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Exploring the Relationship Between Afterschool Program Quality and Youth Outcomes

Findings From the Palm Beach County Quality Improvement System Study—Summary

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Introduction

Since 2007, Prime Time Palm Beach County, Inc. has been taking meaningful and substantive strides in developing an afterschool quality improvement system (QIS) anchored to the quality criteria embedded in the Palm Beach County Program Quality Assessment (PBC-PQA). This system has been designed to help afterschool programs in Palm Beach County better understand what constitutes quality programming, how well they measure up to these criteria, and what steps can be taken to enhance program quality. In this sense, the QIS constructed by Prime Time has been developed to ensure that the afterschool programs it serves are of higher quality in terms of design, delivery, and adherence to standards.

Given the investment Prime Time has made in designing and developing its QIS and the relative maturity of the system, the timing seemed right to explore the relationship between afterschool program quality facilitated by Prime Time and a variety of youth outcomes. Prime Time has accumulated a series of extensive, longitudinal data sets regarding afterschool program quality among the individual programs it has served over the last five years, allowing for a robust examination of the relationship between program quality and youth outcomes. As a result, Prime Time is in a unique position to make a powerful contribution to the afterschool field, as well as gain important and meaningful insights into the impact of its work through a well-planned and implemented youth outcome study.

In 2013, Prime Time contracted with the American Institutes for Research (AIR) to design and conduct such a youth outcome study exploring the relationship between levels of quality practice and education-related outcomes based on data obtained from the School District of Palm Beach County. More specifically, the study was designed to answer the following research question: *What impact does participation in higher quality afterschool programs have on youth outcomes compared with similar youth participating in lower quality afterschool programs?*

This question is directly aligned with the mission of Prime Time, which is oriented toward helping lower quality afterschool programs progress to higher levels of program quality. By answering this question, Prime Time would have information about the impact on youth outcomes when students attend high-quality programs as opposed to those characterized by lower quality.

To answer this research question, AIR worked with Prime Time, the Palm Beach Children's Services Council, and the School District of Palm Beach County to obtain the program quality, youth afterschool participation, and youth outcome data needed to carry out three primary tasks.

1. *Assign afterschool programs served by prime time to quality profiles.* A key component of the study was to develop a method to assign more than 100 afterschool programs enrolled in the QIS administered by Prime Time into different higher and lower quality profiles. The goal was to define quality profile types that were different from one another in ways that are hypothesized to have substantive ramifications for how youth engage in and benefit from afterschool programming.
2. *Create meaningful comparison groups.* In answering the primary research question, steps were taken to construct both a treatment and a comparison group. The treatment group was comprised of those youth attending higher quality programs that participated in

afterschool programming regularly during the 2011–12 school year. The primary hypothesis guiding the proposed study is that youth who participate regularly in higher quality programs will demonstrate better functioning on a variety of youth outcomes. The comparison group was made up of similar youth attending lower quality programming. The comparison group was constructed employing a method called propensity score matching, which allowed the research team to control for selection bias in much the same way as a random assignment design would.

3. *Conduct impact analyses.* After the comparison groups had been created, multilevel models were run to assess the impact of participation in higher quality afterschool programming on youth outcomes compared with youth enrolled in lower quality programs. The outcomes examined include levels of school-day attendance, disciplinary referrals, grade promotion, and assessment scores in reading and mathematics. Aside from the random assignments of youth to treatment and control groups, this approach was the most robust analysis that could be undertaken to assess the impact of program participation in higher quality programs on a variety of youth outcomes. Because of the manner in which comparison groups were constructed, significant, positive effects, if found as hypothesized, could be interpreted as participation in higher quality programming causing a given outcome.

This report provides a description of what steps were taken to by the research team at AIR to carry out each of these three steps, a summary of key findings, and recommendations for how study results can be used Prime Time to develop and refine its QIS and construct an internal research and evaluation agenda to explore how different levels of afterschool program quality may impact youth outcomes.

Assigning Afterschool Program to Quality Profiles

The purpose of this section of the report is to outline the steps taken to complete task one described above, *Assign afterschool programs served by prime time to quality profiles*. Creation of the quality profiles was critical in ensuring the viability of the study. The research team at AIR wants to be sure the steps taken in the process of constructing the quality profiles used in this report are clearly articulated and replicable to support similar studies that may be undertaken in the future by Prime Time or other afterschool systems with similar QISs in place.

In the sections that follow, first steps are taken to explain how longitudinal PBC-PQA Form A data were analyzed to craft both higher and lower quality profiles. Next, how membership in a higher or lower quality profile was found to be related to program characteristics like school- or center-based status or the grade level of youth served is explored and summarized. Finally, the relationship between membership in a higher or lower quality profile and key facets of afterschool program operation related to or influenced by program quality are explored, including:

- *Changes in Form A PBC-PQA scores over time*. The goal here was to explore whether programs assigned to a given profile were generally improving, staying the same, or witnessing a decline in performance over time.
- *Performance on the Form B PBC-PQA.* The Form B PBC-PQA is an interview-based quality assessment tool oriented at assessing how well a program is engaging in *organizational processes* likely to support quality service provision.
- *Staff mobility from one program year to the next*. It was hypothesized that improvements in program quality resulting from QIS participation would have the effect of enhancing staff retention across program years.
- *Youth participation and retention in afterschool programming*. Here again, it was hypothesized that higher levels of programs quality would be associated with higher levels of afterschool program attendance and retention across program years.

The purpose of exploring the relationship between membership in a higher or lower quality profile and each of these elements was to ensure that there were meaningful differences between programs in each of these quality groups on facets of program operation that were likely to be correlated with levels of quality measured by the Form A PBC-PQA. If relationships were found to exist in the direction and strength hypothesized, then additional confidence could be had in the substantive difference between the higher and lower quality groups, thereby enhancing the likelihood that significant differences in youth outcomes would be witnessed between the two groups.

Form A PBC-PQA Data

Longitudinal data from the Form A PBC-PQA was the primary source of information relied on to sort afterschool programs into higher and lower quality groups. The Form A PBC-PQA is an observation-based quality assessment tool developed and supported by the Weikart Center for Youth Program Quality. The Form A PBC-PQA is made up a series rubric-based items organized into four broad domains that are scored by an external rater who observes the actual

delivery of afterschool programming to participating youth. As outlined in Figure 1, the four broad domains are *safety*, *supportive environment*, *interaction*, and *engagement*. Each domain is made up a series of subdomain or scales, which in turn are comprised of anywhere from two to six items that are scored by the observer. The scales appearing on Form A PBC-PQA are outlined as follows:

1. Safe Environment
    a. Cultural competence
    b. Physical environment
    c. Emergency and safety procedures
    d. Program space and materials
    e. Food and drink

2. Supportive Environment
    a. Staff provide a welcoming atmosphere.
    b. Session flow is planned, presented, and paced for youth.
    c. Staff effectively maintain clear limits.
    d. Activities support active engagement.
    e. Staff support youth in building new skills.
    f. Staff support youth with encouragement.
    g. Staff encourage youth to manage feelings and resolve conflicts appropriately.

3. Interaction
    a. Youth have opportunities to develop a sense of belonging.
    b. Youth have opportunities to participate in small groups.
    c. Youth have opportunities to act as group facilitators and mentors.
    d. Youth have opportunities to partner with adults.
    e. Youth have opportunities to develop positive peer relationships.

4. Engagement
    a. Youth have opportunities to set goals and make plans.
    b. Youth have opportunities to make choices based on their interests.
    c. Youth have opportunities to reflect.

Also, as demonstrated in Figure 1, each of the four broad domains represented in the PBC-PQA are organized in a hierarchical fashion, with lower levels of the pyramid theorized as needing to be in place before higher levels of the pyramid can be reached. For example, youth participating in an afterschool activity need to feel safe before they can experience a supportive, interactive, or engaging environment. Items represented in a given domain describe the types of supports and

opportunities afterschool activity leaders should provide to youth to create each of the primary experiences detailed in the quality pyramid.

Figure 1. PBC-PQA Domains Organized by Quality Pyramid

Starting with the 2007–08 school year, afterschool programs enrolled in the QIS were visited three times a year by a quality advisor employed by Prime Time who scored one PBC-PQA per visit.[1] Scores resulting from a visit were then shared with the program in question, whose staff then used this information in conjunction with self-assessment results to support the development of a program improvement plan oriented as enhancing the adoption of quality instructional practices in targeted areas. Based on the visits conducted by quality advisors over five years, the research team at AIR was provided with a data set that was comprised of 1,239 scored PBC-PQAs from 115 different afterschool program visited during a period spanning the 2007–08 to 2011–12 school years. A given program may have had PBC-PQA scores for a single year during this time period or up to five years of scores.

For the purposes of the proposed study, the central concern was how well a given program scored on the PBC-PQA during the course of the 2011–12 school year given this is period for which education-related outcomes were requested from the School District of Palm Beach County.

A decision was also reached by the research team to include only programs in the study that had at least two years of PBC-PQA data available to explore the consistency of scores across time and if the program was on an ascending, descending, or stable trend in terms of PBC-PQA-estimated program quality. A total of 108 afterschool programs represented in the PBC-PQA

[1] It is important to note that most observations were conducted across a 1- to 3-day period of program operation, meaning the scores represented program operation at a specific point in time within the confines of a given school year.

data set were found to meet both of these criteria: (1) scores for the 2011–12 school year and (2) at least two years of consecutive PBC-PQA scores. The number of years a given program had PBC-PQA data for is outlined in Table 1. As shown in Table 1, approximately two thirds of the programs represented in the PBC-PQA data set had PBC-PQA scores for 4 or 5 consecutive years.

Table 1. Number of Afterschool Programs by Number of Years With PBC-PQA Scores

Number of Years of PBC-PQA Data	Number of Programs	Percentage of Programs
Two	28	25.9%
Three	12	11.1%
Four	26	24.1%
Five	42	38.9%
Total	108	100.0%

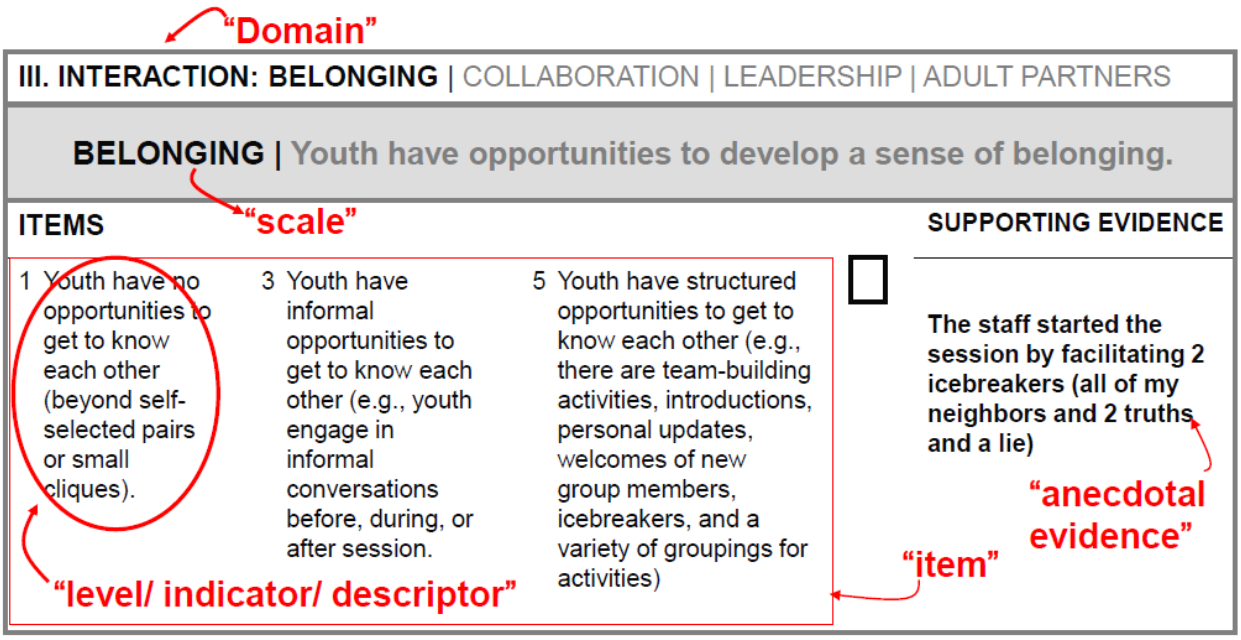
The information presented in Table 1 also demonstrates that program exposure to the quality building activities supported by the Palm Beach QIS did vary, and as a result, it was expected that the level of observed PBC-PQA quality would be related to the length of time a given program had been enrolled in the QIS.

Scoring the PBC-PQA with Rasch Analysis-Based Approaches

To make effective use of the PBC-PQA data set provided to AIR research team, we first had to ensure the data we were working with was both *reliable* and *representative* of the constructs being measured (i.e., the primary PBC-PQA domains of *safety*, *supportive environment*, *interaction*, and *engagement*). Rasch analysis techniques were employed to assess how well the data received from Prime Time met each of these criteria. In this section of the report, steps are taken to briefly describe how the PBC-PQA is typically scored by observers and how we deviated from these approaches using Rasch analysis techniques to more carefully explore and ensure the data we were working with was psychometrically reliable and valid.

Each item contained on the PBC-PQA describes the extent to which the afterschool staff being observed adopted a particular instructional practice or provided specific opportunities to youth attending the activity that are based in the youth development literature on what constitutes effective practice (see Figure 2 for an example). When scoring the PBC-PQA, observers select either a 1, 3, or 5 for a given item found on the tool depending on whether a given quality practice was largely absent from the activity observed (1), whether the practice was somewhat present (3), or whether the practice was widely present or implemented to a significant and meaningful degree (5). When normally scoring the PBC-PQA, the mean of the item scores comprising a given scale is first calculated and the mean of the scales are averaged to calculate a domain score respectively for safety, supportive environment, interaction, and engagement. Scale scores are also averaged to calculate a total score for the PBC-PQA. In the data set received from Prime Time, the scales, domain, and total scores were provided, as well as scores assigned to individual items appearing on the PBC-PQA.

Figure 2. Example of a PBC-PQA Item



Even though each of these score types were provided to AIR, the AIR research team opted to re-score the PBC-PQA data using Rasch analysis approaches. Rasch modeling techniques were used to obtain estimates of both a program's level of *observed quality* AND the *relative difficulty* of a given item appearing on the PBC-PQA. In terms of item difficulty, some items appearing on the PBC-PQA are easier than others for activities being observed to receive a 5 rating by a Prime Time quality advisor. Rasch analyses *quantify* how much more difficult one item is from another. A good example of how this works in practice is computer adaptive testing. If a student misses a question on a computer-based assessment, then the program will give the student being tested an easier item next to calibrate the student's underlying ability. The rules that govern which item in a bank of items is easier or harder are predicated on the types of item difficulty estimates that result from the application of Rasch approaches. Ideally, a scale appearing on a tool like the PBC-PQA will have a mix of easy and difficult items, so there is a greater chance of determining where, in our case, a given program lies along the quality continuum on a given domain of the PBC-PQA.

Rasch approaches also put quality estimates and item difficulty estimates on the same scale, allowing them to be compared directly. As will be demonstrated in later sections of this report, this particular characteristic of how estimates are derived from the application of Rasch analysis techniques helped to anchor the interpretation of PBC-PQA scores to the probability that a given program will receive a rating of 5 on a particular item appearing on the tool. This type of information was helpful in exploring how programs assigned to lower and higher quality profiles were different from one another in terms of the types of PBC-PQA items they were likely to receive a rating of 5 by a quality advisor.

In addition, Rasch approaches were also used to score the PBC-PQA data obtained from Prime Time for four additional reasons.

1. *To explore whether the type of activity observed was related to PBC-PQA scores.* In past evaluation projects undertaken by the AIR evaluation team (Naftzger, Nistler, et al., 2013, Naftzger, Vinson, et al., 2013), the type of activity being observed was found to be systematically related to the PBC-PQA-derived quality score for the activity in question, with *recreation* and *tutoring/homework help* activities more likely to receive lower PBC-PQA scores than *enrichment* activities (see Appendix A for definitions of each of these activities). The AIR research team wanted to explore whether a similar finding would be found in relation to the Prime Time PBC-PQA data set and assess what impact such a relationship may have on the formation of quality profiles.
2. *Explore whether the 3-point rating scale used on the PBC-PQA (1,3, or 5) was functioning well from a psychometric perspective.* Past work by the evaluation team in working with PBC-PQA-related data has suggested that a dichotomous approach to scoring the PBC-PQA, where each item either receives a score of *5* or not, is a more psychometrically valid way to score the instrument, as compared to using the 1, 3, 5 rating scale appearing in the tool (Naftzger, Nistler, et al., 2013, Naftzger, Vinson, et al., 2013). Steps were also taken to explore whether this was true in relation to the Prime Time data set as well using Rasch analysis approaches.
3. *Determine whether the items associated with a given domain were providing quality estimates from a single latent construct (unidimensionality).* One of the key assumptions

underpinning most psychometric analyses is that only one construct (e.g., engagement would be an example of a construct) is being measured through a given bank of items appearing on an instrument. Application of the Rasch model produces output that allows for this assumption to be verified, or in the case where this assumption is not met, determine which specific items are associated with the multiple constructs being measured.

4. *Explore whether the items associated with a given domain were providing quality estimates that allowed for the adequate separation of programs from a quality perspective (separation reliability).* Given the primary task of attempting to develop quality profiles that distinguish higher quality from lower quality programs, it was important to understand whether the PBC-PQA data collected by the Prime Time quality advisors was *separating* programs into discernible tiers of quality, providing a capacity to distinguish one program from another in terms of quality. The Rasch analyses undertaken in preparation of the quality profiles allowed for a more thorough examination of this issue. In this sense, too little variation between program quality estimates would result in lower reliability estimates for the measure and would serve to impede our ability to define lower and higher quality profiles that would be substantively different from one another.

As a result of these analyses, some items and scales were dropped and a dichotomous approach to scoring the PBC-PQA was adopted (either an item received a rating of 5 or it did not). These changes were made to enhance the reliability of the data. More details on the findings and the solutions implemented to address each of these issues are described in greater detail in Appendix A.

These analyses resulted in a total of nine of the 20 scales represented on the PBC-PQA being dropped from efforts to develop quality profiles that were predicated in scores that could best distinguish lower and higher quality programs and were functioning in an optimal manner from a psychometric perspective. Items retained for the construction of quality profiles were associated with the following PBC-PQA subdomains and scales:

1. Revised *supportive environment* scale
    a. Activities support active engagement.
    b. Staff support youth in building new skills.
    c. Staff support youth with encouragement.
2. Revised *interaction* scale:
    a. Youth have opportunities to develop a sense of belonging.
    b. Youth have opportunities to participate in small groups.
    c. Youth have opportunities to partner with adults.
    d. Youth have opportunities to develop positive peer relationships.
3. Revised *engagement* scale:
    a. Youth have opportunities to act as group facilitators and mentors.
    b. Youth have opportunities to set goals and make plans.

c. Youth have opportunities make choices based on their interests.

d. Youth have opportunities to reflect.

It is important to note that these steps were taken to best support the purposes of this study, which are different in using a tool to support a QIS oriented at improving afterschool program quality. The reader is encouraged to keep this distinction in mind when reviewing the results.

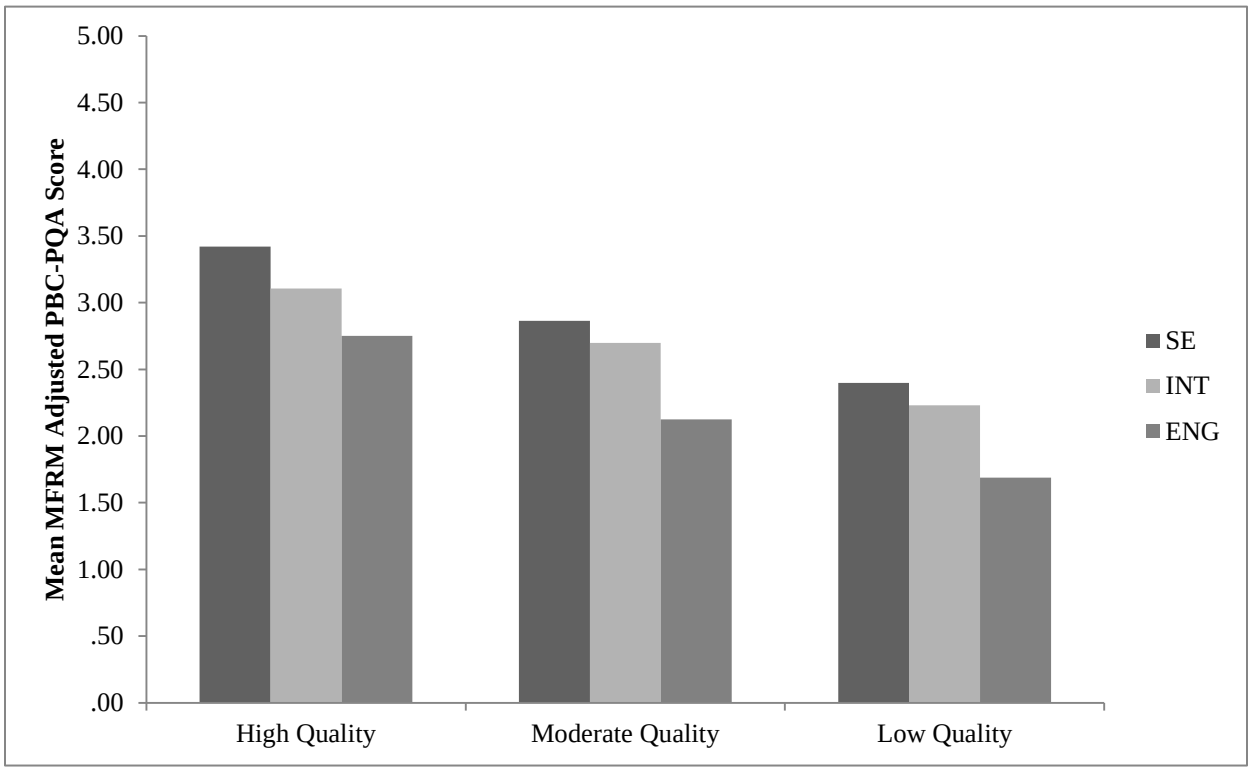
Cluster Analyses to Create Preliminary Quality Profiles

The next step in the process of selecting programs for inclusion in higher and lower quality profiles was to use the Rasch-calibrated scores to form quality grouping using cluster analysis. Typically, cluster analysis is employed to combine cases (or, in this case, afterschool programs) into groups using a series of variables as criteria to determine the degree of similarity between individual cases, and it is particularly well suited when there is a desire to classify a large number of cases into a smaller domain of discrete groupings. Our goal was to use cluster analysis to form initial quality grouping based on the observed level of quality on the revised supportive environment, interaction, and engagement scales of the PBC-PQA.

To start this process, final calibrations for each modified PBC-PQA domain obtained from the application of Rasch techniques were then imported back into SPSS and converted from a logit scale to a 0–5 scale. Generally, these adjusted scores based on Rasch analyses were lower than the raw scores based on the typical approach to scoring the PBC-PQA. This yielded a file with 413 yearly quality estimates for the 115 afterschool programs with data associated with the 2011–12 school year.

Next hierarchical cluster analyses using the Rasch-derived scale scores for supportive environment, interaction, and engagement were used to classify each yearly quality estimate into anywhere from 2 to 5 quality groupings or clusters. Ultimately, the number of quality profiles selected was based on how well the categories differentiated programs into homogenous categories that made good interpretative sense. Generally, the three-cluster solution was deemed to yield the most appropriate fit (see Figure 3).

Figure 3. Three-Cluster Solution Employing Many-Facet Rasch Measurement (MFRM)-Derived PBC-PQA Scale Scores by Domain



As demonstrated in Figure 3, the three-cluster solution yielded a higher quality cluster (n = 135 annual program quality estimates), a moderate quality cluster (n = 130 annual program quality estimates), and a lower quality cluster (n = 148 annual program quality estimates). Across all three clusters, scores followed a similar pattern of decline, with the highest score associated with supportive environment (SE) and then declining with interaction (INT) and engagement (ENG). This trend is representative of the quality pyramid employed by the Weikart Center to demonstrate the developmental nature of the PBC-PQA (see Figure 1), in which the implementation of practices designed to support youth interaction and engagement were more difficult to accomplish than practices appearing at lower levels of the pyramid. The programs assigned to the higher quality cluster had the highest scores across all three domains on average, whereas programs in lower quality cluster had the lowest scores on average.

It is also important to note that the levels of performance in Figure 3 represent the average Rasch-adjusted PBC-PQA scores among programs assigned to that cluster. For example, among programs in the higher quality group, the average Rasch-adjusted score on the supportive environment scale was 3.42, whereas for the lower quality cluster, the average adjusted score on this domain was 2.40.

As mentioned previously, to address the central research question underpinning this study, the programs to be included in the analysis were limited to those programs found to participate in the QIS during the 2011–12 school and had participated in the QIS for at least one year previously. Of the 108 programs meeting these criteria, 62 were identified as falling in the higher quality

cluster and 23 were found in the lower quality cluster. The relatively higher proportion of programs assigned to the higher quality cluster (57 percent of the 108 programs) as compared to the lower quality cluster (21 percent of the 108 programs) is likely an indication of how participation in the QIS has helped lift a significant portion of the afterschool programs in Palm Beach to a higher level of quality. Most of the 62 programs in the higher quality cluster had demonstrated significant gains in quality over multiple years of participation in the QIS.

Refining the Quality Profiles to Maximize the Contrast Between Higher and Lower Quality Programs

Although cluster analysis was a useful technique for initially classifying programs into different quality groupings, the three-cluster solution selected in Figure 3 still involved some degree of overlap in terms of performance on a given PBC-PQA domain among programs in different clusters. For example, Rasch-adjusted scores on the supportive environment scale for programs in the 62 programs active in 2011–12 in the higher quality cluster ranged from 2.52 to 4.79. For the 23 programs in the lower quality cluster, this range was 1.96 to 3.14.

For the purposes of this study, this degree of overlap in scores across the higher and lower quality groups was deemed to be undesirable. Two strategies were employed to cull both the higher quality and lower quality groups to achieve a greater contrast in PBC-PQA performance across the programs represented in each group.

1. *Ensure there was a significant difference in terms of performance on the engagement scale of the PBC-PQA between programs in the higher and lower quality groups.* Given the developmental nature of the PBC-PQA, it was expected that the difference between higher and lower quality groups should be greatest on the engagement scale of the instrument because lower quality programs are less apt to have achieved a level of functioning where widespread adoption of practices related to engagement are likely to have taken root. In light if this hypothesis, steps were taken to quantify what would constitute a significant difference ($p < .10$) between the highest engagement score among the *lower quality* group and the lowest engagement score in the *higher quality* group. This threshold was then used to remove 37 programs from the *higher quality* group that were not significantly higher on the engagement scale than the highest scoring program in the *lower quality* group. In taking this step, 25 programs were left in the higher quality group and 23 programs in the lower quality group.
2. *Ensure there was no score overlap in terms of performance on the supportive environment and interaction scales of the PBC-PQA in the higher and lower quality groups.* Next, steps were taken to eliminate *high*-performing programs in the *lower quality* group and *low*-performing programs in the *higher quality* group, which had either supportive environment or interaction scores that overlapped with the performance of programs in the other group. Taking these steps resulted in the elimination of six additional programs in the *higher quality* group and four programs in the *lower quality* group, resulting in a total of 19 programs in the higher quality group and 19 programs in the lower quality group.

These 19 higher and lower quality groups represented the domain of programs that were used to explore how youth attending programs in each group fared on youth outcomes described subsequently in this report.

However, we were still interested in understanding more fully how these groups differed on specific aspects of program quality so we could better describe what really distinguished programs in the lower and higher quality profiles in terms of program quality and how substantive these differences were.

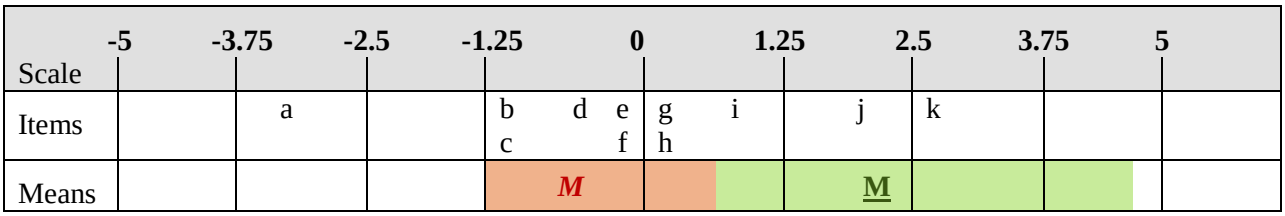
Toward this end, steps were taken to examine whether the 19 higher and lower quality programs were substantively different from one another by directly comparing *domain level scale scores* from the PBC-PQA with *item difficulty estimates* for each group. As mentioned, one of the advantages of Rasch techniques is that quality estimates can be placed on the same scale as item difficulty estimates, allowing the two to be compared directly.

For example, in Figure 4, the comparison of item difficulties with both the range and average quality scores for both the higher and lower quality groups is shown in relation to the supportive environment scale. The scale or ruler used to make these comparisons is shown by the gray-shaded row at the top of the figure labeled *scale*. The scale shown in Figure 4 is in logits and ranges from -5 to 5. As described, this scale can be thought of as the "quality ruler" for the supportive environment scale.

Items are represented on the next row the figure. Items with low item difficulty estimates like item a (*during activities, staff are almost always actively involved with youth*) are the easiest for an activity being observed to receive a rating of 5 on when scored by the observer. In contrast, item k (*Staff support at least some contributions or accomplishments of youth by acknowledging what they have said or done with specific, nonevaluative language*) is the most difficult. The distance between items demonstrates how much more difficult or easy an item is from another. For example, item b [*Activities are appropriately challenging (not too easy, not too hard) for all or nearly all of the youth; there is little or no evidence of boredom or frustration on the part of youth*], which has an item difficulty estimate of -1.23, is more than twice as difficult as item a, which has an item difficulty value of -3.29. Stated another way, an activity being observed has a much greater chance of getting a rating of 5 on item a as opposed to item b; in fact, it is more than twice as likely that this will occur.

A summary of the performance of programs in the higher and lower quality groups is provided in the *means* row of the figure. For example, the italicized *M* appearing in red font at about -.41 logits represents the mean logit score of programs in the *lower quality* group on the supportive environment scale. It is important to note that this mean score can be compared directly with the items represented in Figure 4. For example, if a program scored at the lower quality group mean (-0.41 logits), then they would have a greater than 50 percent probability of getting a rating of 5 on items a–c because these items have item difficulty estimates less than -0.41 logits. In a similar fashion, they would have less than a 50 percent probability of getting a rating of 5 on items with item difficulty estimates greater than -0.41 logits (items d–k). In this sense, we can say that the average program in the lower quality group has most probably mastered practices articulated in items a–c but still has work to do in adopting practices described in items d–k.

Figure 4. Item Difficulty and Quality Estimate Comparisons for the Higher and Lower Quality Groups—Supportive Environment



		Lower Quality	Higher Quality
Item Label	**Item Description**	**Score at Mean 50% Chance of Getting a 5**	**Score at Mean >50% Chance of Getting a 5**
a	During activities, staff are almost always actively involved with youth.	✔	✔
b	Activities are appropriately challenging (not too easy and not too hard) for all or nearly all of the youth; there is little or no evidence of boredom or frustration on the part of youth.	✔	✔
c	The bulk of the activities involve youth in engaging with (creating, combining, and reforming) materials or ideas or improving a skill though guided practice.	✔	✔
d	All youth are encouraged to try out new skills or attempt higher levels of performance.		✔
e	The activities provide all youth one or more opportunities to talk about (or otherwise communicate) what they are doing and what they are thinking about to others.		✔
f	Staff provide intentional opportunities for development of specific skills (as opposed to activities with just a recreation or "having fun" focus) for all youth in the session.		✔
g	All youth who try out new skills receive support from staff despite imperfect results, errors, or failure; staff allow youth to learn from and correct their own mistakes and encourage youth to keep trying to improve their skills.		✔
h	The program activities lead (or will lead in future sessions) to tangible products or performances that reflect ideas or designs of youth.		✔
i	The activities balance concrete experiences involving materials, people, and projects with abstract concepts.		✔
j	Staff make frequent use of open-ended questions.		✔
k	Staff support at least some contributions or accomplishments of youth by acknowledging what they have said or done with specific, nonevaluative language.		

This finding takes on added meaning when the actual practices detailed by these different groupings of items are taken into consideration. For example, items a–c relate to ensuring staff are working with youth (item a), pacing and activity challenge is developmentally appropriate (item b), and youth have opportunities to engage in the tasks at hand (item c). Starting with item d and continuing through item g, staff are beginning to take a more active role in supporting youth skill building. In this sense, the average lower quality program has largely mastered basic elements of activity delivery like staff involvement and pacing but need to continue to develop in engaging in more meaningful approaches to support skill building among participating youth.

In contrast, the average program in the higher quality group has a mean supportive environment score of 2.31 logits. In this case, a program performing at the average level in the higher quality group has a greater than 50 percent probability of getting a rating of 5 on all items represented on the supportive environment scale other than item k (*Staff support at least some contributions or accomplishments of youth by acknowledging what they have said or done with specific, nonevaluative language*). In this sense, the average program in the higher quality group has largely mastered the full domain of practices identified in the supportive environment portion of the scale, including those indicative of a more active and mature approach to supporting youth skill building. In this sense, there are some very clear differences in terms of what the average program in each group has mastered in the way of practices articulated in the PBC-PQA items. In examining these differences, we can gain an additional understanding of how the lower and higher quality groups are different from one another.

However, it is important to note that programs in both the higher and lower quality groups received a range of scores on the supportive environment scale, while not overlapping, were in some cases relatively close to one another. As shown by the red shaded area in the *means* row of Figure 4, logit scores among programs in the lower quality group ranged from -1.11 to 0.66 logits, so high-functioning programs in this group were likely to get ratings of 5 on items a–h. Programs in the higher quality groups ranged from 0.84 to 4.45 logits as shown by the green shaded area in the *means* row of the figure. In this sense, the transition from membership in the lower to higher quality group is not defined by a substantive gap in performance between the two groups. As noted previously, such dramatic shifts in performance were viewed as less critical in distinguishing the higher and lower performing groups given that practices detailed in items appearing on the supportive environment represent a more basic level of the pyramid of quality described by the Weikart Center. In this sense, less variation would be expected to characterize the two groups on this scale.

Generally, however, the information presented in Figure 4 points to important differences between how programs in the lower and higher quality groups were found to be performing in relation to the supportive environment scale. In Figures 5 and 6, similar charts have been created in relation to the interaction and engagement scales.

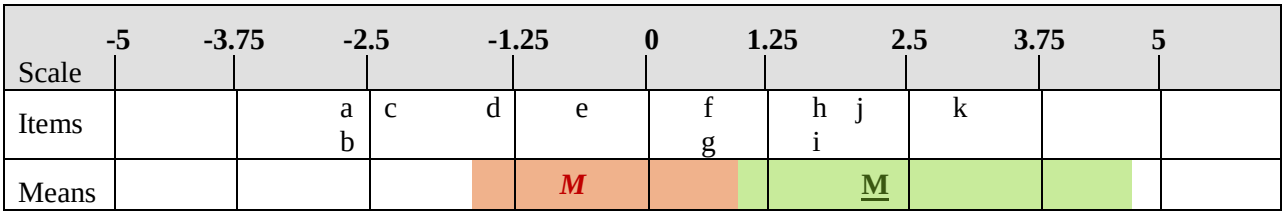
As shown in Figure 5, on the interaction scale, a pattern similar to the supportive environment scale is evident. In this figure, the average logit score among programs in the lower quality group (as denoted by the red, italicized *M* in the means rows of the figure) suggests that there are only four items on the interaction scale where the average program in this group would have a probability of greater than 50 percent of getting a rating of 5 on when rated by the observer (items a–d).

1. Youth mainly smile, use friendly gestures, and make eye contact with each other (item a).
2. Youth mainly use a warm tone of voice and use respectful language with each other (item b).
3. Youth exhibit predominately inclusive relationships with all in the program offering, including newcomers (item c).
4. Staff always provide an explanation for the expectations, guidelines, or directions given to youth (item d).

In contrast, the average program in the higher quality group (denoted by the green, underlined M in the means row of the figure) has a probability of getting a five on all items on the interaction scale, with the exception of item k (*Staff use two or more ways to form small groups*).

In this sense, programs in the lower quality group were likely less skilled in using different grouping strategies to support positive interactions among participating youth (items f, j, and k), providing structured opportunities for youth to get to know each other (item h), and publicly recognizing youth contributions (item i). Also, like the supportive environment scale, while there was no overlap in scores, there was also no substantive leap in performance when comparing the score ranges of the lower and higher quality groups.

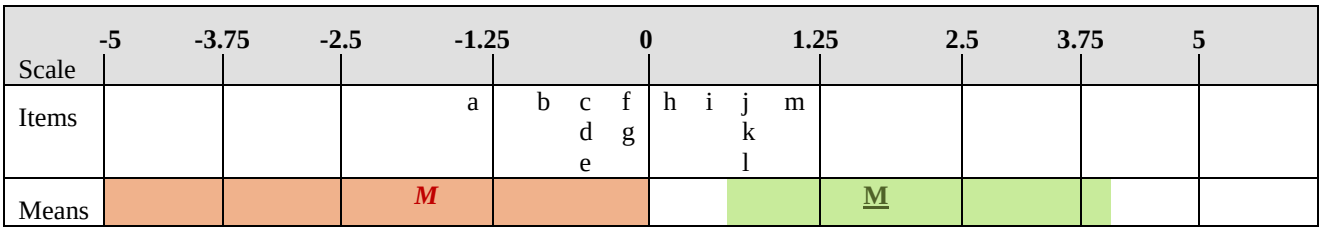
Figure 5. Item Difficulty and Quality Estimate Comparisons for the Higher and Lower Quality Groups—Interaction



		Lower Quality	Higher Quality
Item Label	**Item Description**	**Score at Mean >50% Chance of Getting a 5**	**Score at Mean >50% Chance of Getting a 5**
a	Youth mainly smile, use friendly gestures, and make eye contact with each other.	✔	✔
b	Youth mainly use a warm tone of voice and use respectful language with each other.	✔	✔
c	Youth exhibit predominately inclusive relationships with all in the program offering, including newcomers.	✔	✔
d	Staff always provide an explanation for expectations, guidelines, or directions given to youth.	✔	✔
e	Youth strongly identify with the program offering.		✔
f	Each small group has a purpose (i.e., goals or tasks to accomplish), and all group members cooperate in accomplishing it.		✔
g	Staff share control of most activities with youth, providing guidance and facilitation while retaining overall responsibility		✔
h	Youth have structured opportunities to get to know each other.		✔
i	The activities include structured opportunities to publicly acknowledge the achievements, work, or contributions of at least some youth.		✔
j	Session consists of activities carried out in at least three groupings—full, small, or individual.		✔
k	Staff use two or more ways to form small groups.		

A slightly different pattern is demonstrated in Figure 6 in relation to the engagement scale. In this case, the average program in the lower quality group was found not to have a greater than 50 percent probability of receiving a rating of 5 on any of the items represented in the revised engagement scale. In contrast, the average program in the higher quality group had a greater than 50 percent probability of receiving a rating of 5 on all the items. In addition, there is also a noticeable gap between the highest scores in the lower quality group and the lowest scores in the highest quality as shown in by the gap between the shaded regions in the *Means* row of the figure. This gap is reflective of the choice made by the AIR research team to ensure there was at least a moderately significant difference ($p < .10$) in performance on the engagement scale between all programs represented in the lower and higher quality groups.

Figure 6. Item Difficulty and Quality Estimate Comparisons for the Higher and Lower Quality Groups—Engagement



		Lower Quality	Higher Quality
Item Label	**Item Description**	**Score at Mean >50% Chance of Getting a 5**	**Score at Mean >50% Chance of Getting a 5**
a	All youth have multiple opportunities to practice group-process skills.		✔
b	All youth have the opportunity to make at least one open-ended process choice.		✔
c	In the course of the program offering, all youth have structured opportunities to make presentations to the whole group.		✔
d	Staff initiate structured opportunities for youth to give feedback on the activities.		✔
e	All younger (Grades K–6) youth have one or more opportunities to help another youth with a task during program activities; all older (Grades 6+) youth have one or more opportunities to mentor an individual during program activities.		✔
f	All youth have the opportunity to make at least one open-ended content choice within the content framework of the activities.		✔
g	All youth are engaged in an intentional process of reflecting on what they are doing or have done.		✔
h	In the course of the program offering, all youth are given a structured opportunity to set one or more long-term goals.		✔
i	Time is regularly provided for young people to make (individual or group) plans for and/or to set goals for activities.		✔
j	During activities, all youth have one or more opportunities to mentor an individual.		✔
k	Young people are encouraged to share their plans and represent their plans in a tangible way using words, writing,		✔

		Lower Quality	Higher Quality
Item Label	**Item Description**	**Score at Mean >50% Chance of Getting a 5**	**Score at Mean >50% Chance of Getting a 5**
	diagram, etc.		
l	All youth are given the opportunity to reflect on their activities in two or more ways.		✔
m	During activities, all youth have one or more opportunities to lead a group.		✔

Generally, it is the sense of the AIR research team that the differences described in Figures 4 through 6 are critical to understanding how programs represented in the lower and higher quality groups were different in the adoption of practices described in each domain of the PBC-PQA. It is also our opinion that such approaches may be useful to thinking more carefully about how standards may be set for PBC-PQA related performance, linking performance thresholds to the probability that a program is likely to demonstrate mastery of a given set of practices that represent a key stage in the development of higher quality afterschool programs. Steps can also be taken to use this information to target more accurately what practices a given tier of programs should be working on and customize the types of supports they will need to improve practice in those areas.

Summary of Key Characteristics of Lower and Higher Quality Programs

With the lower and higher quality groups defined, steps were then taken to explore how programs in each group differed on key programming characteristics, including:

- The type of afterschool program (school based or center based)
- The number of years of QIS participation
- The grade levels of youth receiving child care subsidies supporting their program participation served by the programs in each group[2]

We wanted to look at these characteristic specifically because it was hypothesized that they could have either an impact on the PBC-PQA scores received by a given or, just an important, how youth were performing on the education-related outcomes examined later in the report.

In terms of the type of afterschool program, it was hypothesized that school-based programs may have certain advantages in supporting the academic-related outcomes examined in this report given enhanced access to information about student academic needs and details of the school-day curriculum. In this sense, alignment with school-day academic goals and instructional approaches would be easier in school-based, as opposed to center-based , programs.

As shown in Table 2, the programs assigned to the lower quality cluster were more likely to be school based as opposed to center based, while in the higher quality group, programs were slightly more likely to be center based. It is not clear why significant differences were observed in terms of center type in the lower quality cluster. This may require some additional investigation by the internal research and evaluation team at Prime Time, although there was some evidence provided in the data set provided by Prime Time that the involvement of school-based programs in the QIS was later in coming, which may partially explain the difference outlined in Table 2. In any event, the high level of school-related programs in the lower quality group is a concern, particularly in terms of how this may impact efforts to explore the difference between lower and higher quality programs on outcomes related to academic achievement.

Table 2. Center Type by Programs Assigned to Lower and Higher Quality Groups

	Lower Quality		Higher Quality	
Center Type	***n***	**%**	***n***	**%**
Center based	4	21.1%	11	57.9%
School based	15	78.9%	8	42.1%
Total	19	100.0%	19	100.0%

It was also deemed important to examine how the number of years of involvement in the QIS process may have been related to programs assigned to the higher and lower quality groups. It

[2] It is important to note that grade-level information was only available for those youth served by program the received public child care subsidies. These programs served a larger population of youth than those receiving subsidies, but demographic information about these youth, including grade level, is not available.

would be expected that longer involvement in the QIS process would be associated with membership in the higher quality groups. As shown in Table 3, this was shown to be the case. For example, approximately 84 percent of the higher quality programs had been enrolled in the QIS for 4–5 years. For the lower quality group, this percentage was 37 percent. Clearly, programs in the higher quality group had a broader exposure to the PBC-PQA instruments and related supports provide by Prime Time to cultivate a quality afterschool program.

Table 3. Center Type by Programs Assigned to Lower and Higher Quality Groups

	Lower Quality		Higher Quality	
Number of Years Enrolled in QIS	***n***	**%**	***n***	**%**
Two	7	36.8%	2	10.5%
Three	5	26.3%	1	5.3%
Four	0	0.0%	6	31.6%
Five	7	36.8%	10	52.2%
Total	19	100.0%	19	100.0%

In terms of the grade level of youth served, as shown in Table 4, programs across the two groups were largely consistent in terms of the number of youth by grade level receiving child care subsidies that attended their programs. This is important because the age of the youth involved in programming can have an impact on the relative ease or difficulty in implementing certain practices and approaches appearing on the PBC-PQA, which could ultimately impact a given program's score.

Table 4. Number of Youth Served by Grade Level by Programs Assigned to Lower and Higher Quality Groups

Grade	Lower Quality	Higher Quality
1	100	123
2	131	109
3	127	129
4	96	106
5	78	93
6	9	29
7	0	6
Total	541	595

Generally, the programs enrolled in the lower and higher quality groups were largely consistent and different in the ways expected, with the exception of the overrepresentation of school-based programs in the lower quality group, although it is suspected that this may be related to later enrollment of school-based programs in the QIS process. Nevertheless, this may have some

implications for being able to detect a significant difference between higher and lower quality groups on outcomes related to the academic achievement of participating youth.

Further Exploring Differences Between Lower and Higher Quality Programs

At this point, steps have been taken to articulate how lower and higher quality profiles were created from among the 108 programs active during the 2011–12 school year, as well as to highlight how these program were different in terms of both the probability of being able to implement practices related to the creation of higher quality settings for youth as outlined in the PBC-PQA and on key program characteristics.

The next step in the project was to explore whether program membership in either the lower or higher quality group was related to other facets of afterschool program operation and how PBC-PQA-assessed quality changed over time. In this sense, steps were taken to explore the relationship between membership in a higher or lower quality profile and key facets of afterschool program operation, including:

- Changes in Form A PBC-PQA scores over time
- Raw scores on the PBC-PQA
- Performance on the Form B PBC-PQA, the interview-based quality assessment tool oriented at assessing how well a program is engaging in *organizational processes* likely to support quality service provision
- Staff mobility from one program year to the next
- Levels of youth attendance and retention in programming

The purpose of exploring the relationship between membership in a higher or lower quality profile and each of these elements is to ensure that there are meaningful differences between programs in the higher and lower quality groups on facets of program operation that are likely to be correlated with levels of quality measured by the Form A PQA. If relationships are found to exist in the direction and strength hypothesized, then additional confidence can be had in the substantive difference between the higher and lower quality groups.

Changes in Form A PBC-PQA Scores Over Time

The central objective of the QIS managed by Prime Time is to support improvements in afterschool program quality based on the conception of afterschool program quality articulated in the PBC-PQA. It is expected, then, that as programs participate in the QIS, their PBC-PQA scores will improve over time. In this section of the report, steps are taken to explore how PBC-PQA scores changed over time among programs assigned to lower and higher quality groups. Change in PBC-PQA scores was examined using two primary approaches:

1. Change from one year to the next was examined for each of the three PBC-PQA domains under consideration (supportive environment, interaction, and engagement), and each program was assigned one of the following statuses:

- *All net increase*—For each of the three PBC-PQA domains, there were more years where there was significant[3] improvement from the scores in the prior year than years where there was no change or a significant decline.
- *All net decrease*—For each of the three PBC-PQA domains, there were more years where there was significant decline from the scores in the prior year than years where there was no change or a significant improvement.
- *All no change*—For each of the three PBC-PQA domains, there were no significant changes in scores from the prior year for all years the program was enrolled in the QIS.
- *Some increase*—For at least one PBC-PQA domain, there were more years where there was significant improvement from scores in the prior year, whereas there was one or more other PBC-PQA domain where there was no significant change in scores in the prior years for all years the program was enrolled in the QIS.
- *Some decrease*—For at least one PBC-PQA domain, there were more years where there was significant decline from scores in the prior year, whereas there was one or more other PBC-PQA domains where there was no significant change in scores in the prior years for all years the program was enrolled in the QIS.
- *Some increase, some decrease*—For at least one PBC-PQA domain, there were more years where there was significant improvement from scores in the prior year, while there was one or more other PBC-PQA domain where there was significant decline from scores in the prior year.

2. Change from baseline. The intent here was to examine the degree to which programs demonstrated a significant increase in performance in 2011–12 on each PBC-PQA domain relative to their first year of QIS enrollment. Programs were either identified as demonstrated a significant increase from baseline, no change, or a significant decrease.

In light of the goals associated with the QIS, it would be more desirable for a program to be coded as having an *all net increase* or at least *some increase*. In Table 5, the number and percentage of lower and higher quality programs are outlined by the cross-year status they were assigned based on the coding structure articulated previously. As anticipated, there were significant differences between membership in each group (chi-square = 22.4, $p < .001$), with close to 90 percent of programs in the higher quality group receiving a status of *all net increase* or *some increase*, whereas only 21 percent of programs in the lower quality group receiving a status of *some increase*. In this sense, not only did programs in the higher quality groups demonstrate a high level of performance on the PBC-PQA during the 2011–12 school year, but also by and large these programs had been on an upward trajectory in terms of improving program quality across multiple years of QIS enrollment. This was not the case in relation to the programs in the lower quality group, where over 60 percent of programs demonstrated either no significant change in quality or a decline in performance across some or all domains of the PBC-PQA.

[3] In this section, significant refers to $p < .10$.

Table 5. Summary of Annual PBC-PQA Changes in Performance Between Programs in Lower and Higher Quality Profiles

	Lower Quality Profile		Higher Quality Profile	
Change Status	***n***	**%**	***n***	**%**
All net increase	0	0.0%	11	57.9%
Some increase	4	21.1%	6	31.6%
No change	3	15.8%	1	5.3%
Some increase/some decrease	3	15.8%	1	5.3%
Some decrease	8	42.1%	0	0.0%
All decrease	1	5.3%	0	0.0%
Total	19	100.0%	19	100.0%

The extent to which lower and higher quality programs demonstrated a significant improvement[4] in PBC-PQA scores from baseline is outlined in Table 6. As anticipated based on the results outlined in Table 5, the percentage of programs represented in the higher quality group that demonstrated significant improvement in scores from baseline ranged from 84 percent in relation to supportive environment to 100 percent in relation to engagement. For the lower quality group, the plurality of programs either witnessed no significant change in scores from baseline or a significant decline, further reinforcing the conclusion that higher and lower quality programs were on different quality improvement trajectories as a result of QIS involvement.

Table 6. Summary of Changes in Performance From Baseline Between Programs in Lower and Higher Quality Profiles by PBC-PQA Domain

Change From Baseline	Supportive Environment				Interaction				Engagement			
	Lower Quality		Higher Quality		Lower Quality		Higher Quality		Lower Quality		Higher Quality	
	n	**%**	***n***	**%**	***n***	**%**	***n***	**%**	***n***	**%**	***n***	**%**
Significant Improvement	0	0.0%	16	84.2%	7	36.8%	17	89.5%	4	21.1%	19	100.0%
No Change	11	57.9%	3	15.8%	8	42.1%	2	10.5%	7	36.8%	0	0.0%
Significant Decline	8	42.1%	0	0.0%	4	21.1%	0	0.0%	8	42.1%	0	0.0%
Total	19	100%	19	100%	19	100%	19	100%	19	100%	19	100%

Raw Scores on the PBC-PQA

Most studies that involve the use of PBC-PQA data have a tendency to rely on total scores calculated using the scoring approach recommended by the Weikart Center described previously. In a similar fashion, the Palm Beach QIS has adopted a policy of publicly recognizing programs that have maintained a PBC-PQA total score of 4.1 or higher over two successive years as being

[4] Significant refers to $p < .10$.

of especially higher quality. In light of how PBC-PQA total scores have come to be used both in research studies and in supporting various aspects of QIS implementation and evaluation, steps were taken by the AIR research team to explore how programs assigned to lower and higher quality groups varied in terms of their mean PBC-PQA total score for the 2011–12 school year.

As shown in Table 7, there was a significant different in the mean PBC-PQA total score between programs in the lower and higher quality groups. Of particular interest was finding that the minimum score among programs in the higher quality group was 4.15, which is consistent with the threshold adopted by Prime Time in publicly recognizing programs for their level of quality; however, it is important to note that several programs exceeded the 4.1 threshold that (1) were assigned to both low and moderate quality cluster as shown in Figure 3 and (2) dropped from the higher quality group based on the goal to maximize the variation between lower and higher quality programs on the engagement scale and to prevent score overlap on the supportive environment and interactions scales.

To some extent, these differences are reflective of the differences between the common method of scoring the PBC-PQA and the use of Rasch approaches. The typical method gives more weight to subdomains and domains containing more items irrespective of the difficulty of the items in question. In this sense, there are potentially many paths to getting to a 4.1 on the instrument which may not reflect the achievement of a high level of performance on more difficult items that are indicative of higher levels of program functioning. This may serve to mask important differences in programs exceeding the 4.1 threshold in terms of the level of quality they have achieved relative the PBC-PQA construct.

Table 7. Comparison of Raw PBC-PQA Total Score by Lower and Higher Quality Groups

	Lower Quality (*n* = 19)	**Higher Quality (*n* = 19)**
Mean PBC-PQA Total Score (Range)*	3.68 (3.28 to 3.97)	4.59 (4.15 to 4.87)

*Indicates significantly different ($p < .001$).

Performance on the Form B PBC-PQA

In addition to observations conducted by Prime Time quality advisors using the PBC-PQA Form A, which examines quality at the point-of service, steps are also taken as part of the Prime Time QIS to assess how well the program has adopted organizational processes that are likely to support the implementation of quality programming at the point of service. The PBC-PQA Form B is used to conduct this assessment. Like the Form A, the Form B is made up a series of rubrics describing low, moderate, and high implementation of a given quality practice. Scores are assigned to each item appearing on Form B using the same 1, 3, 5 rating structure associated with Form A based on program director responses to an interview conducted by the Prime Time quality advisor. There are four main domains making up the PBC-PQA Form B:

1. Youth-centered policies and practices
2. High expectations for youth and staff
3. Organizational management
4. Family

In a fashion similar to the previous section, steps were taken to explore how programs assigned to the lower and higher quality groups scored differently on each of the four primary domains making up Form B. As shown in Table 8, the programs assigned to the higher quality group were found to have significantly higher scores on three of the four Form B domains than programs in the lower quality group. The only domain where mean scores were not found to be significantly different was in relation the *Youth-centered policies and practices* domain.

Table 8. Comparison of Raw PBC-PQA Form B Domain Scores by Lower and Higher Quality Groups

	Lower Quality (*n* = 19)	**Higher Quality (*n* = 19)**
Mean *Youth-centered policies and practices* (range)	4.36 (3.00 to 5.00)	4.59 (3.20 to 5.00)
Mean *High expectations for youth and staff* (range)*	4.64 (4.22 to 5.00)	4.88 (3.89 to 5.00)
Mean *Organizational management* (range)***	3.24 (2.57 to 3.90)	3.91 (3.29 to 4.57)
Mean *Family* (range)**	4.13 (2.67 to 5.00)	4.63 (4.00 to 5.00)

*Indicates significantly different at $p < .05$.

**Indicates significantly different at $p < .01$.

***Indicates significantly different at $p < .001$.

Staffing Stability

One of the key elements of the Palm Beach QIS are efforts to both support program directors in their efforts to cultivate the quality of their program and develop afterschool staff who design and deliver afterschool activities to participating youth through a variety of training and professional development opportunities. In light of this investment, it is hypothesized that the general working environment for afterschool staff will ultimately be a more supportive and edifying one for program staff as efforts are made to work through the quality improvement cycle enshrined in the QIS process. As a result, it is expected that the year-to-year retention of staff would be higher in higher quality programs. This hypothesis is tested in Table 9 where the proportion of staff retained between the 2010–11 and 2011–12 school years is examined for programs assigned to the lower and higher quality groups.

As shown in Table 9, whereas the rate of retention of staff was slightly higher in higher quality programs on average compared with program assigned to the lower quality group, it was not found to be significantly so. In light of this result, it may be appropriate for Prime Time to consider the adoption of some other, potentially more sensitive measures like afterschool staff satisfaction surveys to explore how program participation in the QIS and staff participation in related supports designed to enhance their development may impact staff's sense of attachment to the programs they work in.

Table 9. Comparison of Staffing Retention Levels by Lower and Higher Quality Groups

	Lower Quality (*n* = 19)	Higher Quality (*n* = 19)
Mean *Proportion of staff retained* (range)	.641 (.00 to 1.00)	.753 (.52 to 1.00)

Levels of Youth Attendance in Afterschool Programming

Consistent program participation over time is necessary for youth to reap the many benefits afterschool programs can produce in terms of positive youth outcomes. Previous work conducted by members of the evaluation team has also demonstrated the existence of a relationship between measures of program quality and levels of program attendance (Naftzger, Nistler, et al., 2013, Naftzger, Vinson, et al., 2013). In this section of the report, steps are taken to explore how youth enrollment in lower and higher quality programs was found to be related to two measures of program participation:

1. The number of days youth attended programming during the 2011–12 school year
2. The number of consecutive years youth were enrolled in a given program, with participation data available for 2009–10, 2010–11, and 2011–12

It is important to note that the afterschool system in Palm Beach County does not maintain a centrally based system for collecting afterschool attendance data on all youth attending afterschool programs in the county. However, attendance is tracked by Family Central for those youth whose families are receiving public child care subsidies to fund their enrollment in programs. Although no information is available regarding how these youth are likely to be different from the full domain of afterschool youth attending afterschool programs enrolled in the Palm Beach QIS, it is envisioned that these youth come from more economically disadvantaged households given their utilization of public child care subsidy programs.

During the span of the 2011–12 school year, child care subsidies were associated with a total of 1,332 youth who participated in one of the 38 afterschool programs represented in lower and higher quality groups being examined in this report. In terms of means days of program attendance, as shown in Table 10, no significant difference was found between membership in the lower and higher quality groups, with the average number of days attended largely equivalent across the two groups.

Table 10. Comparison of Mean Levels of Afterschool Program Attendance by Low and Higher Quality Groups

	Lower Quality (*n* = 662 youth attending 19 programs)	Higher Quality (*n* = 670 youth attending 19 programs)
Mean days of program attendance, 2011–12	129.31	132.49

However, a slightly different result was observed when the relationship between quality group membership was considered in relation to the number of consecutive years a youth had been

enrolled in a given afterschool program. As shown in Table 11, the proportion of youth participating in a higher quality program that had been enrolled in that program all three years was approximately 40 percent. In contrast, 32 percent of youth enrolled in lower quality programs participated in a given program in this group for all three years for which data were available. Although this was a significant difference (chi-square = 9.401, degrees of freedom (*df*) = 2, $p < .01$), the relative strength of this association was relatively weak (eta = .07).

Table 11. Levels of Program Attendance Across Multiple Years by Lower and Higher Quality Groups

	Lower Quality		Higher Quality	
Retention Status	***n***	**%**	***n***	**%**
Only participated in 2011–12	301	45.5%	279	41.6%
Participated in 2010–11 and 2011–12	150	22.7%	125	18.7%
Participated in 2009–10, 2010–11, and 2011–12	211	31.9%	266	39.7%
Total	662	100.0%	670	100.0%

In examining these findings, it important to note that almost all the students for which program attendance was available were in grades K–5, meaning that they likely had less choice in deciding to attend the afterschool program and that their families may have been using these programs primarily as afterschool child care for their children. In this sense, the selection of programs may have been driven more by program location and parents feeling comfortable that their children were in a safe, nurturing environment. In this content, parents may have been less attuned to some of higher order elements of youth program quality described in the interaction and engagement sections of the PBC-PQA that would have caused to them to gravitate toward higher quality programs in a way that would have shown up in the 2011–12 attendance data.

The fact that higher quality programs seemed to have retained students at a greater rate across years is promising and more consistent with the expected relationship between program quality and attendance-related outcomes.

Summary of Findings—Quality Profiles and Other Key Afterschool Measures

As noted previously, the purpose of exploring the relationship between membership in a higher or lower quality profile and key elements of QIS participation and afterschool operation was to ensure that there are meaningful differences between programs in the higher and lower quality groups on key elements likely to be correlated with levels of quality measured by the Form A PBC-PQA. If relationships were found to exist in the direction and strength hypothesized, then additional confidence could be had in the substantive difference between the higher and lower quality groups. In most, but not all cases, membership in the higher quality group was associated with higher levels of performance, including the following:

1. Across each of the three PBC-PQA domains, anywhere from 84 percent (in the case of supportive environment) to 100 percent (in the case of engagement) of programs in the

higher quality group witnessed significant improvement in scores compared with their first year of involvement in the QIS. By comparison, anywhere from 0 percent (in the case of supportive environment) to 37 percent (in the case of interaction) of programs in the lower quality group demonstrated significant improvement from baseline. Such results indicate that programs in the higher quality group had been on an upward trajectory in terms of improving program quality that was not observed with programs in the lower quality group.

2. The average raw total score on the PBC-PQA for programs in the higher quality group was 4.59 (ranging from 4.15 to 4.87). In contrast, the average for the lower quality group was 3.68 (ranging from 3.28 to 3.97). What is encouraging here is that programs in the higher quality group all exceeded the threshold defined by Prime Time for public recognition of higher quality programs, a threshold predicated on the observations of Prime Time quality advisors on what they felt characterized a high level of program functioning.
3. The average raw score on three of the four Form B PBC-PQA domains was higher for the higher quality group as opposed to programs in the lower quality group, suggesting that the programs in the higher quality group had more fully adopted organizational processes likely to engender the type of point-of-service quality measured by the PBC-PQA Form A.
4. Although the average rate of staff retention was found to be higher in the higher quality group (75 percent) compared with programs in the lower quality group (64 percent), this difference was not found to be statistically significant; however, the direction of the mean differences is in the direction hypothesized.
5. Although no significant differences were found in the number of days youth in the lower and higher quality groups attended afterschool programing in 2011–12, higher quality programs were found to retain a significantly higher percentage of youth in programming across the three years examined than programs in the lower quality group. Again, this finding is consistent with what would be hypothesized in this regard and provides some evidence that quality matters in terms of supporting long-term involvement in afterschool programming.

Generally, the process used to define higher and lower quality groups and the analyses summarized in this portion of the report suggest there is enough variation between the two groups in terms of the experiences had by youth participating in each type of program that we can reasonably hypothesize that there will be a difference in youth outcomes between the two groups. In the sections that follow, steps are taken to explore whether youth participation in a higher quality program has a greater impact on education-related outcomes compared with youth participation in lower quality programs.

Assessing the Impact of Participation in Higher Quality Programs on Youth Outcomes

As mentioned in the introduction to this report, the primary goal of this study was to answer one primary research question: *What impact does participation in higher quality afterschool programs have on youth outcomes compared with similar students participating in lower quality afterschool programs?*

As shown in the previous sections of the report, Prime Time had accumulated an extensive data set regarding afterschool program quality predicated on the criteria embedded in the PBC-PQA suite of tools, which allowed for the creation of fairly robust lower and higher quality profiles that appear to behave largely in the manner hypothesized. However, the infrastructure for tracking youth participation in afterschool programming and linking these data with information about how youth performed on a series of education-related outcomes proved more challenging for the AIR research team.

As mentioned previously, information about which youth participated in afterschool programming and at what levels of attendance was limited to those youth who had received public child care subsidies. Steps were taken by the Children's Services Council to provide this information to the School District of Palm Beach County who matched these records against district data warehouses to obtain school- and youth-level data from these students. This process resulted in data for 1,332 youth who attended afterschool programming at the 38 lower and higher quality programs enrolled in the QIS initiative during the 2011–12 school year. It is important to note that these programs likely served a greater number of students than the 1,332 identified. No information was available about the larger population of youth served by these programs.

However, some of the 1,332 youth identified as attending the 38 lower and higher quality programs had only attended afterschool programming for a few days during the 2011–12 school year. Past work conducted by the AIR evaluation team showed that a 30-day attendance threshold is really the minimum number of days that should be considered when attempting to assess the impact of afterschool programming on youth outcomes (Naftzger, Nistler, et al., 2013, Naftzger, Vinson, et al., 2013). Of the 1,332 youth represented in the data set, a total of 1,122 students were found to have participated in afterschool programming in 2011–12 for 30 days or more.

To examine the impact of attending a higher quality after school program, the research team compared outcomes of youth who attended the 19 highest quality afterschool programs in the district for at least 30 days during the 2011–12 school year with youth who attended lowest quality programs for at least 30 days. The School District of Palm Beach County provided the research team with sufficient data to examine the following youth outcomes:

1. Number of days absent from school
2. Whether a student was promoted on time to the next grade
3. Number of disciplinary referrals or incidences
4. Florida's Comprehensive Assessment Test (FCAT) results in reading and mathematics

In addition, the district provided data on student characteristics and outcomes prior to the 2011–12 school year, as well as data on the schools these students attended during the regular school day during the 2011–12 school year.

Analytic Approach

In any evaluation of a program where participants are not randomly assigned to treatment or control, the problem of selection is paramount. Youth who seek out participation in a higher quality afterschool program may differ from those who attend lower quality programs in a variety of ways. In addition, the school that a student attends is likely related to what afterschool program he or she attends and has a separate impact on the outcomes of interest. These differences can bias estimates of impact. If we were simply to compare youth who attend higher quality afterschool programs with those who attend lower quality programs, we would not be able to disentangle the effect of the program from the pre-existing difference between these two groups of youth or differences in the quality of schools they attend during the regular school day.

To address these potential confounders of estimating the effect of attending a higher quality afterschool program, the research team employed a propensity score stratification approach. Propensity score stratification is a statistical method that allows researchers to estimate more closely the causal effect of interest by creating a comparison group that looks like the treatment group on all observable characteristics. This approach has two main components. First, the research team used a propensity score stratification approach to construct a comparison group of youth who attended a lower quality afterschool program but were similar to students who attended a higher quality program on observable characteristics and attended similar schools. Then, the research team examined whether youth who attended higher quality programs outperformed youth in the matched comparison group on the outcomes of interest.

We began with pretreatment student and school characteristics for the students who attended the 19 highest quality centers and the 19 lowest quality centers in the district for at least 30 days. We limited our analyses initially to youth who had taken the FCAT in the 2010–11 school year and who had outcome data in the 2011–12 school year. Although this limited our analytic sample to students in Grades 4–7, this ensured that we were able to control for past academic achievement, an important predictor of student outcomes (Bifulco, 2012; Hallberg & Cook, In progress). Employing these criteria, the analytic sample included 361 students across both higher and lower quality centers. To create the comparison group, we calculated the propensity that each of these youth would attend a higher quality program based on the available observable characteristics. The outcome of interest in modeling propensity scores is treatment status (1 for attending a higher quality program and 0 for attending a lower quality program). To account for this binary outcome, logistic regression was used to model the logit (or log-odds) of student group assignment status. The propensity score was formulated as follows:

$$\text{logit}(Z_{ij}) = \alpha + \mathbf{X}'_{ij}\boldsymbol{\beta} + \boldsymbol{W}'_{\boldsymbol{j}}\boldsymbol{\beta}$$

where Z_{ij} indicates the treatment status for student i who attended school j (Z_{ij} = 1 for students who attended a higher quality program and Z_{ij} = 0 for students who attended a lower quality program) and a student's logit is a linear function of a vector of individual student characteristics, $\mathbf{X}'_{ij}$, and a vector of characteristics of the school the student attends, $\boldsymbol{W}'_{\boldsymbol{j}}$. The individual student characteristics included race/ethnicity, gender, special education status, limited English proficiency status, and prior year FCAT reading and mathematics scores. The school characteristics included the school's demographic makeup and the number of the school's

students who qualify for free or reduced-price lunch, the number who have limited English proficiency, the number who qualify for special education services, and the average school FCAT performance in reading and mathematics in 2010–11.

Once a propensity score was calculated for each student, we stratified the sample on the propensity score and calculated strata-specific treatment on the treated weights. This approach essentially forms a matched comparison group of youth who attended lower quality centers but are similar to youth who attended higher quality centers on all observable characteristics.

Given the nested structure of the data (students within both schools and afterschool centers), we then used a hierarchical modeling approach to examine the effect of attending a higher quality afterschool program on days absent from school, whether a student was promoted on time to the next grade, the number of disciplinary referrals or incidences, and FCAT results in reading and mathematics. The model was formulated as shown in the following for levels 1 and 2.

Level 1—Students:

$$y_{ij} = \pi_{0j} + \pi_{1j} Z_{ij} + \sum \pi_{pj} x_{ij} + e_{ij}$$

where Y_{ij} is the outcome for student i in school and center combination j, Z_{ij} is an indicator of whether student i in school and center combination j participated in a higher quality program, and x_{ij} is a vector of student level characteristics.[5]

Level 2—School and Center Combinations

$$\pi_{0j} = \beta_{00} + \sum \beta_{01} W_j + r_{0j}$$

$$\pi_{1j} = \beta_{10} + r_{1j}$$

$$\pi_{pj} = \beta_{p0}$$

where the intercept and treatment effect are modeled as random to account for institutional differences and all other covariates are modeled as fixed effects and W_j is a vector of school characteristics.

[5] Although the propensity score matching was the primary method for control differences between treatment and comparison students, covariates that either were not sufficiently balanced between treatment and control and covariates that are particularly important for theoretical reasons can be included as additional controls in the outcomes model, making the modeling approach "doubly robust."

Results

Table 12 provides a descriptive picture of students who attend higher and lower quality afterschool programs. Comparing the second and third columns, we can see that students who attend lower quality programs had lower reading and mathematics FCAT scores in 2010–11, had more absences and disciplinary referrals, and were more likely to receive special education services and be limited English proficient. In addition, they were more likely to attend schools that performed lower on the FCAT in 2010–11. From the final column, we see that the matched comparison group looked more like students who attended higher quality programs across the majority of these characteristics.

Table 12. Treatment and Comparison Group Characteristics

	Higher Quality	Lower Quality	Matched Comparison
Student-level characteristics			
Reading FCAT 2010–11	305.77	295.53	304.51
Mathematics FCAT 2010–11	330.21	313.04	324.03
Number of absences 2010–11	5.87	6.40	5.12
Number of disciplinary referrals 2010–11	0.32	0.40	0.29
Male	54.26%	52.56%	49.44%
Special education	11.17%	19.23%	15.51%
Limited English proficient	23.94%	32.05%	15.63%
School level-characteristics			
Average reading FCAT 2010–11	303.81	297.89	299.52
Average mathematics FCAT 2010–11	327.16	316.72	322.77
Percent retained in grade	2.44%	2.68%	2.48%
Percent suspended	9.12%	7.58%	9.13%
Percent Asian	2.09%	2.04%	2.37%
Percent Black	42.28%	34.34%	44.70%
Percent Hispanic	37.38%	48.34%	34.60%
Percent White	13.84%	12.80%	14.88%
Percent ESE	10.24%	11.08%	10.83%
Percent free lunch	75.92%	78.66%	74.20%
Percent reduced lunch	5.76%	5.95%	6.30%
Percent bilingual	8.98%	10.79%	10.56%

Table 13 displays the estimated effect of attending a higher quality afterschool program on the outcomes of interest. The nonacademic outcomes suggest a positive effect from attending a higher quality afterschool program. Students who attended higher quality programs in 2011–12

had fewer absences, were less likely to be retained, and had fewer behavioral incidences. However, this difference was only found to be statistically significant for the retention outcome, although this effect was found to be very small.

The data on FCAT achievement level offer less clear support for the hypothesis that attending a higher quality afterschool program improved student outcomes. Students who attended higher quality programs were less likely to score at or above grade level on the FCAT and this difference was statistically significant in mathematics. These results should be interpreted with caution, however. Because of a change in the FCAT in the 2011–12 school year student scale scores were not available to be used as an outcome in this analysis. Instead, the research team had to rely on the less precise achievement levels to examine the effect of the program on student achievement. These metrics are known to be imperfect in examining differences between groups because they are very sensitive to the distribution of student scores relative to the proficiency cut point. As a result, these scores can lead to incorrect or incomplete inferences (Ho, 2008).

Table 13. Estimate Effect of Attended a Higher Quality Afterschool Program

Outcome	Estimated Effect	Standard Error
Number of school day absences	-0.76	0.77
Retention in grade	-0.06**	0.02
Number of disciplinary referrals	-0.22	0.19
Reading FCAT 2011–12 achievement level	-0.06	0.05
Mathematics FCAT 2012–12 achievement level	-0.16**	0.06

* Indicates statistically significant at $p = .10$ level.

** Indicates statistically significant at $p = .05$ level.

In light of the fact that inclusion of FCAT scores served to reduce the size of the sample and the absence of scale scores for the 2011–12 school year, steps were also taken by the research team to rerun the impact analyses excluding FCAT results, either as pretreatment covariates or youth outcomes, employing the propensity score stratification described previously. This step served to increase the overall number of youth who could be included in impact analyses. Because this was the case, a decision was made by the research team to examine the impact of participating in a higher quality program based on 60 days of program attendance, as opposed to the 30-day attendance threshold employed when conducting the analyses summarized in Table 12. In statewide evaluation work of the 21st CCLC program conducted by members of the research team, greater program effects have been consistently found at the 60-day, as opposed to 30-day, participation level. These changes resulted in a sample size consisting of 1,001 youth attending the 38 higher and lower quality programs under consideration. Similar to Table 12, Table 14 provides a summary of youth attending higher and lower quality programs represented in the expanded sample.

As shown in Table 14, youth attending lower quality programs were more likely to receive special education services and be limited English proficient. In addition, they were more likely to attend schools in which a higher proportion of Hispanic youth make up the student body and where the percentage of youth eligible for free lunches was higher.

The final column summarizes the characteristics of the matched comparison group, which were more like those attending higher quality programs across the majority of these characteristics.

Table 14. Treatment and Comparison Group Characteristics—Expanded Sample

	Higher Quality	Lower Quality	Matched Comparison
Student-level characteristics			
Number of absences 2010–11	6.23	5.98	5.48
Number of disciplinary referrals 2010–11	0.31	0.33	0.30
Male	53.77%	53.92%	54.06%
Special education	12.50%	15.09%	12.71%
Limited English proficient	20.04%	28.77%	16.81%
School-level characteristics			
Percent retained in grade	2.54%	2.65%	2.72%
Percent suspended	8.04%	7.12%	7.52%
Percent Asian	2.14%	1.91%	2.33%
Percent Black	41.07%	36.21%	42.24%
Percent Hispanic	36.65%	45.87%	35.59%
Percent White	16.08%	13.48%	16.56%
Percent ESE	10.11%	11.18%	10.11%
Percent free lunch	73.82%	78.07%	74.20%
Percent reduced lunch	5.91%	5.99%	6.35%
Percent bilingual	9.54%	11.05%	11.99%

As shown in Table 15, despite the larger sample size, the estimated effects of 60 days of participation in higher quality programming largely mirror those when 30 days of participation was considered and FCAT scores were considered as covariates. Here again, youth who attended higher quality programs in 2011–12 had fewer absences, were less likely to be retained, and had fewer behavioral incidences; however, this difference was only found to be statistically significant for the retention outcome. Again, the effect here was found to be small.

Table 15. Estimate Effect of Attending a Higher Quality Afterschool Program—Expanded Sample

Outcome	Estimated Effect	Standard Error
Number of school day absences	-0.10	0.74
Retention in grade	-0.09**	0.03
Number of disciplinary referrals	-0.11	0.26

* Indicates statistically significant at $p = .10$ level.

** Indicates statistically significant at $p = .05$ level.

Correlational Analyses

Previous studies exploring the relationship between multiple years of participation in afterschool programming and youth outcomes have demonstrated that two or more years of cumulative participation in programing are typically associated with greater effects (Fredricks & Eccles, 2006; Huang et al., 2007; Russell et al., 2006). To explore the role multiple years of participation in higher quality programming on youth outcomes, youth participating in higher quality programming for 30 days or more in both 2010–11 and 2011–12 were identified, as were youth meeting similar criteria but that attended the lower quality programs. A total of 698 youth meeting these criteria were identified from the 38 higher and lower quality programs under consideration.

An initial effort was undertaken to explore the impact of participating regularly in higher quality for two cumulative years using a propensity score stratification approach akin to those described in the previous section; however, this approach proved not to be viable given a lack of overlap on key characteristics between youth attending two years of programming in the higher quality programs and youth meeting similar criteria in the lower quality programs.

In light of this, the research team opted to modify the analysis to a correlational one (as opposed to a causal one) using multilevel regression approaches. In this case, the relationship between enrollment in a higher quality program and youth outcomes can be assessed, but it is not possible to say that enrollment in a higher quality program definitively caused a given outcome. Key youth- and school-level characteristics were included in the multilevel models. These are summarized in Table 16, with breakouts provided for youth attending higher and lower quality programs. As shown in Table 16, there were notable differences on variables related to whether youth were enrolled in school-based programs, limited English proficiency, and the percentage of the school population with a Hispanic ethnicity between the higher quality and lower quality programs.

Table 16. Treatment and Comparison Group Characteristics—Correlational Analysis

	Higher Quality	Lower Quality
Student-level characteristics		
Attend school-based program	27.9%	64.90%
Number of absences 2009–10	5.83	5.00
Number of disciplinary referrals 2009–10	0.26	0.33
Male	52.37%	54.87%
Special education	13.37%	17.11%
Limited English proficient	21.72%	31.56%
School-level characteristics		
Percent retained in grade	3.14%	3.02%
Percent suspended	8.91%	8.17%
Percent Asian	2.28%	1.79%
Percent Black	43.91%	38.14%

	Higher Quality	Lower Quality
Percent Hispanic	34.58%	45.17%
Percent White	15.02%	12.43%
Percent ESE	10.33%	12.00%
Percent free lunch	71.11%	76.42%
Percent reduced lunch	4.98%	4.69%
Percent bilingual	9.43%	11.01%

Table 17 summarizes the estimate effects of attending a higher quality afterschool program regularly for two cumulative years relative to attending a lower quality program. As shown in Table 17, the retention rate and number of disciplinary referrals were found to be slightly lower in the higher quality programs, while the number of school-day absences was slightly higher in the higher quality programs. Like previous analyses, the only significant effect was found to be associated with the retention outcome, with youth in higher quality programs demonstrating a lower likelihood of being retained. Here again, the observed effect was small.

Table 17. Estimate Effect of Attending a Higher Quality Afterschool Program—Correlational Analysis

Outcome	Estimated Effect	Standard Error
Number of school day absences	0.06	0.67
Retention in grade	-0.09*	0.02
Number of disciplinary referrals	-0.21	0.19

* Indicates statistically significant at $p = .10$ level.

** Indicates statistically significant at $p = .05$ level.

Summary of Findings—Student Outcomes Analysis

The impact analyses undertaken in this report represent one of the first studies to assign afterschool programs carefully to lower and higher quality profiles and assess how membership in a higher quality profile impacts education-related outcomes. Part of the innovation here is using a quasi-experimental design that allows for causal inferences to be drawn about the relationship between higher quality programming and youth outcomes. The analyses conducted provide preliminary evidence that attending a higher quality program can have a positive effect for students. Students who attended higher quality programs in 2011–12 had fewer absences, were less likely to be retained, and had fewer behavioral incidences. However, only the finding related to the retention outcome was statistically significant for the retention outcome. This finding was replicated in each of the analyses undertaken as part of the study. The results were less positive for the effect of attending a higher quality program on student achievement as measured by the FCAT. However, because the analyses were limited to examining the effect of attendance on proficiency status and were based on very small sample sizes, these results should be interpreted with caution.

Inevitably, this study has limitations. The analyses were limited to a relatively small number of students who attended either a higher or lower quality program in the 2011–12 school year and whose families had received child care subsidies during this period. This small sample limits the statistical power of the study to detect effects. In addition, it limits the generalizability of study findings to students in Grades 1–7 who have been in the district at least two years. As in any study where random assignment to treatment and control conditions is not feasible, it is possible that there were unobservable differences between students who attended higher quality and lower quality programs that we were unable to control for. To the extent that unobserved differences are related to student outcomes, these differences could bias the estimated treatment effects. Despite these limitations, we believe this study provides important preliminary evidence on the effect of attending a higher quality after school program on student outcomes.

Conclusions

As mentioned in the introduction to this report, the primary goal of this study was to answer one primary research question: *What impact does participation in higher quality afterschool programs have on youth outcomes compared with similar students participating in lower quality afterschool programs?*

To answer this question, steps were taken by the AIR research team to construct lower and higher quality profiles systematically based primarily on Form A PBC-PQA data collected by Prime Time quality advisor over a five year period. Nineteen programs were assigned to both the lower and higher quality groups (38 afterschool programs in total), and membership in these groups was found to be related to the following aspects of afterschool operation in the manner hypothesized:

- Changes in Form A PBC-PQA scores over time, with higher quality programs demonstrating significant improvement on the PBC-PQA from their first year of enrollment in the Palm Beach QIS.
- Raw scores on the PBC-PQA with higher quality programs exceeding the target threshold established by Prime Time for the public recognition of higher quality programs.
- Performance on three of the four domains making up the Form B PBC-PQA, with programs assigned to the higher quality group receiving higher scores.
- Levels of youth retention in programming across multiple programming years, with youth participating in higher quality programs more likely to continue enrollment in those programs over time.

When examining the relationship between membership in a lower or higher quality group and youth outcomes, it was hypothesized that youth in the higher quality group would have

- Fewer school-day absences
- A lower level of grade retention
- Fewer disciplinary referrals
- Higher levels of FCAT reading and mathematics performance

The results from the impact analyses undertaken to answer the research questions demonstrated that youth who attended higher quality programs in 2011–12 had fewer absences, were less likely to be retained, and had fewer behavioral incidences than youth attending programs assigned to the lower quality group, although these difference were only statistically significant for the retention outcome. It is important to note, however, that sample sizes were very small, thereby reducing the power to detect significant effects.

In addition, attending higher quality programs was only significantly and negatively associated with FCAT mathematics performance; however, because the analyses were limited to examining the effect of attendance on proficiency status, these results should be interpreted with caution. In addition, school-based programs were heavily represented in the lower quality group, and it may the case that this facilitated the alignment of afterschool programming with school-day content in

a way that supported the achievement of desirable academic outcomes. There is certainly additional exploration that needs to be done in this area to further explore this finding.

In terms of next steps, it is recommended that the Palm Beach QIS seriously explore adopting a centralized attendance tracking system to allow for the identification of the full domain of youth served by programs enrolled in the QIS. This would allow for the impact models described in this report to be rerun with a larger and more representative sample size, enhancing the likelihood of being able to detect effects related to the positive impact of higher quality programming and ensuring the results are more generalizable to the school-age population in Palm Beach County. The preliminary findings outlined in this report suggest there is a possibility of significant positive effects in these areas that warrant the continuation of research efforts in relation to these outcomes.

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Appendix A. Description of Psychometric Analyses to Assess and Refine PBC-PQA Functioning

The purpose of this appendix is outline the domain of psychometric analyses undertaken to assess how well the PBC-PQA was functioning from a measurement perspective and to make modifications to the creation of PBC-PQA scores that resulted in the most valid and meaningful data possible given the goals of the study. Each of the following sections are dedicated to a different facet of measurement, describing both what analyses were done and how the results from these analyses were used to modify and refine the PBC-PQA score creation process.

Bias Introduced by the Type of Activity Observed

In this section, steps are taken to describe how MFRM (Linacre & Wright, 2004) was employed to explore the relationship between activity type and PBC-PQA scores. In prepping the PBC-PQA data sets for submission to the AIR research team, staff from Prime Time were asked to classify each activity observed into one the following categories.[6]

1. *Homework help:* Homework help refers to program time that is dedicated explicitly to assisting students work independently on homework, with or without assistance from staff, volunteers, or older peers.
2. *Tutoring:* These activities involve the direct provision of assistance to students in order to facilitate the acquisition of skills and knowledge related to concepts addressed during the school day. Tutors or teachers work directly with students individually and/or in small groups to complete their homework, prepare for tests, and work specifically on developing an understanding and mastery of concepts covered during the school day.
3. *Academic enrichment learning programs:* Academic enrichment activities expand on students' learning in ways that likely differ from the methods used during the school day, with an emphasis on hands-on, experiential, and inquiry-based learning approaches. They are characterized by an intentional embedding of academic content into activities, including literacy, mathematics, science, and social studies. They often are interactive and project focused. They enhance a student's education by bringing new concepts to light or by using old concepts in new ways. These activities are meant to be fun for the student, but they also impart knowledge. They allow the participants to apply knowledge and skills stressed in school to real-life experiences.
4. *Nonacademic enrichment learning programs:* Like academic enrichment activities, nonacademic enrichment activities also expand on students' learning in ways that likely differ from the methods used during the school day, with an emphasis on hands-on, experiential, and inquiry-based learning approaches but are not overtly academic in nature. They often are also interactive, project focused, and meant to be fun for the

[6] It is important to note that the assigning of activity codes to observed activities represented in the PBC-PQA data set occurred well after these observation were conducted and were based on the names given to activities and brief descriptions of their content. In this sense, we expect some level of misclassification to have occurred. However, the issue activity bias was deemed to be an important concern warranting exploration despite the imperfect activity type classification process.

student. Examples of activities that would fall within this category would include arts and crafts, dance, music, and other types of activities that fall outside core academic areas.

5. *Recreational activities:* These activities are not academic in nature, but rather allow students time to relax or play. Sports, games, and clubs fall into this category. Occasional academic aspects of recreation activities can be pointed out, but the primary lessons learned in recreational activities are in the areas of social skills, teamwork, leadership, competition, and discipline.
6. *Group instruction:* These activities largely mirror typical school-day classroom instruction with the adult facilitator or teacher spending the bulk of the activity teaching a lesson with an explicit academic focus. Unlike academic enrichment, these activities tend be characterized more by rote instruction, and students are largely placed in a passive role relative to the instructor.

Based on the information available about each activity that was observed during the five-year period, approximately 80 percent of the 1,239 activities represented in the Prime Time PBC-PQA data set could be assigned one of these six activity codes. As shown in Table A1, the bulk of observed fell within one of three primary categories: (1) academic enrichment learning programs, (2) nonacademic enrichment learning programs, and (3) recreational activities.

Table A1. Number and Percentage of PBC-PQA Scored Afterschool Activities by Activity Type

Activity Type	Number of Observed Activities With Activity Codes	Percentage of Activities With Activity Codes
Homework help	71	7.1%
Tutoring	3	0.3%
Academic enrichment learning programs	333	33.1%
Nonacademic enrichment learning programs	317	31.5%
Recreational activities	271	26.9%
Group instruction	12	1.2%
Total	1,007	100.0%

Past work conducted by members of the AIR evaluation team has suggested these six activity types can be further be collapsed into three primary groupings (Naftzger, Nistler, et al., 2013; Naftzger, Vinson, et al., 2013):

1. *Overt academic,* comprised of activities initially classified as homework help, tutoring, and group instruction
2. *Enrichment,* comprised of activities initially coded as either academic enrichment or non-academic enrichment learning programs
3. *Recreation,* which was made up solely of activities initially coded as recreational activities

MFRM analyses were then employed to answer the following question: Are overt academic, enrichment, and recreational activities equivalent in terms of how well they are likely to score on the YQPA? The goal in answering this question was to identify whether the activity type was systematically related to the PBC-PQA total score, with some activity types garnering a lower score relative to other activity types on average. If this was found to be the case, then the score a given program received on the PBC-PQA could be influenced or biased by the type of activity observed, either making the program look better or worse depending on the type of activity.

In terms of results, a significant difference was found to exist between *enrichment* activities which scored systematically higher and *recreational* and *overt academic* activities, which scored systemically lower (chi-square = 510.6; $df = 3$; $p < .001$). In this sense, the type of activity observed did bias the PBC-PQA score. These findings were consistent with what had been seen by members of the research team in previous studies. The MFRM process accounted for this bias by adjusting *enrichment* scores down slightly and the scores for *recreational* and *overt academic* activities up slightly.

However, while significant differences were found and adjusted for using MFRM approaches, the overall impact on scores taking into consideration the whole sample was relatively small. For example, the adjusted PBC-PQA total scores derived from MFRM were very highly correlated with both the raw total PBC-PQA score using the scoring approach recommended by the Weikart Center ($r = .93$) and the PBC-PQA total score derived from a Rasch dichotomous model not controlling for activity type ($r = .98$). Given the strong correlation between (1) estimates derived from MFRM and the Rasch dichotomous model and (2) the loss in data that would be associated with controlling for activity type because only 80 percent of observed sessions had a valid activity type code, the overall impact on quality estimates was considered benign enough to proceed with the calibration of quality estimates not accounting for activity type to support the construction of higher and lower quality profile types.

Yet, there was evidence that not controlling for activity type could have substantive impacts for *individual* within-year estimates for a given afterschool program. For example, using the raw PBC-PQA total score employing the methods recommended by the Weikart Center, one Palm Beach program rated 334th out of 469 annual quality estimates in terms of total PBC-PQA quality. After adjusting for activity type, they went to 129th out of 469, a difference of more than 200 spots in the rankings. Prime Time should consider adopting procedures either to ensure the same types of activities are observed across programs or adopt a method for adjusting PBC-PQA scores if PBC-PQA results will be used to rank or otherwise recognize programs publicly for high levels of quality. Failing to do so will likely lead to some programs being treated unfairly in the recognition process.

Need for a Dichotomous Rating Scale

Rasch approaches also yield information about how well the rating scale associated with a given measure like the PBC-PQA is functioning from a psychometric perspective. Not all rating scales are created equal, and a poor functioning rating scale can serve to decrease the reliability of a measure.

To explain how Rasch analysis techniques assess how well a rating scale is functioning, we first need to think about the continuum of quality practice as measured by the PBC-PQA as a sort of "ruler." Some length of that ruler is going to represent what a *1* level of practice looks like (low implementation of a given practice), another segment should be associated with a *3* level of performance (moderate implementation), and the final segment should represent what constitutes a *5* level of performance (high implementation).

What Rasch techniques do is formally quantify how much of that ruler represents a *1* level of performance, how much of the ruler represents a *3* level of performance, and how much of the ruler represents a *5* level of performance. Typically, ordinal response options (i.e., the 1, 3, and 5 used to score the PBC-PQA) akin to those found on the PBC-PQA are assumed to cover an *equal portion* of the "quality ruler" (basically splitting the quality ruler into thirds). However, when conducting Rasch analyses, the *actual width* of the quality ruler covered by a *1*, *3*, or *5* rating is empirically calculated based on how raters used the rating scale for the bank of items appearing on a given domain of the tool. Rarely are the ranges of performance represented by the rating scale options equivalent as is assumed in the typical way PBC-PQA scores are calculated. The more the ranges of performance differ from the assumption that they are equally spaced across the quality ruler, the larger the negative impact on the scores being derived from the tool.

In addition, there are guidelines regarding how much of the "ruler" a given response option should cover in order for the scale to be a viable. For a three response option scale like the PBC-PQA, the distance covered by a given response options should be a minimum of 1.4 logits[7] (Linacre, 2004). In the MFRM models that were run exploring the impact of activity type on quality scores, the distance covered between response categories was a mere 0.24 logits, suggesting a three point rating scale for the PBC-PQA data set was not viable. Here again, this finding is consistent with other studies we have conducted with PBC-PQA data (Naftzger, Nistler, et al., 2013; Naftzger, Vinson, et al., 2013).

To address this issue and thereby improve the reliability of the quality estimates derived from scoring the PBC-PQA, 1 and 3 scores were collapsed into one category (0), whereas a score a 5 was recoded to a value of 1. In this sense, each item score on the PBC-PQA was transformed in to a yes/no format—either the activity received a 5 on the item or they did not. This approach to scoring the PBC-PQA was used in the remainder of the analyses highlighted in this report.

Refining the PBC-PQA Scales to Address Issues of Reliability and Unidimensionality

Whereas PBC-PQA total scores are commonly used to make a summative determination of the level of quality demonstrated by a given afterschool program, the AIR research team opted to consider scores at the domain level (i.e., *safety*, *supportive environment*, *interaction*, and *engagement*) when building quality profiles. This was done given the assumption that important differences across PBC-PQA domains would emerge in relation to the 108 programs represented in the study that otherwise would be masked by solely examining the PBC-PQA total score. The

[7] Logits are the units associated with the single, linear interval scale that results from running Rasch models, which put both quality estimates and item difficulty estimates on the same continuum, allowing them to be directly compared.

AIR research team wanted the capacity to capitalize on these differences when constructing the quality profiles to maximize the variation between lower and higher quality groups.

With the decision made not to adjust PBC-PQA scores to account for the type of activity observed, the decision was made to use a simpler Rasch model to calibrate scores for each of the four PBC-PQA domains. The Winsteps (Linacre, 2009) computer program was used to obtain quality scores and item difficulty estimates for each of the four PBC-PQA domains using the Rasch dichotomous model (Wright & Masters, 1982). It is important to note the quality scores resulting from these analyses were at the individual *activity* level (n = 1,239 across the five years for which data were available). The intent of the AIR research team was to take the mean of the scores for a given year on each of the four domains to create an *annual quality estimate* for a given program.

However, when steps were taken to create domain-level quality scores using the Rasch dichotomous model, a number of problems were identified, both in terms of score reliability and the assumption of unidimensionality (i.e., the assumption that the items making up a given PBC-PQA domain were measuring a single underlying construct). Three statistics resulting from the calibrations in Winsteps were used to identify these issues.

1. *Cronbach's alpha:* A measure of reliability bounded by zero and one and is reflective of the average interitem correlation among item responses. Generally, an alpha value of .60 is considered minimally acceptable.
2. *Rasch separability index:* Similar to interpretation to Cronbach's alpha but also indicates the spread of the quality estimates for a given domain. The higher the index value, the more spread out activities were on the domain being measure. Given the goal of creating quality profiles that distinguish higher from lower quality programs, the concept of being able to separate effectively one program from another in terms of quality was critical to the study. Here again, a value of .60 is considered minimally acceptable.
3. *Eigenvalue after first contrast:* To assess whether the assumption of unidimensionality has been met, Winsteps conducts a principal component analysis of the standardized residuals resulting from the Rasch scaling of PBC-PQA data, which allows for confirmation of the absence of a second major factor (the possible existence of a second factor would indicate the items in a given domain are measuring more than one construct). Generally, eigenvalues less than 2 in relation to the unexplained variance after the first contrast are indicative of a single factor underpinning the items associated with a given domain of the PBC-PQA. Values greater than 2 may suggest the presence of a second factor.

As shown in Table A2, the initial calibrations conducted in Winsteps resulted in acceptable levels of reliability based on Cronbach's Alpha, with all values greater than .60. However, both safety and engagement were below .60 on the Rasch Separability Index, indicating a lack of separation of quality scores among the activities represented in the data set (see shaded cells). The issue of separability was particularly issue with the safety domain, where 78 percent of activities received the maximum score on this scale resulting in a substantial ceiling effect. A similar issue was found to characterize the engagement scale, although the issue here was one of floor effects where over 12 percent of activities received the lowest score possible.

Although the supportive environment scale performed well in terms of Cronbach's alpha and the Rasch separability index, there were substantive signs of a second factor underpinning the items represented on the scale given the high eigenvalue (see shaded cell).

Table A2. Scale Functioning by PBC-PQA Domain—Initial and Revised Calibrations

	Initial Calibrations			Revised Calibrations		
PBC-PQA Domain	**Cronbach's Alpha**	**Rasch Separability Index**	**Eigenvalue After First Contrast**	**Cronbach's Alpha**	**Rasch Separability Index**	**Eigenvalue After First Contrast**
Safety	.71	.00	1.6	—	—	—
Supportive Environment	.93	.70	3.0	.76	.69	1.6
Interaction	.67	.68	2.0	.64	.60	1.8
Engagement	.73	.57	1.8	.72	.66	1.7

In light of these results, the AIR research team decided some modifications to the scales making up the PBC-PQA were warranted to improve the separability index for engagement and address the problems with dimensionality in relation to supportive environment. Given how pervasive the ceiling effects were in relation to the safety scale, no fix was readily available, and it was decided that this scale should be dropped from efforts to develop quality profiles. There was simply not enough variation in the scores on this scale to be useful in distinguishing between lower and higher quality programs.

To enhance the functioning of the supportive environment and engagement scales, the following steps were taken:

1. *Supportive environment:* Steps were taken to try to split the supportive environment scale into two subscales based on results from the principal component analysis. However, reliability levels were found to be viable for only one of these subscales, so the other newly created subscale was dropped.
2. *Engagement:* To improve the separability index for engagement, some items were moved from the interaction scale to the engagement scale. As shown in Table 3, the eigenvalue for interaction was exactly 2.0, right on the boundary of what is considered acceptable. Items found on the *Youth have opportunities to act as group facilitators and mentors* (III-O) subdomain of the interaction scale, however, were found to load better on the engagement scale and were therefore moved.

With these changes, all three indicators of psychometric functioning outlined in Table 3 moved into the acceptable range (see columns associated with the "Revised Calibrations" heading). Items retained for the construction of quality profiles were associated with the following PBC-PQA subdomains and scales:

a. Revised *supportive environment* scale
    - Activities support active engagement.
    - Staff support youth in building new skills.
    - Staff support youth with encouragement.
b. Revised *interaction* scale
    - Youth have opportunities to develop a sense of belonging.
    - Youth have opportunities to participate in small groups.
    - Youth have opportunities to partner with adults.
    - Youth have opportunities to develop positive peer relationships.
c. Revised *engagement* scale
    - Youth have opportunities to act as group facilitators and mentors.
    - Youth have opportunities to set goals and make plans.
    - Youth have opportunities make choices based on their interests.
    - Youth have opportunities to reflect.

In addition, reaching this point was not the end of the AIR team's attempts to maximize the reliability of quality estimates on the supportive environment, interaction, and engagement domains. Further steps needed to be taken in this process to account for differences between the baseline level of performance associated with a program's first year of involvement with the QIS and subsequent years. Ultimately, steps needed to be taken to use MFRM to treat each activity-level PBC-PQA score as an estimate of annual program quality to achieve desirable levels of reliability for both baseline and follow-up scores for a given program.

In this sense, steps were taken to calibrate *baseline* levels of performance based on an afterschool program's first year of involvement in the QIS and then *anchor* PBC-PQA scores from subsequent years (i.e., years 2–5) to the item difficulty estimates associated with the baseline year. This is a common practice when analyzing scores using a Rasch analysis approach. The idea here is that over time, some items appearing on an instrument like the PBC-PQA will get easier for programs as they improve. This was especially important to control for in this study because the QIS programs were participating in was specifically designed to support improvement in the adoption of practices and approaches detailed in the PBC-PQA. The process of calibrating baseline score first and then calibrating scores from subsequent years while anchoring item difficulty estimates to baseline levels helps to ensure important changes between baseline and subsequent years can be detected.

However, when just baseline data was analyzed using the Rasch dichotomous model in Winsteps, separatability index estimates for the contracted interaction scale and the expanded

engagement scale were below desirable levels (.55 and .45, respectively). In this regard, it did not seem possible to obtain *activity-level* quality estimates using baseline data only and achieve the desirable level of reliability from a Rasch perspective.

In light of this outcome, steps were taken to again use MFRM to calibrate quality estimates for both baseline and follow-up scores (i.e., years 2–5 for a given program), this time not controlling for activity type. For these analyses, what was being estimated was the *program's* annual quality rating based on the three observations conducted within a given year. Because the object of measurement now had three scored ratings (program level) as opposed to just one rating (activity level), reliability—as measured by the Rasch separability index—was improved as shown in Table A3. Quality estimates derived from MFRM using the items from the 11 subdomains identified in the previous section served as the basis for the construction of quality profiles detailed more fully in the sections that follow.

Table A3. MFRM-Derived Reliability Estimates by Domain—Year 1 Relative to Years 2–5[8]

	Rasch Separability Index	
PBC-PQA Domain	**Baseline (Year 1)**	**Years 2–5**
Supportive environment: reduced	.73	.83
Interaction: reduced	.71	.77
Engagement: expanded	.71	.85

[8] Baseline (year 1) refers to the first year a given program was enrolled in the QIS. Years 2–5 refer to the subsequent years a given program was participated in QIS activities.

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