.00	0.03	0.02	0.02	0.00	0.02
Age at Spring	**-2.32***	0.82	-0.05	0.55	**-3.29***	1.32	-1.41	1.03	**-0.73***	0.35	-0.24	0.77	1.07	0.86	0.12	0.55	**-1.29***	0.64
Male	-0.01	0.79	0.46	0.53	0.51	1.27	0.43	0.98	0.33	0.34	0.30	0.72	0.92	0.82	-0.15	0.52	0.21	0.61
Ethnicity - Nonwhite	-0.64	1.24	**1.54**[+]	0.84	-1.40	2.02	0.24	1.56	**1.02**[+]	0.53	-0.74	1.19	-0.42	1.29	0.32	0.84	-0.22	0.97
English: Good	0.61	1.01	0.38	0.67	0.88	1.61	-1.47	1.25	0.23	0.43	0.73	0.92	-0.30	1.05	**-1.58***	0.66	-0.94	0.78
English: Fair	1.84	2.17	0.54	1.35	5.17	3.53	**-4.83**[+]	2.70	**1.57**[+]	0.95	1.04	1.74	-0.08	2.05	-0.64	1.26	-1.32	1.49
Low Income	-0.02	1.10	-1.08	0.74	0.08	1.76	0.44	1.37	0.06	0.47	-0.11	1.02	0.69	1.11	-0.11	0.72	0.05	0.83
Fall Attendance	2.15	1.34	-0.63	0.90	1.78	2.13	**4.19***	1.67	0.92	0.57	-0.29	1.22	-0.07	1.41	1.03	0.88	-1.38	1.03
Spring Attendance	-1.02	1.23	-0.09	0.84	1.27	1.98	1.21	1.55	0.75	0.52	-1.51	1.19	-1.67	1.28	**-2.16***	0.84	0.90	0.96
Parent Ed. High School	2.47	1.44	1.36	0.95	-0.58	2.30	**3.36**[+]	1.80	0.55	0.61	0.48	1.32	-0.11	1.49	**1.72**[+]	0.95	0.02	1.11
Parent Ed. College	0.96	1.23	0.78	0.83	0.88	1.98	2.16	1.54	0.43	0.52	0.15	1.15	0.62	1.28	-0.04	0.82	0.17	0.95

Table 28. Summary of HLM analyses examining association between CLASS and child development.

Variable	WJ B	WJ SE	IGDI B	IGDI SE	TOPEL PA B	TOPEL PA SE	TOPEL PK B	TOPEL PK SE	PEG TAP B	PEG TAP SE	SCBE SC B	SCBE SC SE	PLBS B	PLBS SE	SCBE Anx B	SCBE Anx SE	SCBE Agg B	SCBE Agg SE
CLASS: CO	-0.24	0.91	-0.20	0.78	0.94	1.64	1.49	1.29	-0.13	0.39	1.96	1.25	-0.44	1.05	**1.71***	0.81	1.13	0.85
CLASS: ES	-0.06	0.93	-0.37	0.82	-1.81	1.68	-0.69	1.33	-0.07	0.40	-1.47	1.33	-0.46	1.09	-0.19	0.85	-0.34	0.89
CLASS: IS	0.15	0.70	0.16	0.64	0.39	1.29	0.19	1.02	**0.98****	0.30	-0.22	1.01	-0.14	0.83	-0.59	0.65	-0.58	0.68
Enrolled Hours	-0.02	0.03	0.02	0.02	0.02	0.05	-0.03	0.04	0.01	0.01	-0.04	0.03	-0.05	0.03	**0.05***	0.02	0.02	0.02
Age at Spring	**-3.08*****	0.76	-0.02	0.52	**-2.51***	1.21	-1.53	0.97	**-0.98****	0.33	-0.30	0.71	1.11	0.81	0.34	0.54	-0.98	0.61
Male	0.66	0.73	0.36	0.49	0.44	1.15	0.76	0.93	0.25	0.31	0.29	0.67	0.53	0.77	-0.24	0.52	0.12	0.58
Ethnicity - Nonwhite	-0.81	1.14	1.18	0.80	-1.05	1.84	0.90	1.47	**0.91+**	0.49	-0.66	1.14	0.58	1.25	0.55	0.86	-0.14	0.96
English: Good	0.49	0.97	0.08	0.65	1.49	1.53	**-2.26+**	1.22	0.19	0.41	0.08	0.87	-0.47	1.00	**-1.26+**	0.67	-0.80	0.76
English: Fair	-0.06	2.15	0.43	1.41	4.10	3.46	**-6.22***	2.73	1.26	0.95	0.24	1.82	0.26	2.16	-0.18	1.40	-0.54	1.59
Low Income	0.28	0.98	-0.63	0.68	1.00	1.55	1.24	1.26	-0.03	0.42	0.25	0.91	0.39	1.01	-0.55	0.69	-0.26	0.77
Fall Attendance	**2.92***	1.28	-0.67	0.86	1.65	2.00	**4.83****	1.63	**1.11***	0.55	0.47	1.19	-0.18	1.38	0.56	0.91	-1.56	1.03
Spring Attendance	-1.75	1.15	0.47	0.81	0.47	1.84	-0.66	1.49	**1.06***	0.49	-1.11	1.17	-0.22	1.29	**-2.21***	0.88	0.84	0.98
Parent Ed. High School	**2.94***	1.28	1.01	0.86	1.14	2.02	2.21	1.63	0.63	0.55	0.16	1.18	0.10	1.35	**1.60+**	0.91	-0.21	1.02
Parent Ed. College	0.96	1.15	**1.36+**	0.77	-0.22	1.81	1.68	1.46	**1.03***	0.49	0.42	1.06	0.32	1.21	0.35	0.81	0.80	0.91

Table 29. Summary of HLM analyses examining association between FCCERS and child development.

	WJ		IGDI		TOPEL PA		TOPEL PK		PEG TAP		SCBE SC		PLBS		SCBE Anx		SCBE Agg	
Variable	B	SE	B	SE	B	SE	B	SE	B	SE	B	SE	B	SE	B	SE	B	SE
FCCERS	-5.40	3.49	1.09	2.20	-3.91	7.07	4.21	3.81	1.16	1.66	1.94	2.98	0.73	3.21	-0.54	2.20	0.41	2.02
Enrolled Hours	0.09	0.13	**-0.15[+]**	0.08	0.18	0.27	-0.08	0.14	-0.08	0.06	0.09	0.15	**0.29[+]**	0.16	0.12	0.09	0.05	0.10
Age at Spring	4.29	3.84	-1.20	2.14	-0.66	7.50	-3.59	4.17	-1.48	1.64	1.89	3.67	2.65	3.70	-0.41	2.14	0.31	2.38
Male	-0.27	2.91	0.41	1.80	4.42	5.55	-2.19	3.16	-0.11	1.39	-2.35	3.16	0.09	3.52	**-3.34[+]**	1.88	-1.06	2.10
Ethnicity - Nonwhite	-0.04	8.11	0.39	4.31	-12.36	16.00	-4.72	8.82	1.75	3.82	10.19	9.94	6.77	10.56	7.89	6.25	-6.50	6.64
English: Good	-5.42	3.58	0.52	2.24	3.18	6.94	2.56	3.89	0.79	1.68	2.61	3.52	3.29	3.77	-2.46	2.14	1.63	2.37
Low Income	8.14	5.31	-0.35	3.26	15.46	10.19	-1.15	5.78	0.21	2.54	7.51	4.98	5.51	5.31	5.43	3.36	-0.14	3.39
Fall Attendance	-0.53	5.60	0.30	3.58	7.25	10.82	-0.35	6.07	0.23	2.68	2.39	4.87	1.22	5.26	1.42	2.85	-2.17	3.30
Spring Attendance	**-12.90***	6.25	0.46	3.58	-5.27	12.00	2.94	6.80	2.75	2.72	6.35	6.06	**12.54***	6.29	1.39	3.82	0.72	4.04
Parent Ed. High School	-14.21	11.29	1.28	5.67	-17.35	21.81	-9.04	12.19	2.92	4.26	6.23	9.93	-7.23	10.38	-3.76	5.50	5.75	6.63
Parent Ed. College	-3.06	5.33	-3.91	3.11	-5.75	10.47	0.11	5.78	3.66	2.33	0.60	5.02	-4.70	5.17	-3.16	3.03	-0.24	3.30

Table 30. Summary of HLM analyses examining association between ECERS-R and child development for low-income sample.

	WJ		IGDI		TOPEL PA		TOPEL PK		PEG TAP		SCBE SC		PLBS		SCBE Anx		SCBE Agg	
Variable	B	SE	B	SE	B	SE	B	SE	B	SE	B	SE	B	SE	B	SE	B	SE
ECERS-R	0.78	1.32	0.55	0.90	**6.80****	2.36	**3.17$^+$**	1.76	0.59	0.60	2.07	1.80	0.65	1.46	-0.83	1.16	-1.42	1.18
Enrolled Hours	-0.02	0.05	0.03	0.04	0.05	0.10	-0.01	0.07	-0.01	0.03	-0.06	0.07	0.00	0.05	0.02	0.04	-0.05	0.05
Age at Spring	**-3.41***	1.43	0.29	0.90	**-4.94***	2.31	-2.36	1.65	-0.54	0.67	-0.18	1.47	1.96	1.47	0.28	1.12	**-2.41***	1.22
Male	-0.65	1.39	**1.75***	0.88	-1.43	2.25	0.52	1.61	0.82	0.65	-0.10	1.43	0.66	1.43	1.01	1.08	0.54	1.19
Ethnicity - Nonwhite	0.41	1.79	**2.37***	1.14	-0.55	2.92	2.33	2.11	1.03	0.85	-0.23	1.97	-0.15	1.87	-0.11	1.44	-0.53	1.56
English: Good	-0.48	1.99	0.74	1.24	0.38	3.15	-1.79	2.24	0.72	0.93	0.43	1.96	-0.62	2.00	**-2.95***	1.51	-1.76	1.68
English: Fair	2.97	2.75	**3.18$^+$**	1.68	3.75	4.46	**-5.62$^+$**	3.16	1.97	1.32	0.83	2.56	1.36	2.67	-0.07	1.95	-2.03	2.16
Fall Attendance	**3.52$^+$**	1.87	-0.31	1.19	-1.47	2.97	**4.58***	2.16	0.82	0.88	-0.68	1.92	-0.95	1.94	-0.39	1.45	**-3.56***	1.60
Spring Attendance	-1.52	2.02	0.56	1.27	-0.23	3.22	0.35	2.35	0.06	0.93	-0.01	2.11	1.30	2.06	**-3.93****	1.59	0.69	1.70
Parent Ed. High School	3.19	2.05	0.41	1.29	0.69	3.28	3.48	2.39	0.75	0.96	0.43	2.11	1.11	2.08	2.18	1.60	0.40	1.75
Parent Ed. College	0.56	2.03	0.42	1.28	-0.35	3.28	1.44	2.38	-0.16	0.94	0.33	2.05	2.82	2.04	0.60	1.54	1.35	1.69

Table 31. Summary of HLM analyses examining association between ECERS-E and child development for low-income sample.

Variable	WJ B	WJ SE	IGDI B	IGDI SE	TOPEL PA B	TOPEL PA SE	TOPEL PK B	TOPEL PK SE	PEG TAP B	PEG TAP SE	SCBE SC B	SCBE SC SE	PLBS B	PLBS SE	SCBE Anx B	SCBE Anx SE	SCBE Agg B	SCBE Agg SE
ECERS-E: DPL	-0.27	0.61	0.42	0.44	1.65	1.24	**-1.44$^+$**	0.87	0.25	0.30	-0.58	0.91	-0.66	0.64	0.25	.054	0.19	.054
ECERS-E: Language	1.50	1.09	0.94	.075	1.83	2.12	1.59	1.50	0.32	0.51	0.54	1.47	-0.14	1.12	-0.68	0.90	-0.26	0.93
ECERS-E: Math	0.02	0.72	-0.04	0.51	1.06	1.42	0.50	1.00	-0.49	0.35	0.69	1.01	0.34	0.75	-0.41	0.62	0.17	0.64
Enrolled Hours	0.01	0.05	0.03	0.04	0.06	0.10	-0.02	0.07	-0.01	0.03	-0.05	0.07	0.01	0.06	0.00	0.04	-0.05	0.05
Age at Spring	**-3.25***	1.40	0.09	0.87	**-5.81****	2.28	**-2.75$^+$**	1.62	-0.53	0.65	-0.20	1.45	1.82	1.42	0.36	1.09	**-2.21$^+$**	1.21
Male	-0.34	1.37	**2.19****	0.87	-0.57	2.25	0.54	1.58	1.03	0.65	0.18	1.41	0.38	1.39	1.14	1.05	0.48	1.17
Ethnicity - Nonwhite	0.23	1.76	1.89	1.13	-2.13	2.94	1.52	2.08	0.58	0.84	-0.61	1.98	-0.39	1.81	-0.19	1.40	-0.47	1.54
English: Good	0.01	1.92	0.82	1.22	1.19	3.08	-2.31	2.18	1.14	0.91	0.77	1.95	-0.19	1.94	**-2.76$^+$**	1.48	-1.60	1.67
English: Fair	3.18	2.76	2.48	1.66	3.85	4.56	-4.51	3.18	1.74	1.35	1.19	2.51	1.95	2.56	-0.70	1.88	-2.53	2.11
Fall Attendance	**3.29$^+$**	1.87	-0.55	1.19	-1.25	3.00	**4.43***	2.16	0.88	0.88	-0.43	1.93	-0.38	1.93	-0.42	1.44	**-3.75***	1.61
Spring Attendance	-1.50	2.05	0.06	1.29	-0.75	3.35	-0.54	2.39	0.14	0.95	-0.19	2.17	0.31	2.05	**-3.70***	1.59	0.96	1.72
Parent Ed. High School	3.01	2.01	0.17	1.29	-0.73	3.29	2.60	2.36	0.57	0.95	0.40	2.13	1.02	2.07	2.29	1.59	0.48	1.76
Parent Ed. College	0.26	2.02	-0.15	1.28	-0.74	3.32	0.48	2.36	0.01	0.95	0.27	2.07	2.61	2.03	0.95	1.54	1.56	1.71

Table 32. Summary of HLM analyses examining association between CLASS and child development for low-income sample.

Variable	WJ B	SE	IGDI B	SE	TOPEL PA B	SE	TOPEL PK B	SE	PEG TAP B	SE	SCBE SC B	SE	PLBS B	SE	SCBE Anx B	SE	SCBE Agg B	SE
CLASS: CO	1.56	1.38	0.18	1.06	1.53	2.66	2.45	1.84	-0.08	0.67	2.90	1.83	0.95	1.61	1.49	1.32	0.79	1.39
CLASS: ES	-0.86	1.58	-1.05	1.21	-3.62	3.04	-0.45	2.10	0.27	0.77	-1.49	1.32	-0.20	1.84	1.44	1.50	0.13	1.59
CLASS: IS	-1.55	1.14	0.24	0.87	1.89	2.15	-0.95	1.51	**1.00$^+$**	0.55	-0.09	1.47	-0.35	1.28	**-2.06$^+$**	1.05	-1.24	1.12
Enrolled Hours	-0.05	0.04	0.01	0.03	0.00	0.08	-0.01	0.06	0.00	0.02	-0.06	0.05	-0.03	0.05	0.04	0.04	-0.01	0.04
Age at Spring	**-2.65***	1.13	0.51	0.74	**-4.06***	1.91	-2.34	1.36	**-0.99$^+$**	0.55	-0.58	1.13	1.73	1.20	0.86	0.93	-1.19	1.03
Male	0.91	1.10	0.98	0.72	-1.64	1.87	0.82	1.32	0.45	0.53	0.39	1.11	0.31	1.20	-0.47	0.91	-0.69	1.01
Ethnicity - Nonwhite	-0.09	1.48	1.44	1.01	-0.91	2.61	1.89	1.83	1.04	0.72	-0.75	1.72	0.54	1.71	-0.78	1.35	-0.69	1.48
English: Good	0.04	1.57	0.16	1.02	1.94	2.69	-1.36	1.89	0.25	0.76	0.35	1.53	0.10	1.63	**-2.66***	1.25	-1.49	1.41
English: Fair	1.31	2.47	1.09	1.61	3.41	4.36	**-6.68***	3.04	1.27	1.25	0.51	2.28	1.80	2.48	0.45	1.85	-0.94	2.06
Fall Attendance	**3.96***	1.63	-0.23	1.07	0.20	2.73	**5.48****	1.97	0.96	0.79	1.25	1.63	-0.61	1.75	-0.66	1.33	**-3.72****	1.48
Spring Attendance	-2.69	1.56	0.49	1.05	1.56	2.67	-2.20	1.92	1.10	0.76	0.40	1.75	2.70	1.84	**-2.81***	1.41	1.09	1.54
Parent Ed. High School	**2.85$^+$**	1.63	0.79	1.09	1.34	2.80	1.45	2.00	79	0.79	0.42	1.62	1.42	1.71	0.92	1.33	-0.44	1.47
Parent Ed. College	0.23	1.60	1.10	1.06	-0.55	2.73	1.04	1.95	1.04	0.77	0.50	1.57	1.64	1.67	0.16	1.28	1.45	1.42

Source: Child Trends' analysis

Notes for all tables in Appendix E:

* identifies significance: $^+$p< .10, *p < .05, **p < .01, ***p < .001
Fall Attendance indicates in the two weeks prior to the fall direct assessment test date, the child attended every day or nearly every day. Spring Attendance indicates in the six months prior to the fall direct assessment test date, the child was rarely or

never absent (0-5% of the days). Variables in the model but not included in table are: intercept, missing ethnicity, missing English language skills, missing parental education, cohorts, assessment date. Child ethnicity-white, English language skill-poor, and parent education of college degree or above were included as reference categories.