



South Carolina First Steps to School Readiness Parents as Teachers External Evaluation FY16-17 to FY18-19

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EXECUTIVE SUMMARY

South Carolina First Steps to School Readiness (SCFS) was created by legislation in 1999 to lead the state's efforts in supporting school readiness for young children. SCFS is both a state agency and a non-profit organization, consisting of a state-level office and a network of 46 county-based Local Partnership offices. Supporting school readiness is a complex undertaking that requires a range of approaches, as multiple factors at the individual, family, and community levels affect the ability of children to benefit from educational opportunities. In recognition of the critical role of parenting in child development, parenting and family support programs represent one of the most significant categories of expenditure for SCFS Local Partnership offices. Parents As Teachers is the most common parenting program delivered or supported by SCFS (used by 27 of 46 Local Partnerships) and represents the largest fiscal investment in parenting programs by SCFS. In light of this significant investment, SCFS is legislatively required to evaluate prevalent programs on a five-year schedule (SC State Code § 59-152-50). The current evaluation of PAT was conducted to meet this legislative requirement.

The current evaluation of PAT was designed to examine program reach and impacts on key factors related to school success using quantitative data from FY16-17 through FY18-19. The time frame selected excludes FY19-20, the fiscal year during which the COVID-19 pandemic disrupted services and fundamentally altered life and services world-wide. This evaluation builds upon a prior external evaluation of PAT for SCFS by COMPASS that used data from FY08-09 to FY15-16. This prior evaluation focused on the establishment and implementation of PAT services within SCFS and determined that the program was being implemented according to both National PAT as well as SCFS program requirements. The prior evaluation also examined the impact of PAT services on both child and adult (parenting) outcomes; parenting outcomes showed some improvement over time while child outcome findings were mixed. Specifically, small differences were seen on a measure of school readiness (CIRCLE) between children who received PAT as compared to a large sample of children in public school who did not receive PAT, and no differences were seen between these groups in later grade retention. The current evaluation builds on this work by focusing exclusively on outcomes of PAT services at the child and parent level, using similar measures but with a more targeted comparison group of children that was created using propensity score matching, a statistical approach used to create comparison groups who are similar to the target group of children. For this report, children were selected for the comparison group based on their similarity to children whose families received PAT services in terms of geographic location (county), poverty level, race, and gender. Children were not able to be matched on all known risk factors relevant for poor educational outcomes, as these data are not available in the archival data sets used for this evaluation.

During the time frame of the evaluation, PAT reached 2,602 children and families primarily through 61,969 home visits. Families served experienced a variety of risk factors related to early school failure, as is required for eligibility for PAT services delivered or supported by SCFS. Among the 21 key risk factors for early school failure that SCFS considers for PAT program eligibility for children and families, the most frequently experienced risk factors for PAT program participants during the evaluation period were: Eligibility for the Supplemental Nutrition Assistance Program (SNAP) or free school lunches (86.9% of participants), belonging to a single-parent household (64.9% of participants), eligibility for TANF based on having income at or below 50% of the federal poverty level (54.5% of participants), maternal education

lower than high school graduation (27.8% of participants), and having a teenaged custodial parent (15.4% of participants). Importantly, when averaged across all participants, children of adults who participated in the PAT program during the evaluation period had an average of 3.4 risk factors ($SD = 1.7$). This suggests that children served by PAT in this evaluation sample are experiencing a substantial number of risk factors for poor educational outcomes.

With regard to PAT program delivery, the average length of enrollment was 1.7 years, which suggests good congruence with the PAT Essential Requirements for PAT Affiliates of at least two years of services (see Appendix A). The primary program component received by families was home visits; families received an average of 17.9 home visits per fiscal year, which approaches the PAT program goal of 24 home visits per family per fiscal year. Note that this annual average includes families who were enrolled for only a part of the fiscal year, so it may not represent the high level of support PAT families received. Perhaps a more accurate representation of home visit support is the average count of home visits monthly, as this monthly average is not impacted by families who enrolled for only part of a fiscal year. Families received an average of 2.3 home visits per month, well above the minimal threshold of 1.8 visits listed in the PAT program standards. Families participated far less in parenting group services (aka Group Connections); 17.7% of parents attended at least one group meeting, and about three-quarters of those parents who attended at least one group meeting ultimately attended 3 or less total group meetings.

PAT services also include developmental screening. The tools used for these screenings are two versions of the Ages and Stages Questionnaire, the ASQ-3 and the ASQ:SE. The ASQ-3 assesses five skill areas: communication, gross motor, fine motor, problem solving, and personal-social. Social-emotional screening using the ASQ:SE, or a more recent version, ASQ:SE-2, examines self-regulation, compliance, communication, adaptive behaviors, autonomy, affect, and interaction with people. In total, 6,131 ASQ-3 assessments and 4,974 ASQ:SE or ASQ:SE-2 assessments were included in the evaluation data. Importantly, the majority of ASQ-3 assessment results showed that children were on track for typical development, with 86.9% to 91.8% of all ASQ-3 assessments resulting in "on track" status across the various developmental domains. The majority of ASQ:SE/ASQ:SE-2 assessment results showed that between 82.1% and 86.1% of assessments showed children to be "on track" with regard to the development of social-emotional and behavioral skills. Thus, 8-18% of screenings suggested some level of developmental and/or social-emotional delays; this early identification of potential delays fortunately allows for referrals to be made for more comprehensive evaluation.

Data regarding the number of children identified by the screening tool as having developmental delays is somewhat consistent with data from the SC Department of Education, which showed that 11.2% of 5-year-olds who had received PAT were classified as receiving special education services in kindergarten (representing approximately 1% of children receiving special education services during FY17-FY19). As the ASQ measures are screening tools, it is possible that the number of children identified with potential delays is larger than the number of children who are experiencing delays to the degree that special education services are warranted.

A core focus of this evaluation was to examine the impact of PAT services on important proximal indicators of school readiness, including parenting and the parent-child relationship. PAT is a program

that focuses on parents as agents of change; thus, changes in parenting are particularly important program outcomes. Importantly, and consistent with the prior external evaluation of PAT impact, positive changes were seen over time in program recipients. Specifically, the quality of the parent-child relationship increased as the length of enrollment increased as measured by the Keys to Interactive Parenting Scale (KIPS), an observational assessment. Using a second observational measure, the Adult-Child Interactive Reading Inventory or ACIRI, positive changes were seen over time on parent-child joint reading/interactive reading skills. Specifically, the average score across families increased substantially from families' first ACIRI score under PAT enrollment to their final ACIRI score under PAT enrollment. ACIRI scores also increased as enrollment increased. In other words, scores on these important indicators of parenting skill increased as enrollment increased (a dose-response effect). While we cannot say with absolute certainty that the PAT program services caused these positive changes (as we were unable to examine these measures in a comparison group of non-PAT families), the likelihood of both measures changing in a similar direction and the positive association of both measures with the length of PAT enrollment means that it is unlikely that these observed changes happened by chance.

The impact of PAT services was also examined with regard to indicators of school performance and behavior. Kindergarten Readiness Assessment (KRA) scores were examined by readiness level (i.e., emerging, approaching, and demonstrating readiness) for children who received PAT and for a matched comparison group of similar peers who did not receive PAT. Of note, the PAT intervention group sample size was considerably smaller than the number of matched comparison group peers, so percentages should be interpreted with caution. Results were available only for FY18 and FY19, as the KRA was not utilized in FY17. The percentage of PAT program students demonstrating readiness (27.4%) was similar to that of peers in the comparison group (28.5%). No differences in average KRA performance scores were seen between children who received PAT and similar (matched) peers, suggesting that children who live in families with a significant number of known risk factors associated with early school failure who received PAT are performing similarly to children who were matched by race/ethnicity age, gender, county, and poverty level (but who are experiencing an unknown number of risk factors for early school failure). While average school absenteeism was significantly reduced for children who received PAT as compared to same age peers, the level of chronic absenteeism (i.e., the percentage of students who missed more than 10% of the total school days for which they were enrolled) was not significantly different.

PAT service impact on rates of child maltreatment was also examined, as child maltreatment prevention is an important goal of PAT services. Data from the SC Department of Social Services was analyzed to address this question and the rates of founded child maltreatment cases were similar among children who received PAT as compared to similar peers who did not receive PAT.

Child health and well-being was the final area of interest in this evaluation, given the importance of health to child development and school success. Importantly, using Medicaid data, the evaluation found that children who received PAT services attended a significantly higher percentage of the recommended number of well-child visits as compared to similar peers who did not receive PAT.

In sum, the evaluation identified strengths in PAT program delivery by SCFS PAT-trained parent educators, including high rates of home visitation services and average enrollment approaching two years.

Participation in group parenting meetings was less common. The current evaluation identified positive change in important proximal factors related to school success, namely parenting skills (as assessed by two different measures) over the course of PAT enrollment. A dose-response effect was seen, in that increased time of enrollment was associated with higher scores on these parenting measures. Additionally, children/families who received PAT services participated in significantly more well-child visits as compared to a group of similar children who did not. While differences were not seen on KRA performance between children who received PAT services and similar peers who did not, the current evaluation did not examine the potential for changes in school performance or behavior later in elementary school. Importantly, the children receiving PAT are experiencing a significant number of known risk factors for poor educational outcomes whereas the number and type of risk factors experienced by the comparison group could not be examined due to data limitations.

Evaluation Limitations

As with all evaluation approaches, the current evaluation is not without limitations. The quantitative data selected for inclusion in this evaluation were truncated due to concerns about data gathered in the fiscal years impacted by the COVID-19 pandemic; thus, sample sizes were smaller than would ideally have been used for analyses, due to the more limited number of years included in this evaluation (i.e., three fiscal years), as compared to the previous evaluation (i.e., eight fiscal years of data). While regular evaluations that span shorter time periods represent a highly valuable approach that has potential to impact the usefulness of evaluation results (e.g., ability to more regularly apply findings to program practices), the shorter time span also introduces limitations worth noting (e.g., smaller sample size).

While most analyses relied on sample sizes that were large enough to facilitate confidence in the accuracy and generalizability of findings, one result of the limited years of data selected for this evaluation was that some analyses performed had especially small sample sizes. Specifically, the analyses performed regarding the impact of PAT services on KRA performance contained a sample of 215 children out of the 2,602 children served by PAT in the evaluation period. These 215 children were the only children served by PAT in the evaluation time frame who appeared in the KRA data set obtained from the SC Department of Education (via RFA). The majority of the 2,602 children served by PAT in the evaluation sample were well below age 5, and thus had not yet reached kindergarten. Additionally, the KRA was not given in FY17, so data were available only for FY18 and FY19, further limiting sample sizes. Another impact of small sample sizes was that some analyses were unable to be conducted in the planned manner. For example, while absenteeism data were requested for all three fiscal years included in the evaluation, the evaluation team received multiple years of absenteeism data for only 86 children in the PAT program intervention group. The research team thus determined that the sample size was too small for a rigorous longitudinal analysis, as was planned during evaluation scoping.

With regard to the analytic approach, during analyses of child outcomes, we compared children exposed to PAT services to a propensity score matched comparison sample whenever possible. However, children in the comparison sample were able to be matched based only on location (county), gender, race, poverty status, and age. These indicators, while important and relevant, do not represent the full spectrum of risk factor data available for children from PAT-enrolled families, as the PAT program collects much more detailed data than is available in the state-level data systems from which the comparison group was

drawn. Children served by PAT during the evaluation period experienced a substantial number of risk factors predictive of poor educational outcomes, including living in a single parent household, maternal educational attainment, and having a teenage custodial parent. Thus, the propensity score matched sample was adequate but did not include additional risk factors present in the PAT sample that are known to impact educational outcomes. While this methodology created a strong comparison group for evaluation purposes, it may be that children in the comparison group experienced fewer other risk factors and were thus unequal to the comparison group in unidentifiable ways.

In addition to these limitations, there were a number of challenges with the data request process and the timeliness of data provided to the authors of this evaluation report.

- ◆ Several of the research questions included in the evaluation scope of work focus on the relationship between variables that exist at the child level and those that exist only at the parent or family level. Importantly, identifiers in the data set for specific children (“RFA ID number”) are unable to be consistently linked to identifiers that exist only at the parent or family level (“Case ID number”). Thus, it was difficult or impossible to address a number of evaluation questions as there was no way to consistently link the child-specific data generated by RFA using the RFA ID number to the parent/family within which each child lived (as specified by a case ID number in the SCFS PAT data).
- ◆ Several data requests took place with RFA before receiving the correct sample of PAT program participants for analysis for this evaluation. There was confusion around the program codes that should be used to identify those families involved in the PAT program and as a result, the correct data files were not received until October 15, 2021. For future PAT program data requests, we suggest a kick-off meeting between the research team and RFA to review the data requests in order to ensure that the appropriate variables and sample are delivered. We believe some of the data errors experienced in this study could have been avoided by additional dialogue between the research team and RFA and less reliance on email exchanges. See Appendix C for additional information regarding parent and child level data files.
- ◆ PAT program data were limited by the fact that the PAT codebook does not have value labels recorded for many of the key variables of interest. This was a barrier for researchers when it came to understanding and analyzing the data and required additional efforts to request value labels for each individual variable contained in data requests.

Conclusions

The current evaluation extends findings from a prior external evaluation of PAT for First Steps by using a quantitative approach to assessing program impact on parent and child outcomes in important areas related to school success. Similar to the prior evaluation, the current evaluation finds that the program is reaching children and families who are at high risk for poor educational outcomes (averaging more than three risk factors of the twenty-one identified by SCFS). While many children and families experience risk factors for poor educational outcomes, it is the accumulation of risk factors that is of concern—the more risk factors seen, the higher the likelihood of a poor educational outcome, especially as the number of risk factors exceeds three or more.

With regard to receipt of PAT services, the majority of families served are enrolling in PAT services when children are at an early age, with 84.5% of the current sample enrolling when children are age two and younger. Furthermore, the average length of service is 1.7 years, approaching the PAT standard of two years. Families received an average of 2.3 home visits per month, exceeding the expected standard of 2 visits per month. On average, families are receiving 17.9 home visits per year, which may be an underestimate as this annual average includes families who were enrolled for only part of a fiscal year. Overall, visitation data suggests that that trained PAT home visitors are able to support and guide families at a high level of intensity during a most critical period of child development.

Among families served by PAT, and consistent with the prior external evaluation of PAT for First Steps, the current evaluation found positive changes over time on parenting factors important to healthy child development and school success—the quality of the parent-child relationship and parent-child interactive reading skills—which increased as length of program involvement increased. Children are also receiving important developmental screenings; the vast majority of children were found to be “on track” developmentally. External referrals are being made for additional services at a high rate.

While this evaluation did not identify significant differences between children served by PAT and a matched sample of like peers on the KRA, the limited sample size of children in the PAT group for this analysis precluded our ability to reach a firm conclusion regarding impact of PAT services on kindergarten readiness (See Appendix D). Importantly, this finding is somewhat consistent with the prior external evaluation of PAT on a different measure of school readiness (CIRCLE), in which only small differences were noted between children who received PAT and children who did not. Extant peer-reviewed research on PAT has identified significant impact of PAT services on later academic achievement and school behavior¹; however, there are no published studies of PAT impact on measures of school readiness that can be used as a comparison for the results of this evaluation.

In addition to examining measures of school readiness like the KRA, it is also important to examine other factors that can impact a child’s academic performance such as attendance. The current evaluation showed that the average percentage of days absent for a PAT program student was significantly lower than the average percentage of days absent for students in the comparison group. Finding lower rates of absence is consistent with prior research¹ and is an important finding, as attending school is a prerequisite for being able to perform well in school. That said, no differences were seen in rates of chronic absenteeism (i.e., missing 10% or more of total days enrolled in school) between children who received PAT and like peers.

Extending analysis of PAT program impact, the current evaluation examined the impact of PAT services on well child visits, an important indicator of child health and well-being. Children who received PAT services did participate in well child visits at a higher rate than similar children who did not; this higher level of

¹ Lahti, M., Evans, C. B. R., Goodman, G., Schmidt, M. C., & LeCroy, C. W. (2019). Parents as Teachers (PAT) home-visiting intervention: A path to improved academic outcomes, school behavior, and parenting skills. *Children and Youth Services Review, 99*, 451–460. <https://doi.org/10.1016/j.childyouth.2019.01.022>

participation in well-child services affords the opportunity for preventive healthcare and early identification of factors that can negatively impact child health, well-being, and school success. This is a novel finding, as to our knowledge, there are no prior published studies that examined PAT impact on well child visits.

Lastly, with regard to involvement in child protective services, no differences were seen between children served by PAT and similar peers with regard to the number of reports of child maltreatment either made or substantiated. Importantly, children who received PAT services have a trained parent educator conducting home visits for a substantial amount of time and attended a greater percentage of recommended well-child visits. Thus, families receiving PAT are under a higher degree of external surveillance relative to like peers, which provides more opportunities for maltreatment to be identified and reported. In this context, the finding of no difference between groups is noteworthy. Lastly, one prior study of PAT in Connecticut using a sample of first-time mothers also found no differences in regard to reports of child maltreatment but did find reduced rates of substantiated child maltreatment cases when comparing families receiving PAT to similar families who did not receive PAT². It is possible that differences in the samples between the current evaluation (i.e., not limited to first-time mothers) and this prior work may be one reason why the findings of this evaluation are different with regard to substantiated child maltreatment cases.

Recommendations

In light of evaluation findings, we offer these recommendations for practice by First Steps and recommendations to support future research efforts.

Recommendations for First Steps

1. To support future evaluations of the impact of PAT, it is recommended that the data captured for this program include both a family/adult-level identifier as well as a child-level identifier for every case in all relevant data sets. In this manner, future analyses can both link adult/family data with child data for all outcome areas. Furthermore, this can support more sophisticated multi-level analyses accounting for the nesting of children within families.
2. Provision of PAT services by First Steps is predicated upon identification of a target child within a family. As many families served have more than one child, it is recommended that all children associated with a family are identified in the data system. In this manner, generalization of program impact can be assessed for specific outcomes at the child level.
3. Evaluating the impact of PAT services on kindergarten readiness using the KRA as an outcome measure should be performed using a larger sample of children than was possible in the current evaluation time frame.
4. It is recommended that consistent, standardized details regarding referrals made by PAT home visitors be captured in the data system. Specific details including reasons for referral (i.e. whether

² Chaiyachati, B. H., Gaither, J. R., Hughes, M., Foley-Schain, K., & Leventhal, J. M. (2018). Preventing child maltreatment: Examination of an established statewide home-visiting program. *Child Abuse & Neglect*, 79, 476-484. <https://doi.org/10.1016/j.chiabu.2018.02.019>

the referral was made as a result of an identified developmental delay or for other reasons), and the outcome of those referrals, can be useful for both practice with families as well as for program evaluation.

5. It is recommended that a detailed codebook be created for PAT program data that includes value labels recorded for key variables of interest. A detailed codebook would enhance clarity and ease interpretation of data elements captured for the PAT program and would support future program evaluations.
6. Given that the majority of families participated in relatively few group meetings that are offered as part of PAT, it is important to examine barriers to participation in these services by families.
7. First Steps has established strong internal standards for PAT service delivery that are consistent with the National PAT program standards. It is recommended that implementation data continue to be collected regarding the timing, content, and length of program delivery to assure ongoing adherence to these high standards. Additionally, further consideration of how enrollment (and unenrollment, following the end of services) dates are tracked is recommended, as enrollment data were particularly complex, with many cases of separate but overlapping enrollment time periods within a family.

Recommendations to Support Future Research

1. Further research is recommended to assess impacts of PAT services on academic performance later in elementary school, in addition to assessing impact in kindergarten using the KRA.
2. A number of protective factors relevant for child maltreatment prevention are targeted by PAT, including knowledge of child development, social support, and concrete supports. Assessment of changes in protective factors may be informative to enhance understanding of the impact of PAT services. Thus, it is recommended that measurement of protective factors using a valid and reliable tool be considered for use as a way to assess program impact in areas related to child maltreatment prevention.
3. Future research efforts are needed to expand upon this evaluation's assessment of the impact of PAT services on the quality of the parent-child relationship and on parent-child interactive reading skills. Data measuring these factors were available only for PAT families, but not for a comparison group of like peers, as measures (i.e., KIPS and ACIRI) were administered as part of PAT services. However, additional research using a comparison group would facilitate the ability to attribute the positive change seen on these measures to PAT program services specifically.
4. As the quality of the relationship between the trained PAT home visitor and the family is an important factor for program success, future research efforts may benefit from inclusion of a valid and reliable measure of the working alliance between providers and families.
5. Assessing impact of a program like PAT entails use of data outside of the specific program data collected by First Steps. Within South Carolina, the Revenue and Fiscal Affairs Office collects data across many state agencies where impact can be detected including social services, health services, and educational services, and oversees the process of application for and provision of this data to researchers. The research team experienced a number of barriers to obtaining the correct data to support this evaluation. Thus, it is recommended that direct meetings occur between RFA and researchers at the inception of research/evaluation projects, and that detailed

written project plans, with a timeline, are mutually established to assure on-time delivery of accurate data for analysis.

INTRODUCTION

South Carolina First Steps to School Readiness (SCFS) was created by legislation in 1999 to lead the state's efforts in supporting school readiness for young children. Supporting school readiness is a complex undertaking that requires a range of approaches, as multiple factors at the individual, family, and community levels affect the ability of children to benefit from educational opportunities.

SCFS is both a state agency and a non-profit organization, consisting of a state-level office and a network of 46 county-based Local Partnership offices. Through this structure, investments are made at both the state and county level in services and supports designed to enhance school readiness for children ages 0-5. SCFS investments target focal areas known to be related to youth educational outcomes; presently these include health, parenting, early care and education, school transition, and SCFS 4K. Of these, parenting represents the most proximal influence on infant and child health, development, and well-being, providing the foundation for school readiness.

In recognition of the critical role of parenting in child development, parenting and family support programs represent one of the most significant categories of expenditure for SCFS Local Partnership offices. SCFS Local Partnerships at present support (either directly or indirectly) a variety of parenting programs, including Nurse-Family Partnership, Healthy Families America, HIPPY, Incredible Years, Triple P Positive Parenting Program, Strengthening Families, and Parents as Teachers. Of these, Parents as Teachers (PAT) is the most common parenting program delivered or supported by SCFS. PAT is used by 27 of 46 Local Partnerships and represents the largest fiscal investment in parenting programs by SCFS.

Legislatively, "prevalent programs" are defined as those that represent >10% of the total expenditure of Local Partnership formula funding. Thus, Parents as Teachers is a "prevalent program" by this definition. In light of this significant investment, SCFS is legislatively required to evaluate prevalent programs on a five-year schedule (SC State Code § 59-152-50). The legislation dictates that SCFS shall:

Contract with an external evaluator to develop a schedule for an in-depth and independent performance audit designed to measure the success of each prevalent program in regard to its success in supporting the goals of the State Board and those set forth in Section 59-152-20 and Section 59-152-30. Results of all external performance audits must be published in the SCFS annual report.

Thus, as required by legislation, the current evaluation focuses on SCFS's most prevalent parenting program, Parents as Teachers (PAT). PAT as implemented by First Steps local partnerships was also the subject of an evaluation published in 2017 by COMPASS Evaluation and Research, Inc. The COMPASS evaluation of PAT examined the implementation and short-term impact of PAT using information and data from 2008-2016. The current evaluation is designed to expand information on program reach and impacts specifically, using quantitative data from fiscal year 2016-2017 (FY17) through fiscal year 2018-2019 (FY19). Importantly, the time period for this evaluation of the PAT program excludes FY20, the fiscal year during which the COVID-19 pandemic disrupted services and fundamentally altered life and services world-wide.

What is the Parents as Teachers (PAT) Program?

PAT is a parent education program for expectant parents and parents of children ages birth to five (i.e., through kindergarten). PAT is designed to impact a variety of factors that can ultimately enhance school readiness, including parent knowledge of child development, identification of developmental delays and health problems, and prevention of child maltreatment.³

PAT is delivered by home visitors (PAT Affiliates) trained in the PAT Foundational Curriculum (for expectant parents through parents of children up to age 3) and/or the Foundational 2 Curriculum (for parents of children ages 3-kindergarten). PAT program services include personal visits to families, group connections, child developmental screening, and resource referrals, and program enrollment is ideally two years. Longer-term enrollment is desired to increase the potential impact of the program on important parent and child outcomes. Specifically, the PAT program aims to improve parenting knowledge and skills, identify infant/child developmental delays as early as possible, prevent child maltreatment, and to enhance children's school readiness, as indicated in the logic model for PAT (See Appendix B). SCFS has created PAT-specific program standards to align with and to support fidelity of local program delivery to the national PAT model¹.

Since the COMPASS evaluation of PAT was published in 2017, the empirical evidence base for PAT has grown substantially. Consistent with the multi-component nature of PAT, the evidence base for PAT includes qualitative studies detailing factors related to program implementation, highlighting the importance of the home visitor-parent relationship for low-income African American mothers⁴, as well as quantitative studies. Quantitative findings include positive impact on factors related specifically to school readiness, including parent involvement in school and home learning activities⁵; improved academic outcomes, school behavior, and parenting skills⁶; and maternal factors related to program impact on language development⁷. Consistent with PAT program goals, studies have also found impact on child maltreatment prevention, including a lowered risk of substantiated child maltreatment cases for families receiving PAT as compared to those who did not⁸, and a lower likelihood of future child-protective services reports for child protective services-involved families⁹. The growth of the evidence base for PAT has resulted in recognition of PAT at the national level as "evidence-based", meeting the U.S. Department of Health and Human Services criteria for "an evidence-based early childhood home visiting service

³ <https://parentsasteachers.org/evidencebased-home-visiting-model#aboutebm>.

⁴ Woolfolk, T. N., & Unger, D. G. (2009). Relationships between low-income African American mothers and their home visitors: A Parents as Teachers program. *Family Relations*, 58(2), 188–200.

⁵ Albritton, S., Klotz, J., & Roberson, T. (2003). *Parents as Teachers: Advancing parent involvement in a child's education*. <https://eric.ed.gov/?id=ED482696>

⁶ Lahti, M., Evans, C. B. R., Goodman, G., Schmidt, M. C., & LeCroy, C. W. (2019). Parents as Teachers (PAT) home-visiting intervention: A path to improved academic outcomes, school behavior, and parenting skills. *Children and Youth Services Review*, 99, 451–460. <https://doi.org/10.1016/j.chilyouth.2019.01.022>

⁷ Neuhauser, A., Ramseier, E., Schaub, S., Burkhardt, S. C. A., & Lanfranchi, A. (2018). Mediating role of maternal sensitivity: Enhancing language development in at-risk families. *Infant Mental Health Journal*, 39(5), 522–536. <https://doi.org/10.1002/imhj.21738>

⁸ Chaiyachati, B. H., Gaither, J. R., Hughes, M., Foley-Schain, K., & Leventhal, J. M. (2018). Preventing child maltreatment: Examination of an established statewide home-visiting program. *Child Abuse & Neglect*, 79, 476–484. <https://doi.org/10.1016/j.chiabu.2018.02.019>

⁹ Jonson-Reid, M., Drake, B., Constantino, J. N., Tandon, M., Pons, L., Kohl, P., Roesch, S., Wideman, E., Dunnigan, A., & Auslander, W. (2018). A randomized trial of home visitation for CPS-involved families: The moderating impact of maternal depression and CPS history. *Child Maltreatment*, 23(3), 281–293. <https://doi.org/10.1177/1077559517751671>

delivery model”¹⁰. PAT is also rated as well-supported (the highest rating possible) by the Title IV-E Prevention Services Clearinghouse (<https://preventionservices.abtsites.com/>). These ratings allow expenditure of specific federal funds to support implementation of PAT at the state level.

METHODOLOGY

Data Request Methodology

To gain access to PAT program data for this evaluation, Pacific Research and Evaluation (PRE) requested a data dictionary of all available program data and used the scope of work to identify which variables aligned with each of the key research questions. In addition to PAT program data, PRE also reviewed codebooks for the South Carolina Department of Education, the Department of Social Services, and Medicaid in order to request the appropriate data for relevant research questions. The data requests were completed by PRE in April of 2021 and sent to the South Carolina Revenue and Fiscal Affairs Office.

A PAT cohort was created for this evaluation that included families who participated in the PAT program between July of 2016 and June of 2019, covering fiscal year 2016-2017 (FY17) to fiscal year 2018-2019 (FY19). Selection criteria for the PAT cohort (referred to as the “treatment group”) included youth who were ages birth to 5 years from July 2016 to June 2019.

For this evaluation, to allow comparisons to occur, two “control groups” were created using propensity score matching conducted by the Revenue and Fiscal Affairs Office (RFA)—a technique used to match children from the treatment group to their most similar non-PAT peers within the State of South Carolina. Simple Random Sampling (SRS) was done using SAS using Proc SurveySelect. The first control group consisted of youth who were turning 5 by September 1 of FY17, FY18, or FY19. This control group was based on Medicaid and Department of Education data and matched on county, age, gender, poverty, and reported race/ethnicity of the child. The second control group consisted of youth under 5 as of September 1 of FY17, FY18, or FY19. This group was based on Medicaid data only and matched on county, age, gender, poverty, and reported race/ethnicity of the child. Children missing any data on county, age, gender, race/ethnicity were excluded from matching. To ensure a robust sample that accounted for minority classes/groups, oversampling was done as close to three times the treatment sample wherever possible. The first control group was requested to ensure sufficient data were available for Department of Education variables, but in general was too small for use in analyses. Matched analyses (i.e., those analyses comparing the treatment group to a matched comparison group) thus focus on the second control group.

Additional methodology details for the specific analyses used to answer each of the research questions are included throughout the findings section below. Specific measures included to answer each research question are described in detail within each section.

Terminology

Throughout this report, the terms *adult*, *parent*, and *caretaker* are used to reference the parent or guardian receiving PAT program services. *Child* refers to those individuals whose parents or guardians are

¹⁰ <https://homvee.acf.hhs.gov/about-us/hhs-criteria>

receiving PAT services. *Families* refer to both the child and parent/guardian, which is particularly important because a significant amount of the PAT program data was available only at the family level.

Limitations

There were significant limitations with the data request process and the data received to author this evaluation report. These limitations are documented here to support future research efforts by SCFS regarding the PAT program.

- ◆ Several of the research questions included in the evaluation scope of work focus on the relationship between variables that exist at the child level and those that exist only at the parent or family level. Importantly, identifiers in the data set for specific children (“RFA ID number”) are unable to be consistently linked to identifiers that exist only at the parent or family level (“Case ID number”). Thus, it was difficult or impossible to address a number of evaluation questions as there was no way to consistently link the child-specific data generated by RFA using the RFA ID number to the parent/family within which each child lived (as specified by a case ID number in the SCFS PAT data). See Appendix C for detailed information regarding data files at the parent and child level.
- ◆ Several data requests took place with RFA before receiving the correct sample of PAT program participants for analysis for this evaluation. There was confusion around the program codes that should be used to identify those families involved in the PAT program and as a result, the correct data files were not received until October 15, 2021. For future PAT program data requests, we suggest a kick-off meeting between the research team and RFA to review the data requests in order to ensure that the appropriate variables and sample are delivered. We believe some of the data errors experienced in this study could have been avoided by additional dialogue between the research team and RFA and less reliance on email exchanges.
- ◆ PAT program data were limited by the fact that the PAT codebook does not have value labels recorded for many of the key variables of interest. This was a barrier for researchers when it came to understanding and analyzing the data and required additional efforts to request value labels for each individual variable contained in data requests.



FINDINGS

The current evaluation was designed to examine both the reach of PAT services through SCFS and to evaluate the impact of PAT services on children and families. Specific research questions are listed below.



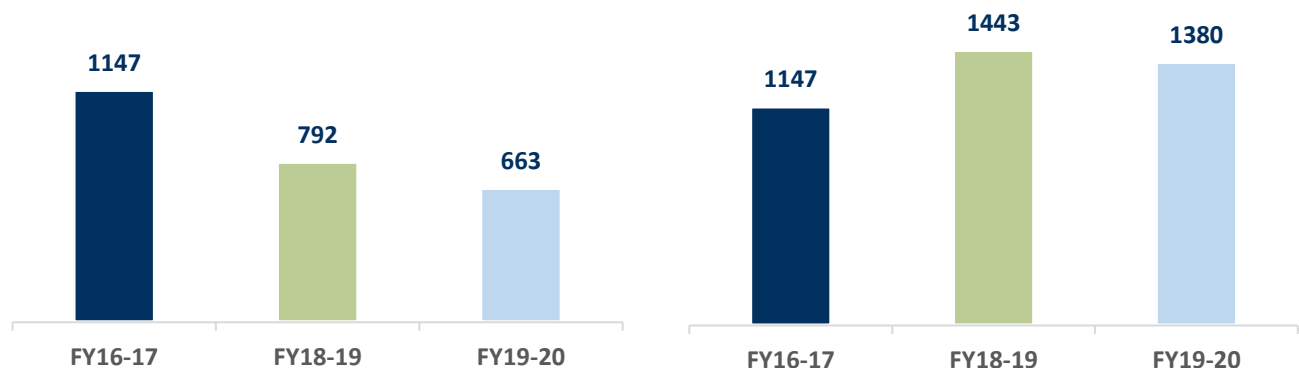
POPULATION OF CHILDREN AND FAMILIES SERVED

What population of children and families did PAT serve through local partnerships between FY17 and FY19?

1. How many children and families were served between FY17 and FY19?

The PAT program served a total of 2,150 adults from FY17 to FY19. While most adults focused PAT services toward a single child, other adults participated in PAT services with more than one child, resulting in a total of 2,602 children served between FY17 and FY19. Of the 2,150 total adults who participated, 345 adults participated with two children, 43 adults participated with three children, and 7 adults participated with four children. Figure 1 shows the distribution of children served across the three fiscal years included in the evaluation period in two ways: (left) with children counted only for the first fiscal year in which they were served within the evaluation period; and (right) the total number of children served each year including those children who received services multiple years.

Figure 1. Children Served by Fiscal Year (N = 2,602)



2. What are the key characteristics of the children and families served?

Within the evaluation timeframe, many children and families had data spanning more than one fiscal year. This is expected, as PAT is designed to serve children and families over time; SCFS Accountability Standards, consistent with national PAT model guidelines, strive to serve families for at least two full years. Thus, when children were represented in the data for more than one year, information from the earliest year within the evaluation period was selected for inclusion in the demographic breakdowns for this report.

Of the 2,602 children served in the evaluation period, 47.7% (n = 1,241) were female and 52.3% (n = 1,361) were male. Figure 2 displays reported child race. A total of 66.6% of children served were reported as Black/African American (n = 1,733), while an additional 32.0% of children served were reported as

White/Caucasian (n = 832). A total of 1.3% of children served were reported as Asian (n = 33), and less than 1.0% of children served were reported as Indian/Native American or Polynesian. A total of 13.1% (n = 341) of children were reported as Hispanic. Children ranged in age at enrollment from prenatal to five years old, as shown in Figure 3. The exact number of expectant mothers could not be determined because the data provided did not present age in values less than zero. Importantly, SCFS PAT Accountability Standards require that at least 70% of the newly enrolled families have an expectant mother and/or a child under 36 months of age. SCFS appears to be exceeding this standard; indeed, 84.5% of enrolled families contain expectant mothers and/or children less than 36 months of age.

Of the adults (parents/caretakers) served in the evaluation period whose demographic data were shared with the research team (n = 2,148), 96.2% (n = 2,067) were female and 3.8% (n = 81) were male. As shown in Figure 2 and similar to children served, a total of **66.7% of adults served were reported as Black/African American (n = 1,432), while an additional 31.8% of adults served were reported as White/Caucasian (n = 684).** A small percentage of adults served were reported as Asian (1.3%, n = 28), Indian/Native American (less than 1.0%), and Polynesian (less than 0.1%). A total of 12.4% (n = 266) of adults were reported as Hispanic. The adults served ranged in age at enrollment from 12 to 77 years old, as shown in Table 1. A total of 242 participants (11.2%) who were included as parents/caretakers were ages 12 to 20, representing a significant portion served who were adolescents or emerging adults themselves. This is important, as having a teenage mother is considered one of the risk factors for early school failure that is targeted in SCFS eligibility criteria for the PAT program.

Figure 2. Race of Children (N = 2,602) and Adults (N = 2,148) Served from FY17 to FY19

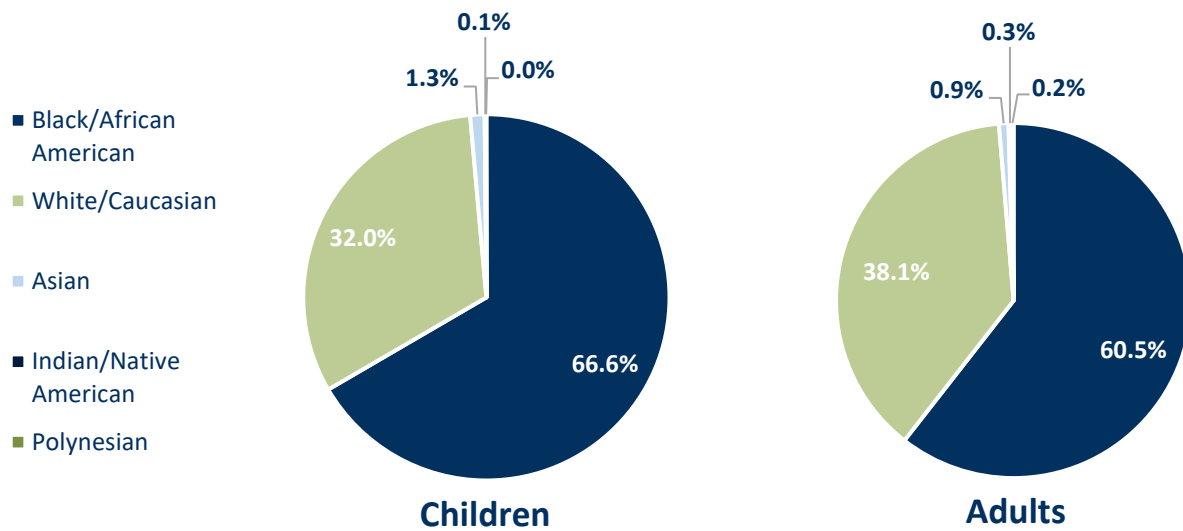
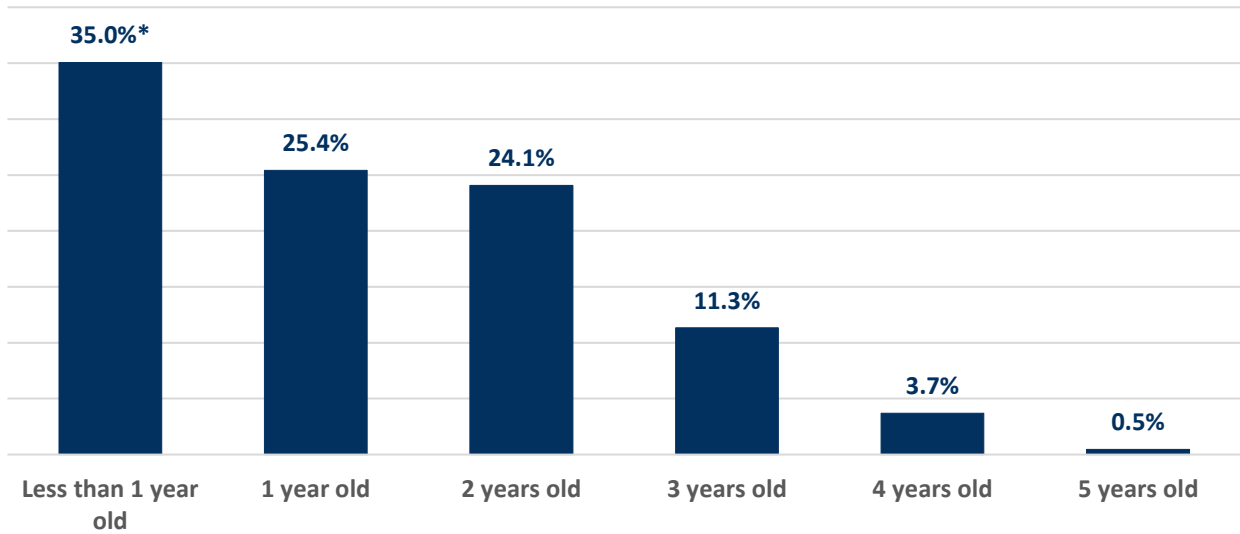


Figure 3. Age at Enrollment of Children Served from FY17 to FY19 (N = 2,602)



*Prenatal cases are included in this category, but the exact number of expectant mothers could not be determined because the data provided did not present age in values less than zero

Table 1. Age at Enrollment of Adults Served from FY17 to FY19 (N = 2,146)

| Age Group | Count | Percent |
|----------------------|-------|---------|
| 12 to 17 years old | 87 | 4.1% |
| 18 to 22 years old | 341 | 15.9% |
| 23 to 27 years old | 664 | 30.1% |
| 28 to 32 years old | 492 | 22.9% |
| 33 to 37 years old | 304 | 14.2% |
| 38 to 42 years old | 134 | 6.2% |
| 43 to 47 years old | 44 | 2.1% |
| 48 to 52 years old | 30 | 1.4% |
| 53 to 57 years old | 17 | 0.8% |
| 58 to 62 years old | 18 | 0.8% |
| 63 to 67 years old | 10 | 0.5% |
| 68 or more years old | 5 | 0.2% |

For those participants with household size data available, household size ranged from 1 (e.g., single mothers before giving birth) to 10 people, with the majority of households containing 3-4 people, as shown in Figure 4. The average household size was 3.6 ($SD = 1.3$). Single parent households are a risk factor for early school failure as noted in the SCFS PAT Accountability Standards and are discussed in more detail in the next section.

Children being raised in poverty also represent a population that may be at risk for early school failure as noted in the SCFS PAT Accountability Standards. For FY17-FY19, the majority of PAT services provided were for families in poverty. **Total family income was less than \$10,000 for 64.3% (n = 1,305) of families**

enrolled, and was less than \$20,000 for 89.2% of families enrolled. Total family income is displayed in Figure 5.

Figure 4. Average Household Size of Families Served from FY17 to FY19 (N = 1,669)

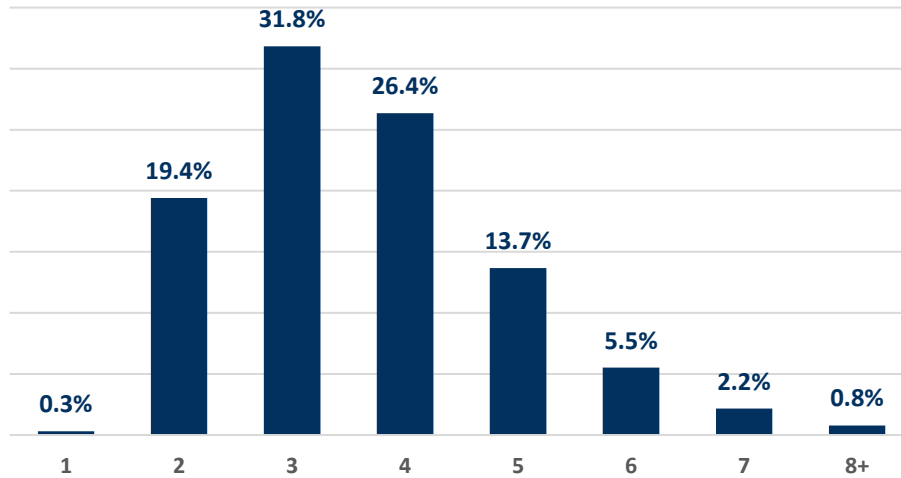


Figure 5. Total Family Income for Families Served from FY17 to FY19 (N = 2,029)

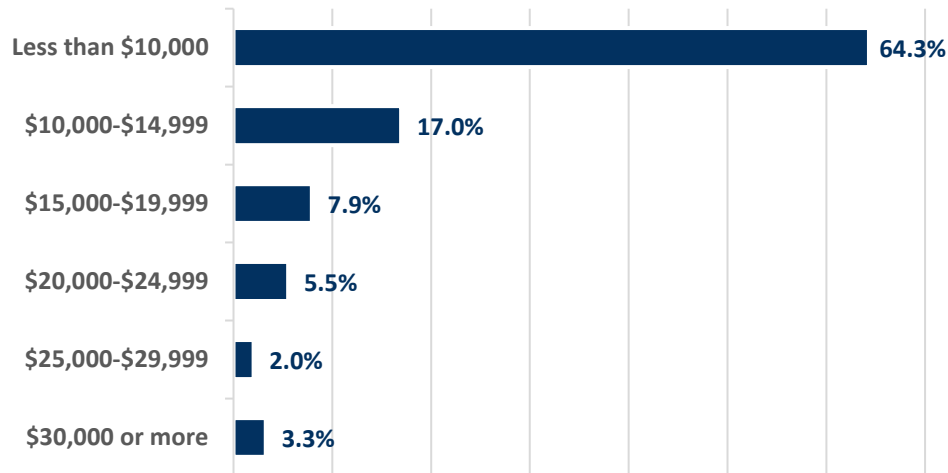


Table 2 presents the number of participants per county across all three years of the evaluation period, organized by region. **In total, the Midlands region had the greatest number of participating families (n = 699; 32.5% of total), followed by the Coastal region (n = 456; 21.2% of total).** The remaining regions all had comparatively similar numbers and percentages of participating families, including the Catawba region (n = 229; 10.6%), Pee Dee region (n = 212; 9.9%), Lowcountry region (n = 198; 9.2%), Upstate region (n = 192; 8.9%), and Piedmont region (n = 162; 7.5%). At least one county in each region had 0 total participating families.

Table 2. Region and County of Participants Served (N = 2,148)

| Region | County | Number of Participants | Region | County | Number of Participants |
|------------|--------------|------------------------|----------|--------------|------------------------|
| Catawba | Cherokee | 0 | Pee Dee | Chesterfield | 0 |
| | Chester | 44 | | Darlington | 31 |
| | Fairfield | 45 | | Dillon | 89 |
| | Lancaster | 0 | | Florence | 31 |
| | Newberry | 44 | | Lee | 15 |
| | York | 96 | | Marion | 0 |
| Coastal | Berkeley | 156 | Piedmont | Marlboro | 46 |
| | Charleston | 113 | | Abbeville | 55 |
| | Colleton | 44 | | Aiken | 49 |
| | Dorchester | 48 | | Edgefield | 0 |
| | Georgetown | 12 | | Greenwood | 25 |
| | Horry | 83 | | McCormick | 33 |
| | Williamsburg | 0 | | Saluda | 0 |
| Lowcountry | Allendale | 52 | Upstate | Anderson | 0 |
| | Bamberg | 36 | | Greenville | 0 |
| | Barnwell | 0 | | Laurens | 27 |
| | Beaufort | 38 | | Oconee | 24 |
| | Hampton | 20 | | Pickens | 61 |
| | Jasper | 52 | | Spartanburg | 0 |
| Midlands | Calhoun | 82 | Union | 80 | |
| | Clarendon | 76 | | | |
| | Kershaw | 59 | | | |
| | Lexington | 200 | | | |
| | Orangeburg | 0 | | | |
| | Richland | 161 | | | |
| | Sumter | 121 | | | |

3. Which key risk factors for early school failure do the children and families served face?

Risk factors are characteristics that increase the likelihood of a negative outcome; protective factors are characteristics that can alleviate the impact of risk factors on children’s developmental outcomes. Importantly, as the number of risk factors increases, the likelihood of poor social, emotional, behavioral, or health outcomes increases. This increase in poor outcomes appears to occur with exposure to 4 or more risk factors (see the classic study on Adverse Childhood Experiences¹¹).

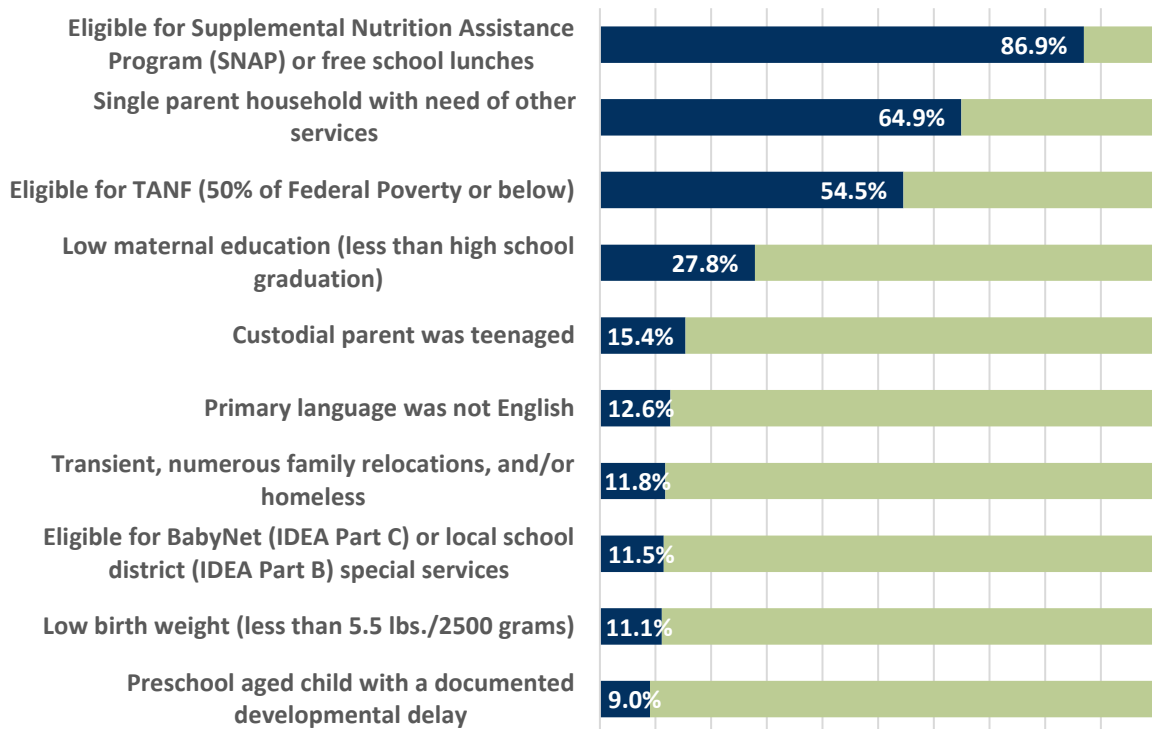
¹¹ Felitti, V. J., Anda, R. F., Nordenberg, D., Williamson, D. F., Spitz, A. M., Edwards, V., Koss, M. P., & Marks, J. S. (1998). Relationship of childhood abuse and household dysfunction to many of the leading causes of death in adults: The Adverse Childhood Experiences (ACE) Study. *American Journal of Preventive Medicine, 14*, 245-258. [https://doi.org/10.1016/S0749-3797\(98\)00017-8](https://doi.org/10.1016/S0749-3797(98)00017-8).

Among the 21 key risk factors for early school failure that SCFS considers for PAT program eligibility for children and families, the most frequently experienced risk factors for PAT program participants during the evaluation period were:

- ◆ **Eligibility for the Supplemental Nutrition Assistance Program (SNAP) or free school lunches** (86.9% of participants)
- ◆ **Belonging to a single-parent household** (64.9% of participants)
- ◆ **Eligibility for TANF based on having income at or below 50% of the federal poverty level** (54.5% of participants)
- ◆ **Maternal education lower than high school graduation** (27.8% of participants)
- ◆ **Teenaged custodial parent** (15.4% of participants)

Percentages of families with the top ten most frequent risk factors considered are displayed in Figure 6.

Figure 6. Top 10 Most Frequent Risk Factors for PAT Participants and Families (N = 2,127)



Other risk factors with lower frequency (and not listed in Figure 6) included domestic violence (7.5%), substance abuse (6.0%), parent(s) incarcerated or released from incarceration within the past year (4.8%), a parent or caregiver with an intellectual disability (4.3%), death of a member of the child's immediate family (3.7%), a recent immigrant or refugee family (3.3%), referral for neglect (3.0%), referral for abuse (2.4%), foster child (2.1%), a parent or guardian deployed or within two years of returning from active duty deployment (1.9%), and a child removed for behavioral reasons from one or more child care, Head Start,

or preschool settings (0.4%). Please note that lower frequency should not be interpreted as lower severity of risk for these children and their families.

KEY FINDINGS

- ☑ When averaged across all participants, children of adults who participated in the PAT program during the evaluation period had an **average of 3.4 risk factors** ($SD = 1.7$).
 - ☑ The number of risk factors per person ranged from 0 to 13, with a median of 3 risk factors.
 - ☑ A total of 4.0% of participants ($n = 84$) had 0 risk factors.
 - ☑ A total of 9.1% of participants had 6 or more risk factors
- Most participants (81.6%) had between 2 and 5 risk factors
- ◆ 3.3% had **1 risk factor** ($n = 69$)
 - ◆ 19.8% had **2 risk factors** ($n = 417$)
 - ◆ 29.8% had **3 risk factors** ($n = 628$)
 - ◆ 21.6% had **4 risk factors** ($n = 455$)
 - ◆ 12.7% had **5 risk factors** ($n = 267$)
- ☑





PROGRAM SERVICES PROVIDED

What PAT program services were provided through local partnerships from FY17 to FY19?

1. How long were participants enrolled in PAT program services?

PAT services are designed to be delivered over a two-year period. To understand the total length of time participants were enrolled in the PAT program, the research team examined program entry and exit dates for each adult who participated sometime within the evaluation period of FY17 to FY19. The latest possible exit month was considered to be June 2019, representing the end of evaluation period.

METHODOLOGY NOTE

There were an abnormally high number of duplicate entries within enrollment time data (i.e., numerous entry and exit dates per adult), perhaps due to the structure of the data system. To resolve duplicates, the research team first removed all rows that represented a complete duplicate with another row (i.e., no unique information between rows). Next, if entry dates matched between two or more rows within a single adult's data, the longer total enrollment time was selected. The same was performed for exit dates: if exit dates matched between two or more rows within a single adult's data, the longer total enrollment time was selected. Next, following consultation with SCFS staff, when any adult had multiple rows with less than three months' difference between entry dates or exit dates, the longer enrollment time was selected. After following these steps, a total of 131 adults still had duplicate rows. These duplicates were examined manually, during which the research team selected the longer enrollment period for 76 adults with duplicates that overlapped in time, and the research team added up multiple enrollment periods for 55 adults with duplicates that did not overlap in time.

Following all duplicate resolution procedures, outliers were examined. Any total enrollment time over 10 years was removed, resulting in 7 data points removed. Following all data cleaning procedures, **enrollment time data were available for a total of 1,774 adults. The average total enrollment time was 1.7 years ($SD = 1.5$ years). The median enrollment time was 1.3 years.** This average enrollment time is close to the desired two-year length of program enrollment as included in the SCFS PAT Accountability Standards and in alignment with the national standards for PAT. Theoretically, one would expect to see increased program impact with a greater length of enrollment.

2. How many home visits were provided to participants?

KEY FINDING

A total of 61,969 home visits were successfully conducted between FY17 and FY19 for 2,116 families.

- ☑ On average, visits were just over **one hour long** ($M = 1.1$ hours; $SD = 0.3$ hours; median = 1 hour).
 - ☑ An additional 1,764 home visits were attempted (but not successful) between FY17 and FY19.
 - ☑ The PAT program had a goal of 24 home visits per family per fiscal year. The average number of home visits per family per fiscal year was 17.9 ($SD = 9.7$).
 - ☑ A total of 9.1% of participants had 6 or more risk factors
- For those families that received at least one visit:**
- ☑
 - ◆ The median number of home visits per family per fiscal year was 19.
 - ◆ The percentage of families receiving 12+ visits per fiscal year was 72.2%.

Table 3 shows frequencies of visits per fiscal year for those families that received at least one home visit.

Table 3. Frequencies of Home Visits Per Family Per Fiscal Year

| Visits per FY | Count | Percent |
|-------------------|-------|---------|
| 1-5 visits | 462 | 13.3% |
| 6-11 visits | 503 | 14.5% |
| 12-17 visits | 520 | 15.0% |
| 18-23 visits | 918 | 26.5% |
| 24-29 visits | 805 | 23.2% |
| 30-35 visits | 148 | 4.3% |
| 36-41 visits | 66 | 1.9% |
| 42-47 visits | 34 | 1.0% |
| 48 or more visits | 14 | 0.4% |

The PAT program standards for SCFS have a goal of 2.0 average visits per family per month, with 1.8 average considered the minimal threshold and 2.5 and above considered outstanding intensity. For those families that received at least one home visit:

- ◆ The average number of home visits per family per month was 2.3 ($SD = 0.9$).
- ◆ The median number of home visits per family per month was 2.
- ◆ The percentage of families receiving 2+ visits per month was 99.3%.

Table 4 shows frequencies for visits per month for those families that received at least one home visit.

Table 4. Frequencies of Home Visits Per Family Per Month

| Visits per Month | Count | Percent |
|------------------|--------|---------|
| 1 visit | 182 | 0.7% |
| 2 visits | 2,797 | 10.3% |
| 3 visits | 16,624 | 61.4% |
| 4 visits | 5,010 | 18.5% |
| 5 visits | 1,897 | 7.0% |
| 6 visits | 385 | 1.4% |
| 7 visits | 83 | 0.3% |
| 8 visits | 28 | 0.1% |
| 9 visits | 30 | 0.1% |
| 10+ visits | 46 | 0.2% |

2. How many Group Connections were made?

Group parent education meetings augment home visitation for families involved in PAT; SCFS PAT Accountability Standards note that 12 such group meetings are offered each year (one per month). From FY17 to FY19, participants attended a **total of 1,000 such group meetings**. Of the total 2,116 participants whose home visit data were made available to the research team, 17.7% ($n = 374$) attended at least one group meeting. Table 5 shows frequencies for number of group meetings per family over the total evaluation period for those that attended at least one group meeting.

Table 5. Frequencies of Group Meetings Per Family Across FY17 to FY19

| Meetings per Family | Count | Percent |
|---------------------|-------|---------|
| 1 meeting | 147 | 39.3% |
| 2 meetings | 72 | 19.3% |
| 3 meetings | 60 | 16.0% |
| 4 meetings | 36 | 9.6% |
| 5 meetings | 24 | 6.4% |
| 6+ meetings | 35 | 9.4% |

3. What referrals did participants receive for other services?

An important aspect of the PAT program is to identify needs for services that could meet identified needs among families being served by the PAT program. This is a critical function, as no single program is likely to address or ameliorate risk factors related to early school failure. From FY17 to FY19, a **total of 14,191 referrals were made** for other services. These referrals were spread across 1,574 families.

- ◆ 89.0% ($n = 12,633$) of referrals were made through **SCFS**, while the other 11.0% ($n = 1,558$) were made through other sources.
- ◆ For those participants who received at least one referral (i.e., not including participants who received 0 referrals):
 - ◆ The **average number of referrals** per participant was 9 ($SD = 14$)
 - ◆ The **median number of referrals** per participant was 4

The evaluation team received additional data detailing the providers and the type of resource to which participants were referred. The most common types of referrals were for **family events/activities** (n = 4,420 referrals), **early education programs** (n = 1,071 referrals), **library resources** (n = 1,045 referrals), **family connection** (n = 511 referrals), and **housing resources** (n = 437 referrals).

Many organizations and programs that participants were referred to are listed in the referrals list under multiple names and in combination with multiple other organizations/programs, so referral sample sizes may underrepresent the true number of referrals to a particular program. For example, the STAR parenting program was often referred with other services (e.g., Cayce-West Columbia Library, Lexington County First Steps).

KEY FINDING

While each individual referral included data about the type of resource to which participants were referred, only some referrals included data about the specific provider to which participants were referred. Of the providers listed, PAT participants were most frequently referred to:

- ✓ Books by the Bushel (n = 453 referrals)
- ✓ STAR (n = 427 referrals)
- ✓ Early Childhood Center (n = 221 referrals)
- ✓ Housing Authority of the City of Sumter (n = 200 referrals)
- ✓ Bright Beginnings (n = 126)





FIRST STEPS ARRAY OF SERVICES

How does PAT service provision fit within the service array provided by SC First Steps local partnerships and key early childhood partners?

1. How many families receiving PAT program services were also receiving childcare scholarships?

Out of the total 2,150 adults who participated within the evaluation period of FY17 to FY19, a total of **364 families received childcare scholarships (16.9%)**.

METHODOLOGY NOTE

- ✓ Many families receiving childcare scholarships were listed with different levels of scholarship (i.e., full-time, part-time, and wrap-around scholarships) or different methods of connection to the scholarship (e.g., through DSS, in-house, ABC vouchers, etc.).
- ✓ This appeared to indicate that families received scholarships across multiple years, but the year of the scholarship was not provided for data analysis.
- ✓ As such, **a total of 704 scholarships** are included in the findings below, spread across **364 unique families**. No duplicates were removed; instead, the research team assumed duplicate data represented multiple different years of scholarship within the same family or scholarships for care of multiple children within the same family.

Of the 704 total scholarships provided across 364 families, the majority (n = 521, 74.0%) were full-time scholarships. An additional 13.6% (n = 96) were part-time. Less than 5 total scholarships were wrap-around.

A total of 12.1% of scholarship data (n = 85) did not indicate whether the scholarship was full-time, part-time, or wrap-around; these data are included in the report because a point of connection or termination date was present in the data. Point of connection data indicated that **most scholarships were obtained through childcare vouchers that SCFS purchased through the SC Department of Social Services (DSS; n = 415; 58.9%) or through SCFS paying a childcare center directly (n = 236; 34.8%)**. The remaining scholarships came from DSS ABC vouchers (n = 10; 1.4%) or did not have a specific source identified (n = 43; 6.1%).



PREDICTORS OF SCHOOL READINESS

What is the impact of PAT program services on key predictors of school readiness?

1. How do PAT services impact the quality of the observed parent-child relationship?

An important and central outcome of home-visiting services is to strengthen parent-child relationships. Parenting supports and interventions that assist parents to engage responsively and warmly with their children, encourage positive daily interactions, establish and maintain safety, and provide structure and limits in a non-coercive manner are particularly important.¹² A recent quasi-experimental study demonstrated impact of PAT on both improved parenting and child academic outcomes.¹³ Thus, in order to examine impact of services on the parent-child relationship, SCFS makes use of an observational measure known as the Keys to Interactive Parenting (KIPS) scale.

The KIPS assessment is a standardized, observational measure of interactive parenting behaviors used by SCFS to assess the responsiveness and quality of the parent-child relationship. KIPS scores range from 1 to 5, with a score of 5 indicating better performance—and thus stronger parenting skills. Scores are designed to be grouped into three categories: scores 1.00 to 2.99 indicate low-quality parenting, scores 3.00 to 3.99 indicate moderate-quality parenting, and scores 4.00 to 5.00 indicate high-quality parenting.

KIPS data were available for a total of 1,837 families. Within the PAT program, the KIPS assessment is tied to a focus child and is completed every six months. While some families only had one KIPS score, for many families the assessment was performed at multiple time points as the focus child aged and as the family spent more time supported by the PAT program. When a family exits the PAT program, a final KIPS assessment is conducted prior to the final home visit. **In total, 4,696 KIPS assessments were included in evaluation data. The majority of KIPS assessments were performed with a child's mother (n = 4,414; 93.4%).** The remaining KIPS assessments were performed with a child's grandmother (n = 158; 3.4%), father (n = 69; 1.5%), or aunt (n = 21; 0.4%). Less than 5 KIPS assessments were performed with a child's sister or grandfather, and an additional 27 KIPS assessments were performed with other (non-specified) guardians or family members.

METHODOLOGY NOTE

Because KIPS data were not available for a comparison group of non-PAT families, the evaluation team looked at KIPS data only within the PAT cohort. To understand assessment results, the evaluation team considered KIPS scores from multiple perspectives. Two methods were utilized: (1) comprehensive

¹² Harper Browne, C. & Shapiro, C. J. (2016). Building young children's social-emotional competence at home and in early care and education settings. In Shapiro, C. J. & Harper Browne, C. (Eds.), *Innovative Approaches to Supporting Families of Young Children* (pp. 87-105). Switzerland: Springer.

¹³ Lahti, M., Evans, C. B. R., Goodman, G., Schmidt, M. C., & LeCroy, C. W. (2019). Parents as Teachers (PAT) home-visiting intervention: A path to improved academic outcomes, school behavior, and parenting skills. *Children and Youth Services Review, 99*, 451-460. <https://doi.org/10.1016/j.childyouth.2019.01.022>

descriptive analysis of all 4,696 KIPS assessments regardless of family and (2) more selective descriptive analysis that selected the first and last scores for each family during their enrollment in PAT services.

KIPS scores ranged from 1 to 5, as expected. **The average score across all 4,696 KIPS scores was 3.46 ($SD = 0.78$)**, representing “moderate-quality parenting” on the KIPS scoring system. It is important to note that these KIPS assessments were performed throughout PAT program enrollment, including the start of enrollment. As such, the average KIPS score provides important information about the population of caregivers and children involved in these assessments, but it does not demonstrate the results of program participation.

The evaluation team performed a more targeted descriptive analysis by examining the first and last KIPS scores chronologically within each family. These alternative methods of examining KIPS scores are particularly helpful because comparison group data were not available to establish whether the PAT program caused change in KIPS scores. Examining KIPS scores using methods that account for how scores may have changed over time does not provide definitive evidence that the PAT program *caused* the *change* in KIPS scores, but it does provide evidence that change in KIPS scores *occurred over the course of program participation*. Using the first and last KIPS scores chronologically provides more information than the average of all KIPS scores because the number of KIPS scores per family varied, with some families having only one KIPS score at one single time point and others having multiple KIPS scores at regular intervals over multiple years. When a family had only one score, their single score was included in all results. However, when families had multiple scores available, the overall average of all KIPS scores presented above does not provide information about how families’ scores may have changed over time. Selecting the first KIPS score per family chronologically and the last KIPS score per family chronologically shows information about whether KIPS scores changed from the first time point available in each family to the final time point available in each family, while still accounting for families with only one time point available. Results of these alternative methods of examining KIPS score are presented in Table 6.

Table 6. Descriptive Statistics within Family Across FY17 to FY19 (N = 1,837 Families)

| Score Description | Mean | Median | Standard Deviation |
|---------------------------------------------|------|--------|--------------------|
| First (Chronological) KIPS Score per Family | 3.28 | 3.30 | 0.76 |
| Last (Chronological) KIPS Score per Family | 3.57 | 3.58 | 0.76 |

Although definitive evidence that the PAT program caused the change cannot be established with this descriptive analysis, **the first KIPS score chronologically for each family had an average of 3.28, while the last KIPS score chronologically for each family had an average of 3.57**. There is thus indication that KIPS scores increased on average within PAT families from their first to last KIPS assessment completed as part of PAT services, even while including those families that had only a single KIPS score (i.e., those families for whom change over time could not be examined). The median scores showed a similar pattern: the median KIPS score for the first time point available within each family was 3.30, while the median KIPS score for the last time point available within each family was 3.58. The standard deviation was equivalent

across first and last KIPS scores per family, indicating variance among scores was not substantially different when considering first and last scores separately. **Taken together, these descriptive results point toward positive signs that KIPS scores increased over the course of participation in the PAT program. To enhance the determination that it is the PAT program that caused these changes in KIPS scores over time, comparison to a control group of non-PAT families would be highly beneficial.**

2. How do PAT services impact the interactive reading skills of parents?

Parents play an important and possibly unique role in the development of emergent literacy and reading skills in their children. One way to support child development of these important skills is through joint reading, in which parents interactively read to their young children. An older meta-analysis (study of studies) found that parent-preschooler reading positively impacted child emergent literacy and reading skills¹⁴ and adult-child interactions during joint book reading fostered the development of children's pre-literacy skills. Storybook reading has also been found to enhance verbal skills, above the impact of joint writing (which appeared to enhance word recognition and phonological awareness¹⁵). Joint storytelling exposes children to print language, and a recent experimental study found enhanced fixation time on print when a parent read to their 4–6-year-old child (as compared to an experimenter reading the story)¹⁶.

Relevant to our assessment of the impact of PAT on both parenting and on emergent literacy skills for children, SCFS uses the Adult Child Interactive Reading Inventory (ACIRI), an observational assessment of how adults and children interact during reading. The ACIRI is scored on a scale from 0 to 3, with a higher scoring indicating a higher quality of adult-child interaction. During observational scoring, a score of 0 indicates no evidence, a score of 1 indicates the behavior is observed infrequently, a score of 2 indicates the behavior is observed some of the time, and a score of 3 indicates the behavior is observed most of the time. The ACIRI allows researchers and practitioners to track change in important adult-child interactions related to child development of literacy skills over time in three different behavioral areas: **1) enhancing attention to text, 2) promoting interactive reading and supporting comprehension, and 3) using literacy strategies.** Both the adult and the child in the interaction receive scores in all three areas.

METHODOLOGY NOTE

Since ACIRI data were not available for a comparison group of non-PAT families, the evaluation team looked at ACIRI data only within the PAT cohort. Mirroring KIPS results, the evaluation team looked at comprehensive ACIRI data across all 2,566 ACIRI assessments, then performed a more targeted descriptive analysis that accounted for cases with multiple measurements per family. In the case of ACIRI data, the evaluation team was provided with an indicator of whether the ACIRI occasion represented a pre-test or a post-test, so this indicator is used in the more targeted analysis.

¹⁴ Bus, A. G. et al. (1995). Joint book reading makes for success in learning to read: A meta-analysis on intergenerational transmission of literacy. *Review of Educational Research*, 65(1), 1–21.

¹⁵ Aram, D., & Levin, I. (2002). Mother-child joint writing and storybook reading: Relations with literacy among low SES kindergartners. *Merrill-Palmer Quarterly*, 48(2), 202–224. <https://doi.org/10.1353/mpq.2002.0005>

¹⁶ Zivan, M., & Horowitz-Kraus, T. (2020). Parent-child joint reading is related to an increased fixation time on print during storytelling among preschool children. *Brain Cognition*, 143. doi: 10.1016/j.bandc.2020.105596.

ACIRI data were available for a total of 1,159 families who participated within the evaluation period of FY17 to FY19. Similar to the KIPS, the ACIRI is tied to a single focus child within a family and is completed when the focus child is approximately 30 months old, then every 6 months thereafter. When a family exits the program, a final ACIRI is completed prior to the final home visit. Some families had data from multiple ACIRI assessments, while others had data from only a single assessment occasion. **In total, 2,566 ACIRI assessments were included in evaluation data.**

Mirroring the KIPS assessments, the majority of ACIRI data measured mother-child interactions (n = 2,391; 93.2%). A total of 102 measurements (4.0%) observed grandmother-grandchild interactions, 43 (1.7%) observed father-child interactions, and 17 (0.7%) measured aunt-child interactions. All other relationships represented less than 5 ACIRI measurements. ACIRI scores ranged from 0 to 3, as expected. The average scores across all 2,566 ACIRI assessments are presented in Table 7. **On average, both adults and children scored the highest in enhancing attention to text and the lowest in using literacy strategies.**

Table 7. Descriptive Statistics Across All ACIRI Assessments FY17 to FY19 (N = 2,566 ACIRI Tests)

| Interaction Participant Scored | Score Description | Mean | Median | Standard Deviation |
|--------------------------------|------------------------------------------------------------|------|--------|--------------------|
| Adult | Enhancing Attention to Text | 2.41 | 2.50 | 0.57 |
| | Promoting Interactive Reading and Supporting Comprehension | 1.98 | 2.00 | 0.71 |
| | Using Literacy Strategies | 1.58 | 1.50 | 0.82 |
| Child | Enhancing Attention to Text | 2.25 | 2.25 | 0.66 |
| | Promoting Interactive Reading and Supporting Comprehension | 1.71 | 1.75 | 0.79 |
| | Using Literacy Strategies | 1.42 | 1.50 | 0.86 |

To further explore ACIRI scores, the evaluation team analyzed scores recorded in the data set as pre-test and post-test measurement (i.e. at the beginning and end of PAT services). While families may still have multiple pre-test or post-test measurements, the differentiation provides information that could point toward indication of improvement in ACIRI scores over time. A total of 1,372 scores represented pre-test ACIRI measurements, and a total of 1,194 scores represented post-test ACIRI measurements. Descriptive statistics are presented in Table 8, which shows that **the mean and median for ACIRI scores labeled as post-test scores were higher for both children and adults across all ACIRI components.**

Table 8. Descriptive Statistics for ACIRI Scores by Pre-Test/Post-Test (N = 2,566 ACIRI Tests)

| Interaction Participant Scored | Score Description | Pre-Test Mean | Post-Test Mean | Pre-Test Median | Post-Test Median | Pre-Test SD | Post-Test SD |
|--------------------------------|------------------------------------------------------------|---------------|----------------|-----------------|------------------|-------------|--------------|
| Adult | Enhancing Attention to Text | 2.29 | 2.55 | 2.25 | 2.75 | 0.60 | 0.50 |
| | Promoting Interactive Reading and Supporting Comprehension | 1.80 | 2.19 | 1.75 | 2.25 | 0.72 | 0.64 |
| | Using Literacy Strategies | 1.37 | 1.83 | 1.25 | 2.00 | 0.78 | 0.79 |
| Child | Enhancing Attention to Text | 2.12 | 2.40 | 2.25 | 2.50 | 0.68 | 0.60 |

| | | | | | | |
|------------------------------------------------------------|------|-------------|------|------|------|------|
| Promoting Interactive Reading and Supporting Comprehension | 1.51 | 1.94 | 1.50 | 2.00 | 0.77 | 0.74 |
| Using Literacy Strategies | 1.21 | 1.67 | 1.25 | 1.75 | 0.82 | 0.85 |

Although these descriptive results do not provide evidence of causation (i.e., do not show that the PAT program *caused* ACIRI scores to increase) because they could not be compared to how scores would change in a comparison group of parents and children (which would rule out maturation or time as a cause of the change), they do point toward positive signs that ACIRI scores appear to increase over the course of participation in the PAT program. To provide a stronger test of causality (i.e. that it was the PAT intervention that caused the change in ACIRI scores over time), comparison to a control group of non-PAT families would be highly beneficial.

Finally, to explore ACIRI scores chronologically (i.e., rather than based only on the indicator provided to the evaluation team of pre-test and post-test scores), the evaluation team selected only the first and last ACIRI measurement occasion per family, regardless of whether they were labeled by SCFS as a pre-test or a post-test. This method was chosen to eliminate any bias or error present in the provided pre-test/post-test indicator, as many families had multiple pre-test or multiple post-test ACIRI scores. Results are presented in Table 9. If any family had only one ACIRI score, that single score was used in both the first and last selections (a conservative approach to examine such scores). **Results show that the average for each component of the *last* ACIRI measurement per family is higher than the average for each component of the *first* ACIRI measurement per family. The same is true for the median of each.**

Table 9. Descriptive Statistics for First and Last ACIRI Score Per Family (N = 1,159 Families)

| Interaction Participant Scored | Score Description | First ACIRI Mean | Last ACIRI Mean | First ACIRI Median | Last ACIRI Median | First ACIRI SD | Last ACIRI SD |
|--------------------------------|------------------------------------------------------------|------------------|-----------------|--------------------|-------------------|----------------|---------------|
| Adult | Enhancing Attention to Text | 2.28 | 2.44 | 2.25 | 2.50 | 0.61 | 0.56 |
| | Promoting Interactive Reading and Supporting Comprehension | 1.79 | 2.04 | 1.75 | 2.25 | 0.71 | 0.72 |
| | Using Literacy Strategies | 1.34 | 1.67 | 1.25 | 1.75 | 0.78 | 0.84 |
| Child | Enhancing Attention to Text | 2.10 | 2.30 | 2.25 | 2.50 | 0.69 | 0.65 |
| | Promoting Interactive Reading and Supporting Comprehension | 1.48 | 1.79 | 1.50 | 1.75 | 0.77 | 0.80 |
| | Using Literacy Strategies | 1.17 | 1.52 | 1.00 | 1.50 | 0.82 | 0.89 |

While these results do not provide firm evidence of causation (i.e., do not indicate that the PAT program caused changes in ACIRI scores) and do not account for change over time within each family itself, these results do serve as signs that ACIRI scores appear to increase over time during PAT program participation. To find statistical evidence that the PAT program impacts ACIRI scores over time, comparison to a control group of non-PAT families would be highly beneficial.

3. How does PAT program participation influence predictors of school readiness (i.e., KIPS and ACIRI scores)?

A series of simple regression analyses were conducted to examine the relationships between PAT program participation characteristics and assessment scores on both the KIPS and ACIRI inventories. Specifically, the evaluation team examined the relationship that total length of PAT program enrollment and total number of home visits had with KIPS and ACIRI scores. We hypothesized that a stronger dose of PAT (longer enrollment) would be associated with higher scores on both KIPS and ACIRI, reflecting greater increases in the quality of parent-child interaction and the quality of joint reading between parent and child.

As many SCFS families are enrolled in more than one services (e.g., PAT as well as child care scholarships), the evaluation team also conducted a *t*-test to determine if there was any statistically significant difference in mean KIPS and ACIRI scores between those PAT participants who received one or more childcare scholarships and those PAT participants who did not receive a childcare scholarship. For all analyses, the final chronological KIPS and ACIRI scores were used, representing the most recent measurement occasion during PAT participation relative to the evaluation period. In some cases, participants had only one measurement occasion per family.

KIPS Score Outcomes

Regarding KIPS scores, results indicated that length of PAT enrollment time significantly predicted KIPS scores, $B = 0.09$, $SE = .031$, $\beta = .09$, $p < .001$, 95% CIs [.06,.11]. **For each additional year of PAT program enrollment, KIPS scores increased by 0.09 points. In other words, the responsive quality of the parent-child interaction significantly improved the longer families were enrolled in the PAT program.** Length of PAT program enrollment accounted for a small percentage of variance in KIPS scores, $R^2 = .03$, $F(1, 1502) = 45.76$, $p < .001$. Total number of home visits also significantly predicted KIPS scores, $B = 0.01$, $SE = .00$, $\beta = .01$, $p < .001$, 95% CIs [.006,.009], with a **.01 KIPS score increase for each additional home visit, meaning that the quality of parent-child interactions significantly improved as families received more home visits.** Home visit count also accounted for a small percentage of variance in KIPS scores, $R^2 = .04$, $F(1, 1837) = 83.20$, $p < .001$. **There was no significant difference in KIPS scores between those PAT participants who received and did not receive childcare scholarships**, $t(468.4) = -0.30$, *NS*. It appears that the combination of receipt of childcare scholarships with PAT did not further impact the quality of the parent-child interactive relationship as compared to families receiving PAT alone. Importantly, this does not inform us about what other outcomes the combination of programs has and should not be interpreted in this light.

KEY FINDING

- ✓ **Length of enrollment** in the PAT program significantly predicted increased KIPS scores providing evidence that the length of exposure to the PAT program appears to improve parenting outcomes as measured by the KIPs assessment.
- ✓ **Total number of home visits** also significantly predicted KIPS scores providing evidence that the number of home visits received appears to improve parenting outcomes as measured by KIPS.

Adult ACIRI Score Outcomes

Regarding adults' ACIRI scores, results indicated that length of PAT enrollment also significantly predicted ACIRI scores for adults' interactions in the areas of enhancing attention to text, $B = 0.05$, $SE = .011$, $\beta = .05$, $p < .001$, 95% CIs [.03,.07], promoting interactive reading and supporting comprehension, $B = 0.09$, $SE = .014$, $\beta = .09$, $p < .001$, 95% CIs [.06,.12], and using literacy strategies, $B = 0.13$, $SE = .017$, $\beta = .13$, $p < .001$, 95% CIs [.10,.16]. **Each extra year of enrollment in the PAT program was associated with an increase of .05 to .13 points on the three areas of the adult ACIRI. In other words, adults' interactive reading significantly improved the longer they were enrolled in the PAT program in all three areas: enhanced attention to text, increased promotion of interactive reading and comprehension activities, and increased use of literacy strategies.** Length of PAT program enrollment accounted for a small percentage of variance in all three ACIRI areas: enhancing attention to text, $R^2 = .02$, $F(1, 911) = 19.70$, $p < .001$, promoting interactive reading and supporting comprehension, $R^2 = .04$, $F(1, 911) = 36.03$, $p < .001$, and using literacy strategies, $R^2 = .06$, $F(1, 911) = 60.88$, $p < .001$.

Results for total number of home visits received mirrored those of enrollment time, as total number of home visits significantly predicted ACIRI scores for adults' interactions in the areas of enhancing attention to text, $B = 0.003$, $SE = .001$, $\beta = .003$, $p < .001$, 95% CIs [.002,.005], promoting interactive reading and supporting comprehension, $B = 0.005$, $SE = .001$, $\beta = .01$, $p < .001$, 95% CIs [.003,.007], and using literacy strategies, $B = 0.007$, $SE = .001$, $\beta = .007$, $p < .001$, 95% CIs [.005,.009]. **Each extra home visit was associated with an increase of .003 to .007 points on the three areas of the adult ACIRI, meaning adults' interactive reading improved as families received more home visits.** Number of home visits accounted for a small percentage of variance in all three ACIRI areas: enhancing attention to text, $R^2 = .02$, $F(1, 1159) = 20.78$, $p < .001$, promoting interactive reading and supporting comprehension, $R^2 = .03$, $F(1, 1159) = 32.49$, $p < .001$, and using literacy strategies, $R^2 = .04$, $F(1, 1159) = 47.63$, $p < .001$.

KEY FINDING

Each extra **year of enrollment** in the PAT program significantly predicted:

- ✓ Enhanced *parent* attention to text
- ✓ Increased *parent* promotion of interactive reading and comprehension support activities
- ✓ Increased *parent* use of literacy strategies

Each extra **home visit** provided by the PAT program also significantly predicted increases in the three ACIRI area.



There were no significant differences in adult ACIRI scores between PAT participants who received and did not receive childcare scholarships for: enhancing attention to text, $t(352.9) = 1.55$, *NS*, promoting interactive reading and supporting comprehension, $t(399.6) = .77$, *NS*, and using literacy strategies, $t(411.3) = .71$, *NS*. It appears that the combination of receipt of childcare scholarships with PAT did not further impact the quality of adult interactive reading scores as compared to families receiving PAT alone. Importantly, this does not inform us about what other outcomes the combination of programs has and should not be interpreted in this light.

KEY FINDING

Each extra **year of enrollment** in the PAT program significantly predicted:

- ✓ Enhanced joint parent-child attention to text
- ✓ Increased joint parent-child promotion of interactive reading and comprehension support activities
- ✓ Increased joint parent-child use of literacy strategies

Each extra **home visit** provided by the PAT program also significantly predicted increases in the three ACIRI area.

Child ACIRI Score Outcomes

Regarding children's ACIRI scores, results indicated that length of enrollment time also significantly predicted ACIRI scores for child interactions in the areas of enhancing attention to text, $B = 0.06$, $SE = .013$, $\beta = .06$, $p < .001$, 95% CIs [.03,.08], promoting interactive reading and supporting comprehension, $B = 0.10$, $SE = .016$, $\beta = .10$, $p < .001$, 95% CIs [.07,.13], and using literacy strategies, $B = 0.13$, $SE = .018$, $\beta = .13$, $p < .001$, 95% CIs [.10,.17].

Each extra year of enrollment in the PAT program was thus associated with an increase of .06 to .13 points on the three areas of the child ACIRI. In other words, parent-child interactive reading significantly improved with longer enrollment in the PAT program. Length of PAT program enrollment accounted for a small percentage of variance in all three ACIRI areas: enhancing attention to text, $R^2 = .02$, $F(1, 911) = 18.90$, $p < .001$,

promoting interactive reading and supporting comprehension, $R^2 = .04$, $F(1, 911) = 35.42$, $p < .001$, and using literacy strategies, $R^2 = .06$, $F(1, 911) = 54.19$, $p < .001$.

Results for total number of home visits once again mirrored those of enrollment time, as total number of home visits significantly predicted ACIRI scores for child interactions in the areas of enhancing attention to text, $B = 0.004$, $SE = .001$, $\beta = .004$, $p < .001$, 95% CIs [.002,.006], promoting interactive reading and supporting comprehension, $B = 0.005$, $SE = .001$, $\beta = .005$, $p < .001$, 95% CIs [.003,.007], and using literacy strategies, $B = 0.008$, $SE = .001$, $\beta = .008$, $p < .001$, 95% CIs [.005,.01]. **Each additional home visit conducted was associated with an increase of .004 to .008 points on the three areas of the child ACIRI, meaning child interactive reading improved as families received more home visits.** Number of home visits accounted for a small percentage of variance in all three ACIRI areas: enhancing attention to text, $R^2 = .02$, $F(1, 1159) = 25.25$, $p < .001$, promoting interactive reading and supporting comprehension, $R^2 = .03$, $F(1, 1159) = 29.20$, $p < .001$, and using literacy strategies, $R^2 = .04$, $F(1, 1159) = 48.39$, $p < .001$.

There were no significant differences in child ACIRI scores between PAT participants who received and did not receive childcare scholarships for: enhancing attention to text, $t(366.7) = 1.29$, *NS*, promoting interactive reading and supporting comprehension, $t(412.2) = -0.39$, *NS*, and using literacy strategies, $t(404.5) = -0.31$, *NS*. It appears that the combination of receipt of childcare scholarships with PAT did not further impact the quality of child interactive reading scores as compared to families receiving PAT alone. Importantly, this does not inform us about what other outcomes the combination of programs has and should not be interpreted in this light.



IMPACT OF DEVELOPMENTAL STATUS

How does the developmental status of the child influence both school readiness and future academic success?

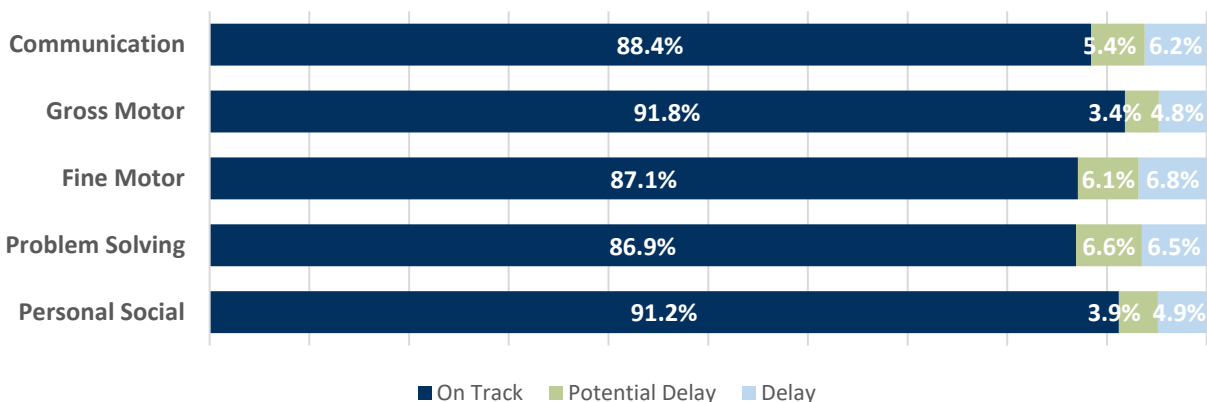
1. How many children served during the evaluation period (FY17 to FY19) were identified as being at risk for or having developmental delays?

Children experiencing developmental delays are at risk of facing future challenges in school performance. Thus, SCFS and the PAT program assess children’s developmental status using the Ages and Stages Questionnaire (ASQ). The ASQ is made up of different sets of questionnaires that screen for developmental delays based on a child’s age. One set of questionnaires targets developmental screening (ASQ-3), and another targets social-emotional screening (ASQ:SE or ASQ:SE-2). Developmental screening on the ASQ-3 assesses five skill areas: communication, gross motor, fine motor, problem solving, and personal-social. Social-emotional screening on the ASQ:SE-2 addresses self-regulation, compliance, communication, adaptive behaviors, autonomy, affect, and interaction with people. Scores are designed to be grouped into four categories: on track, potential delay, delay, and out of range.

ASQ-3 data were available for a total of 1,856 families, and ASQ:SE or ASQ:SE-2 data were available for a total of 1,793 families. Within the PAT program, the ASQ is completed for all children in the home that are ages birth through five years old. As such, families may have data for multiple children and multiple measurement occasions, or for a single child and a single measurement occasion. **In total, 6,131 ASQ-3 assessments and 4,974 ASQ:SE or ASQ:SE-2 assessments were included in the evaluation data.**

A summary of the results of all 6,131 ASQ-3 assessment results provided to the evaluation team is provided in Figure 7. The majority of ASQ-3 assessment results showed that children were on track for typical development, with **86.9% to 91.8% of all ASQ-3 assessments resulting in “on track” status across the various developmental domains.** It is important to note that the evaluation team was not able to examine the number of children this represents because the data set for families contained ASQ-3 scores for multiple children. It may be beneficial to track a child-level identifier for future ASQ assessments, in addition to the family-level identifier provided to the evaluation team.

Figure 7. Developmental Status on ASQ-3 Assessment (N = 6,131 ASQ-3 Assessments)



Summaries of the results of all 4,974 ASQ:SE and ASQ:SE-2 assessments provided to the evaluation team are provided in Figures 8 and 9. Results were available for 1,529 ASQ:SE assessments and 3,347 ASQ:SE-2 assessments. The majority of assessment results showed that children were not experiencing developmental delays, with 82.1% to 86.1% of assessments resulting in “on track” status. Once again, it is important to note that the evaluation team was not able to examine the number of children these data represent, as families may have scores for multiple children.

Figure 8. Social-Emotional Status on ASQ:SE Assessment (N = 1,529 ASQ:SE Assessments)

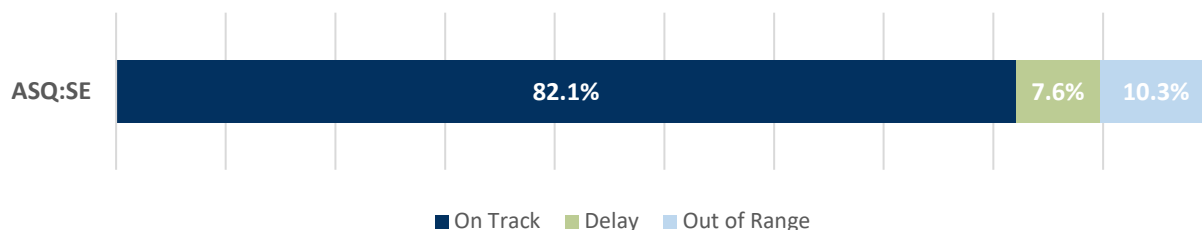
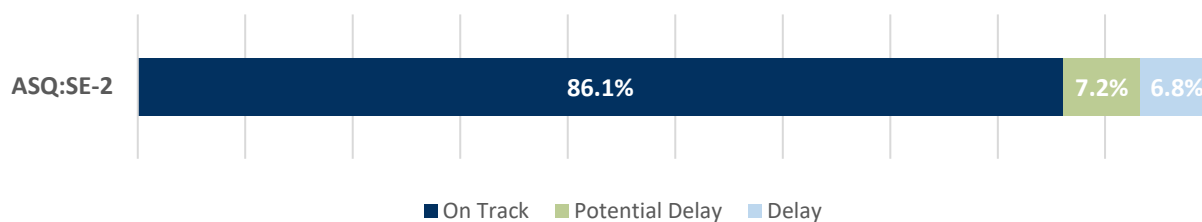


Figure 9. Social-Emotional Status on ASQ:SE-2 Assessment (N = 3,347 ASQ:SE-2 Assessments)



2. How many children served during the evaluation period (FY17 to FY19) were also classified as receiving special education services in kindergarten?

A total of 538 children that were receiving PAT services and were five years old were included in the Department of Education data provided to the evaluation team. **Of these 538 children, 60 (11.2%) were classified as receiving special education services. Thus, the majority of children served by PAT in this sample were being served in regular educational services.** To place this number of children in context, in FY17, FY18, and FY19, the number of five-year-old children receiving special education services statewide ranged from 4,630 to 4,858¹⁷. Thus, the children who received PAT appear to represent just over 1% of the population of children in special education at age 5.

¹⁷ <https://www.scstatehouse.gov/reports/DeptofEducation/IDEA%20Preschool%20Report%20Final%202021.pdf>

IMPACTS ON KINDERGARTEN READINESS



What is the impact of PAT services on school readiness as assessed by the South Carolina Kindergarten Readiness Assessment (KRA)?

1. Does PAT program participation impact South Carolina Kindergarten Readiness Assessment (KRA) performance?

The South Carolina Kindergarten Readiness Assessment (KRA) is an instrument that measures a child's school readiness in the areas of social foundations, language/literacy, mathematics, and physical well-being¹⁸. It serves as a snapshot of a student's abilities at the start of the kindergarten school year. The assessment contains scores for each component, as well as an overall score, which ranges from 202 to 298. A higher score indicates a higher level of readiness for kindergarten. Scores are grouped into three categories: Emerging Readiness (202-257), Approaching Readiness (258-269), and Demonstrating Readiness (270-298).

The evaluation team was provided with an overall KRA score for a total of 215 children whose families participated in the PAT program during the evaluation period. Importantly, the KRA was not given in FY17, so the sample size was limited to only two fiscal years (i.e., FY18 and FY19). Additionally, because the KRA is given at the start of kindergarten, the sample size was also limited by the age of children from PAT families—only a small portion of children whose families were enrolled in PAT were old enough to have received the KRA during FY18 or FY19. As shown in Figure 3 of this report, only 15.5% of children of families served between FY17 and FY19 were age 3, 4, or 5 at enrollment (i.e., the ages most likely to be eligible for the KRA during FY18 and FY19). These factors combined severely limited sample sizes for analyses of KRA data, so results of KRA analyses should be considered with caution. See Appendix D for additional details regarding KRA sample size.

KEY FINDING

- ✓ PAT program students are equivalent with non-PAT program students in school readiness—in other words, they are keeping up with comparison group students. However, limitations of school readiness data mean this finding may not be fully representative and should be considered with caution.

To evaluate whether participation in the PAT program impacts KRA performance, data from these 215 children from the PAT program ("treatment group") were compared with data from a comparison group of children whose families did not participate in the PAT program ("comparison group"). To obtain the comparison group, RFA matched each child in the treatment group to similar children in the comparison groups using county, age, gender, poverty status, and race/ethnicity. The resulting comparison group contained 1,188 children.

Table 10 presents KRA scores by readiness level, per the three categories listed above: emerging, approaching, and demonstrating readiness. The treatment group sample size was considerably smaller

¹⁸ <https://ed.sc.gov/tests/elementary/pre-k-and-kindergarten-readiness-assessments/kindergarten-readiness-assessment-kra/>

than the comparison group, so percentages should be interpreted with caution. The percentage of PAT program students demonstrating readiness (27.4%) was similar to that of the comparison group (28.5%).

Table 10. KRA Scores by Readiness Level (N = 215 Treatment; 1,188 Comparison)

| Readiness Level/KRA Score Category | Treatment Group N (%) | Comparison Group N (%) |
|------------------------------------|--------------------------|---------------------------|
| Emerging Readiness | 72 (33.5%) | 347 (29.2%) |
| Approaching Readiness | 84 (39.1%) | 500 (42.1%) |
| Demonstrating Readiness | 59 (27.4%) | 339 (28.5%) |

To evaluate whether PAT program participation impacts KRA scores, a *t*-test comparing mean KRA scores between treatment and control groups was conducted to evaluate the impact of PAT participation on students' KRA scores. The average KRA score across PAT program students was 262.96, and the average KRA score across control group students was 263.3. **Results showed that there was no significant difference between the average KRA score of PAT program students and control group students, $t(282.5) = 0.36, NS$.** These results indicate that PAT program students are equivalent with non-PAT program students in school readiness—in other words, that they are keeping up with comparison group students. Results of a regression model testing whether intervention condition (membership in the treatment vs. comparison group group) significantly predicted KRA scores mirrored results of the *t*-test, showing no significant effect of condition on KRA scores, $B = -0.34, SE = .897, \beta = -0.34, NS$. **Due to data limitations, these results should be interpreted with caution, as they may not be fully representative of the impacts of PAT on school readiness. In addition to the data limitations presented above, it is important to note that KRA data were available for only a single time point (i.e., the start of kindergarten).**

2. How do child, family, and program characteristics relate to KRA performance of PAT program participants?

While the evaluation team was unable to link many child, family, and program characteristics to KRA scores due to differences in how data are stored at the child and family levels (i.e., child data often could not be matched with family data), age at enrollment presented a limited opportunity to understand how PAT program participation may relate to school readiness. A simple regression analysis was conducted to examine the relationship between age at enrollment and KRA scores. However, results showed that age at enrollment was not a significant predictor of KRA scores, $B = 0.09, SE = 1.68, \beta = .09, NS$. In other words, **age at enrollment was not significantly related to school readiness as measured by the KRA scores. Future research would benefit from the ability to connect more child, family, and program characteristics external data sources, such as KRA scores.**



IMPACTS ON STUDENT ABSENTEEISM

What is the impact of PAT services on chronic school absenteeism?

1. Does PAT program participation impact chronic school absenteeism?

Chronic absenteeism is defined as missing more than 10% of the total school days for which a student is enrolled. The evaluation team was provided with absenteeism data for 263 children whose families participated in the PAT program between FY17 and FY19. To evaluate whether participation in the PAT program impacted absenteeism, data from these 263 children from the PAT program (“treatment group”) were compared with data from a comparison group of children whose families did not participate in the PAT program (“comparison group”). Note that the sample size was limited by child age, similar to KRA data described in the previous section. Many children in families receiving PAT services were not old enough to have school attendance data during the evaluation period.

KEY FINDING

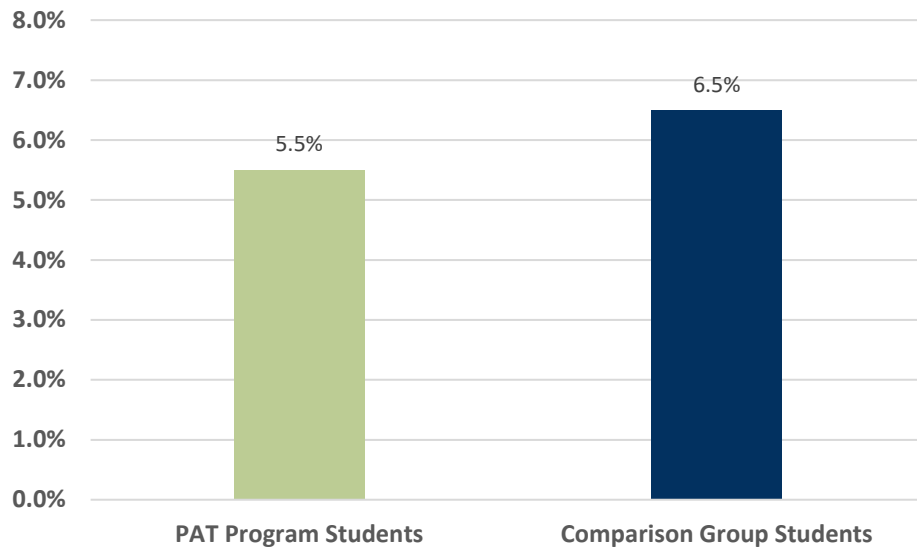
- ✓ Average absenteeism of PAT program students was significantly lower than average absenteeism of control group students

To obtain the comparison group, RFA matched each child in the treatment group to similar children in the comparison groups using county, age, gender, poverty status, and race/ethnicity. The resulting comparison group contained 1,143 children. Both the treatment and comparison group files contained some children with multiple years of absenteeism data, leading to a total of 349 data points in the treatment group and 1,396 data points in the comparison group.

A *t*-test comparing average percentage of absenteeism between treatment and control groups was conducted to evaluate the impact of PAT participation on overall absenteeism. **Results showed that the average absenteeism of PAT program students was significantly lower than average absenteeism of control group students, $t(768.7) = 2.69, p < .01$. The average percentage of school days missed for control group students was 6.5%, while the average for PAT program students was 5.5%.** Results are depicted in Figure 10, which shows the average percentage of school days missed for the treatment and comparison group. Note that a lower percentage is more desirable.

Results of a simple regression analysis confirmed that intervention condition was significantly related to percentage of school days missed, $B = -0.01, SE = .005, \beta = -.01, p < .05, 95\% \text{ CIs } [-0.02, -0.009]$. **For students in the intervention group, the percentage of school days missed was 1% lower on average.** Intervention condition accounted for a very small percentage of variance in percentage of school days missed, $R^2 = .003, F(1, 1743) = 4.62, p < .05$. It is important to note that these data are cross-sectional, meaning data represent only a single point in time. While absenteeism data were requested for multiple school years, the evaluation team received multiple years of absenteeism data for only 86 children in the PAT program intervention group. The research team thus determined that the sample size was too small for a rigorous longitudinal analysis (See Appendix D).

Figure 10. Average Percentage of School Days Missed by Group



Additionally, a chi-square test comparing *chronic* absenteeism (i.e., whether a child missed more than 10% of school days) between treatment and control groups was conducted. **Results showed that there was no significant difference in the proportion of students experiencing chronic absenteeism in the treatment and comparison groups, $\chi^2(1, N = 1,745) = 0.00, NS$. In other words, PAT program students did not experience chronic absenteeism more frequently than control group students; they kept up with the control group.** A logistic regression model predicting chronic absenteeism from intervention condition mirrored the results of the chi-square, showing no significant relationship between intervention participation and chronic absenteeism, $B = 0.005, SE = .15, NS$. Once again, it is important to note that these data are cross-sectional. It may be that there are impacts on chronic absenteeism over a longer period than a single year, but the evaluation team was unable to test any longitudinal models due to the low number of students with multiple years of absenteeism data.

2. How do child, family, and program characteristics relate to chronic school absenteeism?

Similar to the evaluation team's limitations in working with KRA data, many child, family, and program characteristics were unable to be linked to absenteeism data due to differences in how data are stored at the child and family levels (i.e., child data often could not be matched with family data). However, the evaluation team was able to examine the relationship between age at enrollment and absenteeism percentage. Results showed that age at enrollment was not a significant predictor of absenteeism, $B = 0.005, SE = .003, \beta = .005, NS$. In other words, age at enrollment was not significantly related to absenteeism within PAT program participants. **Future research would benefit from the ability to connect more child, family, and program characteristics to external data sources, like absenteeism.**



IMPACTS ON CHILD HEALTH AND WELLBEING

What is the impact of PAT services on key additional indicators of child health and wellbeing?

1. Does PAT program participation impact child maltreatment?

To evaluate whether PAT program participation impacts child maltreatment, a series of variables from the Department of Social Services (DSS) were examined in both the treatment and comparison group. First, the evaluation team examined the number of reports made to DSS in both groups, conducting a series of *t*-tests to compare reports made for PAT program participants to reports made in the matched comparison group. These results were followed up with simple regression models testing whether intervention participation was significantly related to number of reports to DSS. To obtain the comparison group, RFA matched each child in the treatment group to similar children in the comparison groups using county, age, gender, poverty status, and race/ethnicity. For the total treatment group of 2,602 children, the matched comparison group contained 10,616 children. **It is important to note that all results related to reports to DSS provide only a cross-sectional view, as the data provided to the evaluation team represented a total number of reports per child over time. It is possible that results would differ if data were available to be examined for each child over time, such as number of reports per fiscal year.**

Of the 2,602 treatment group children, 14.0% (N = 363) were involved in at least one report made to DSS. Of the 10,616 comparison group children, 15.5% (N = 1,643) were involved in one or more reports made to DSS. Frequencies of reports for both the treatment and comparison group are presented in Table 11. To further examine whether PAT program participation significantly impacted average number of reports between the treatment and comparison groups, a *t*-test was conducted. Despite the fact that a lower percentage of children in the treatment group were involved in reports to DSS than the comparison group, when comparing the average number of reports per child across all members of each group, *t*-test results showed that **there was no significant difference between the average number of reports to DSS treatment group and comparison group students were involved in, $t(4013.7) = 1.48, NS$. The average number of reports across PAT program students was 0.20, and the average number of reports across control group students was 0.22.** Results of a simple regression model examining whether condition (membership in the treatment vs. comparison group) was significantly related to the number of overall reports to DSS mirrored those of the *t*-test, showing no significant effect of condition on number of reports, $B = -0.02, SE = .013, \beta = -0.002, NS$.

Table 11. Number of Reports to DSS (N = 2,602 Treatment; 10,616 Comparison)

| Number of Reports | Treatment (Count) | Treatment (%) | Comparison (Count) | Comparison (%) |
|-------------------|-------------------|---------------|--------------------|----------------|
| 0 | 2,239 | 86.0% | 8,973 | 84.5% |
| 1 | 257 | 10.0% | 1,164 | 11.0% |
| 2 | 69 | 2.7% | 323 | 3.0% |
| 3 | 27 | 1.1% | 101 | 1.0% |
| 4 | <5 | <1.0% | 43 | 0.4% |
| 5+ | 6 | 0.2% | 12 | 0.1% |

As a follow-up question, the evaluation team examined the number of reports to DSS each child was involved in that were substantiated. When considering only those children involved in at least one report to DSS ($n = 363$ treatment group; $n = 1,643$ comparison group), at least one claim was substantiated for 47.1% ($n = 171$) of treatment group and 47.1% ($n = 774$) of comparison group children. When considering all children ($N = 2,602$ treatment; $N = 10,616$ comparison), the average number of substantiated claims per child across all treatment group students was 0.081, while the average number of substantiated claims per child across all comparison group students was 0.083. A t -test comparing the average number of substantiated reports between treatment and comparison group students showed that **there was no significant difference between the average number of substantiated reports to DSS that treatment group and comparison group students were involved in, $t(3806.2) = 0.28, NS$** . Results of a regression model examining whether condition (membership in the treatment vs. comparison group) was significantly related to the number of substantiated reports to DSS mirrored those of the t -test, showing no significant effect of condition on substantiated reports, $B = -0.002, SE = .007, \beta = -0.002, NS$.

Finally, the evaluation team examined the results of substantiated reports to DSS in terms of in-home and out-of-home (i.e., foster care) placements. Of the 171 treatment group children with at least one substantiated report to DSS, 21.1% ($n = 36$) were placed in foster care outside of the home. Of the 774 comparison group children with at least one substantiated report to DSS, 13.6% ($n = 105$) were placed in foster care outside of the home. A chi-square test comparing placement (in-home vs. out-of-home) between treatment and control groups was conducted. Results showed that the relationship between PAT participation and placement was significant, $\chi^2(1, N = 945) = 6.18, p < .05$. **When a report to DSS was substantiated, children of PAT participants were more likely to be placed in foster care than comparison group children. It is important to remember that these results are for only a subset of PAT program children—those involved in reports to DSS that were substantiated. There were only 36 PAT program children who were placed in foster care out of the 2,602 total PAT program children for whom DSS data were available, so the sample size is small and should be interpreted with caution.** See Appendix D for additional information regarding sample size for DSS data.

2. Does PAT program participation impact rate of attendance at well-child medical visits?

To evaluate whether PAT program participation impacts the rate at which children meet the recommended number of well-child visits, Medicaid data were examined in both the treatment and comparison group. Specifically, the evaluation team examined the percentage of recommended well-child visits attended in both groups, first conducting a t -test to compare the average percent attended by PAT program participants to the average percent attended by the matched comparison group and then following up with a simple regression model examining whether the relationship between intervention participation and percentage of recommended well-child visits attended was significant. To obtain the comparison group, RFA matched each child in the treatment group to similar children in the comparison groups using county, age, gender, poverty status, and race/ethnicity. For the total treatment group of 2,139 children with Medicaid data, the matched comparison group contained 7,364 children with Medicaid data.

METHODOLOGY NOTE

Data files were separated according to age, based on the recommended number of well-child visits per age group: seven visits between ages 0-1; five visits between ages 1-2; three visits between ages 3-5; and four visits between ages 6-9. Data for ages 6-9 was very limited due to the nature of the PAT program, so the 6-9 age group is not included in this report. Percentage of recommended well-child visits was calculated according to age group, with the highest percentage capped at 100%.

It is important to note that all results related to Medicaid data and the percentage of recommended well-child visits represent a single period of time; that is, Medicaid data were not able to be examined across multiple periods of recommended visits, due to the low number of children with data across multiple periods. Future research could consider examining the number of visits per child per fiscal year, but such research would disregard the number of recommended visits, as fiscal year does not align with each child's age *or* the recommended well-child visit categories.

Sample sizes by age group and condition are presented in Table 12, along with the percentage of the sample that met the recommendation within the evaluation period and the average number of visits. Note that some participants had data for more than one age group and that children may have met the recommendation outside of the evaluation period.

Table 12. Sample by Age Group and Condition (N = 2,139 Treatment; 7,364 Comparison)

| Age Group | Treatment Sample N | Treatment Met Recommend. N(%) | Treatment Average Number of Visits M(SD) | Control Sample N | Control Met Recommend. N(%) | Control Average Number of Visits M(SD) |
|-----------|-----------------------|----------------------------------|---------------------------------------------|---------------------|--------------------------------|-------------------------------------------|
| 0-1 years | 1,069 | 62 (5.7%) | 3.25 (1.90) | 2,019 | 68 (3.4%) | 2.70 (1.71) |
| 1-2 years | 1,518 | 65 (4.3%) | 2.55 (1.22) | 4,190 | 15 (0.4%) | 1.67 (0.87) |
| 3-5 years | 1,041 | 58 (5.6%) | 1.49 (0.63) | 2,800 | 14 (0.5%) | 1.09 (0.30) |

To better understand the impact of PAT participation on well-child visits, the evaluation team conducted a series of *t*-tests comparing the average percentage of recommended well-child visits in the treatment group with the average percentage of recommended well-child visits in the comparison group. **Across all three age groups—0 to 1 year, 1 to 2 years, and 3 to 5 years—results showed that the average percentage of recommended well-child visits attended was significantly higher in the PAT program treatment group than in the comparison group, $t(2007.1) = -7.94, p < .001$ for ages 0 to 1; $t(2098.2) = -25.96, p < .001$ for ages 1 to 2; and $t(1235.3) = -20.19, p < .001$ for ages 3 to 5.** Average percentage of recommended well-child visits by condition is presented in Table 13. **The average percentage of recommended well-child visits attended was higher in the treatment group across all age categories.**

To further explore the relationship between PAT participation and the percentage of recommended well-child visits attended, a series of simple regression models were tested. **Mirroring results from *t*-tests, the relationship between intervention condition and percentage of recommended well-child visits attended was significant in all three age groups.** Intervention condition was thus significantly related at age 0 to 1, *B*

= 0.08, $SE = .009$, $\beta = .08$, $p < .001$, 95% CIs [.06,.10], age 1 to 2, $B = 0.18$, $SE = .006$, $\beta = .18$, $p < .001$, 95% CIs [.16,.19], and age 3 to 5, $B = 0.13$, $SE = .005$, $\beta = .13$, $p < .001$, 95% CIs [.12,.14]. **In other words, participants in the PAT program attended approximately 8% more of the recommended well-child visits from age 0 to 1, approximately 18% more of the recommended well-child visits from age 1 to 2, and approximately 13% more of the recommended well-child visits from age 3 to 5.** PAT program participation accounted for a small percentage of variance in recommended well-child visits attended for age 0 to 1, $R^2 = .02$, $F(1, 3086) = 66.82$, $p < .001$, but a moderate percentage of variance for age 1 to 2, $R^2 = .14$, $F(1, 5706) = 918.90$, $p < .001$, and age 3 to 5, $R^2 = .16$, $F(1, 3839) = 719.75$, $p < .001$.

Table 13. Average Percentage of Recommended Well-Child Visits Attended (N = 2,139 Treatment; 7,364 Comparison)

| Age Group | Average % of Recommended Visits (PAT Treatment Group) | Average % of Recommended Visits (Comparison Group) |
|-----------|-------------------------------------------------------|----------------------------------------------------|
| 0-1 years | 46.3% | 38.5% |
| 1-2 years | 51.0% | 33.4% |
| 3-5 years | 49.3% | 36.2% |



EVALUATION SUMMARY

South Carolina First Steps to School Readiness (SCFS) was created by legislation in 1999 to lead the state's efforts in supporting school readiness for young children. SCFS is both a state agency and a non-profit organization, consisting of a state-level office and a network of 46 county-based Local Partnership offices. Supporting school readiness is a complex undertaking that requires a range of approaches, as multiple factors at the individual, family, and community levels affect the ability of children to benefit from educational opportunities. In recognition of the critical role of parenting in child development, parenting and family support programs represent one of the most significant categories of expenditure for SCFS Local Partnership offices. Parents As Teachers is the most common parenting program delivered or supported by SCFS (used by 27 of 46 Local Partnerships) and represents the largest fiscal investment in parenting programs by SCFS. In light of this significant investment, SCFS is legislatively required to evaluate prevalent programs on a five-year schedule (SC State Code § 59-152-50). The current evaluation of PAT was conducted to meet this legislative requirement.

The current evaluation of PAT was designed to examine program reach and impacts on key factors related to school success using quantitative data from FY16-17 through FY18-19. The time frame selected excludes FY19-20, the fiscal year during which the COVID-19 pandemic disrupted services and fundamentally altered life and services world-wide. This evaluation builds upon a prior external evaluation of PAT for SCFS by COMPASS that used data from FY08-09 to FY15-16. This prior evaluation focused on the establishment and implementation of PAT services within SCFS and determined that the program was being implemented according to both National PAT as well as SCFS program requirements. The prior evaluation also examined the impact of PAT services on both child and adult (parenting) outcomes; parenting outcomes showed some improvement over time while child outcome findings were mixed. Specifically, small differences were seen on a measure of school readiness (CIRCLE) between children who received PAT as compared to a large sample of children in public school who did not receive PAT, and no differences were seen between these groups in later grade retention. The current evaluation builds on this work by focusing exclusively on outcomes of PAT services at the child and parent level, using similar measures but with a more targeted comparison group of children that was created using propensity score matching, a statistical approach used to create comparison groups who are similar to the target group of children. For this report, children were selected for the comparison group based on their similarity to children whose families received PAT services in terms of geographic location (county), poverty level, race, and gender. Children were not able to be matched on all known risk factors relevant for poor educational outcomes, as these data are not available in the archival data sets used for this evaluation.

During the time frame of the evaluation, PAT reached 2,602 children and families primarily through 61,969 home visits. Families served experienced a variety of risk factors related to early school failure, as is required for eligibility for PAT services delivered or supported by SCFS. Among the 21 key risk factors for early school failure that SCFS considers for PAT program eligibility for children and families, the most frequently experienced risk factors for PAT program participants during the evaluation period were: Eligibility for the Supplemental Nutrition Assistance Program (SNAP) or free school lunches (86.9% of participants), belonging to a single-parent household (64.9% of participants), eligibility for TANF based on having income at or below 50% of the federal poverty level (54.5% of participants), maternal education

lower than high school graduation (27.8% of participants), and having a teenaged custodial parent (15.4% of participants). Importantly, when averaged across all participants, children of adults who participated in the PAT program during the evaluation period had an average of 3.4 risk factors ($SD = 1.7$). This suggests that children served by PAT in this evaluation sample are experiencing a substantial number of risk factors for poor educational outcomes.

With regard to PAT program delivery, the average length of enrollment was 1.7 years, which suggests good congruence with the PAT Essential Requirements for PAT Affiliates of at least two years of services (see Appendix A). The primary program component received by families was home visits; families received an average of 17.9 home visits per fiscal year, which approaches the PAT program goal of 24 home visits per family per fiscal year. Note that this annual average includes families who were enrolled for only a part of the fiscal year, so it may not represent the high level of support PAT families received. Perhaps a more accurate representation of home visit support is the average count of home visits monthly, as this monthly average is not impacted by families who enrolled for only part of a fiscal year. Families received an average of 2.3 home visits per month, well above the minimal threshold of 1.8 visits listed in the PAT program standards. Families participated far less in parenting group services (aka Group Connections); 17.7% of parents attended at least one group meeting, and about three-quarters of those parents who attended at least one group meeting ultimately attended 3 or less total group meetings.

PAT services also include developmental screening. The tools used for these screenings are two versions of the Ages and Stages Questionnaire, the ASQ-3 and the ASQ:SE. The ASQ-3 assesses five skill areas: communication, gross motor, fine motor, problem solving, and personal-social. Social-emotional screening using the ASQ:SE, or a more recent version, ASQ:SE-2, examines self-regulation, compliance, communication, adaptive behaviors, autonomy, affect, and interaction with people. In total, 6,131 ASQ-3 assessments and 4,974 ASQ:SE or ASQ:SE-2 assessments were included in the evaluation data. Importantly, the majority of ASQ-3 assessment results showed that children were on track for typical development, with 86.9% to 91.8% of all ASQ-3 assessments resulting in "on track" status across the various developmental domains. The majority of ASQ:SE/ASQ:SE-2 assessment results showed that between 82.1% and 86.1% of assessments showed children to be "on track" with regard to the development of social-emotional and behavioral skills. Thus, 8-18% of screenings suggested some level of developmental and/or social-emotional delays; this early identification of potential delays fortunately allows for referrals to be made for more comprehensive evaluation.

Data regarding the number of children identified by the screening tool as having developmental delays is somewhat consistent with data from the SC Department of Education, which showed that 11.2% of 5-year-olds who had received PAT were classified as receiving special education services in kindergarten (representing approximately 1% of children receiving special education services during FY17-FY19). As the ASQ measures are screening tools, it is possible that the number of children identified with potential delays is larger than the number of children who are experiencing delays to the degree that special education services are warranted.

A core focus of this evaluation was to examine the impact of PAT services on important proximal indicators of school readiness, including parenting and the parent-child relationship. PAT is a program

that focuses on parents as agents of change; thus, changes in parenting are particularly important program outcomes. Importantly, and consistent with the prior external evaluation of PAT impact, positive changes were seen over time in program recipients. Specifically, the quality of the parent-child relationship increased as the length of enrollment increased as measured by the Keys to Interactive Parenting Scale (KIPS), an observational assessment. Using a second observational measure, the Adult-Child Interactive Reading Inventory or ACIRI, positive changes were seen over time on parent-child joint reading/interactive reading skills. Specifically, the average score across families increased substantially from families' first ACIRI score under PAT enrollment to their final ACIRI score under PAT enrollment. ACIRI scores also increased as enrollment increased. In other words, scores on these important indicators of parenting skill increased as enrollment increased (a dose-response effect). While we cannot say with absolute certainty that the PAT program services caused these positive changes (as we were unable to examine these measures in a comparison group of non-PAT families), the likelihood of both measures changing in a similar direction and the positive association of both measures with the length of PAT enrollment means that it is unlikely that these observed changes happened by chance.

The impact of PAT services was also examined with regard to indicators of school performance and behavior. Kindergarten Readiness Assessment (KRA) scores were examined by readiness level (i.e., emerging, approaching, and demonstrating readiness) for children who received PAT and for a matched comparison group of similar peers who did not receive PAT. Of note, the PAT intervention group sample size was considerably smaller than the number of matched comparison group peers, so percentages should be interpreted with caution. Results were available only for FY18 and FY19, as the KRA was not utilized in FY17 (See Appendix D). The percentage of PAT program students demonstrating readiness (27.4%) was similar to that of peers in the comparison group (28.5%). No differences in average KRA performance scores were seen between children who received PAT and similar (matched) peers, suggesting that children who live in families with a significant number of known risk factors associated with early school failure who received PAT are performing similarly to children who were matched by race/ethnicity age, gender, county, and poverty level (but who are experiencing an unknown number of risk factors for early school failure). While average school absenteeism was significantly reduced for children who received PAT as compared to same age peers, the level of chronic absenteeism (i.e., the percentage of students who missed more than 10% of the total school days for which they were enrolled) was not significantly different.

PAT service impact on rates of child maltreatment was also examined, as child maltreatment prevention is an important goal of PAT services. Data from the SC Department of Social Services was analyzed to address this question and the rates of founded child maltreatment cases were similar among children who received PAT as compared to similar peers who did not receive PAT.

Child health and well-being was the final area of interest in this evaluation, given the importance of health to child development and school success. Importantly, using Medicaid data, the evaluation found that children who received PAT services attended a significantly higher percentage of the recommended number of well-child visits as compared to similar peers who did not receive PAT.

In sum, the evaluation identified strengths in PAT program delivery by SCFS PAT-trained parent educators, including high rates of home visitation services and average enrollment approaching two years. Participation in group parenting meetings was less common. The current evaluation identified positive change in important proximal factors related to school success, namely parenting skills (as assessed by two different measures) over the course of PAT enrollment. A dose-response effect was seen, in that increased time of enrollment was associated with higher scores on these parenting measures. Additionally, children/families who received PAT services participated in significantly more well-child visits as compared to a group of similar children who did not. While differences were not seen on KRA performance between children who received PAT services and similar peers who did not, the current evaluation did not examine the potential for changes in school performance or behavior later in elementary school. Importantly, the children receiving PAT are experiencing a significant number of known risk factors for poor educational outcomes whereas the number and type of risk factors experienced by the comparison group could not be examined due to data limitations.

Evaluation Limitations

As with all evaluation approaches, the current evaluation is not without limitations. The quantitative data selected for inclusion in this evaluation were truncated due to concerns about data gathered in the fiscal years impacted by the COVID-19 pandemic; thus, sample sizes were smaller than would ideally have been used for analyses, due to the more limited number of years included in this evaluation (i.e., three fiscal years), as compared to the previous evaluation (i.e., eight fiscal years of data). While regular evaluations that span shorter time periods represent a highly valuable approach that has potential to impact the usefulness of evaluation results (e.g., ability to more regularly apply findings to program practices), the shorter time span also introduces limitations worth noting (e.g., smaller sample size).

While most analyses relied on sample sizes that were large enough to facilitate confidence in the accuracy and generalizability of findings, one result of the limited years of data selected for this evaluation was that some analyses performed had especially small sample sizes. Specifically, the analyses performed regarding the impact of PAT services on KRA performance contained a sample of 215 children out of the 2,602 children served by PAT in the evaluation period. These 215 children were the only children served by PAT in the evaluation time frame who appeared in the KRA data set obtained from the SC Department of Education (via RFA). The majority of the 2,602 children served by PAT in the evaluation sample were well below age 5, and thus had not yet reached kindergarten. Additionally, the KRA was not given in FY17, so data were available only for FY18 and FY19, further limiting sample sizes. Another impact of small sample sizes was that some analyses were unable to be conducted in the planned manner. For example, while absenteeism data were requested for all three fiscal years included in the evaluation, the evaluation team received multiple years of absenteeism data for only 86 children in the PAT program intervention group. The research team thus determined that the sample size was too small for a rigorous longitudinal analysis, as was planned during evaluation scoping. See Appendix D for additional information regarding sample sizes of external data files.

With regard to the analytic approach, during analyses of child outcomes, we compared children exposed to PAT services to a propensity score matched comparison sample whenever possible. However, children in the comparison sample were able to be matched based only on location (county), gender, race, poverty

status, and age. These indicators, while important and relevant, do not represent the full spectrum of risk factor data available for children from PAT-enrolled families, as the PAT program collects much more detailed data than is available in the state-level data systems from which the comparison group was drawn. Children served by PAT during the evaluation period experienced a substantial number of risk factors predictive of poor educational outcomes, including living in a single parent household, maternal educational attainment, and having a teenage custodial parent. Thus, the propensity score matched sample was adequate but did not include additional risk factors present in the PAT sample that are known to impact educational outcomes. While this methodology created a strong comparison group for evaluation purposes, it may be that children in the comparison group experienced fewer other risk factors and were thus unequal to the comparison group in unidentifiable ways.

In addition to these limitations, there were a number of challenges with the data request process and the timeliness of data provided to the authors of this evaluation report.

- ◆ Several of the research questions included in the evaluation scope of work focus on the relationship between variables that exist at the child level and those that exist only at the parent or family level. Importantly, identifiers in the data set for specific children (“RFA ID number”) are unable to be consistently linked to identifiers that exist only at the parent or family level (“Case ID number”). Thus, it was difficult or impossible to address a number of evaluation questions as there was no way to consistently link the child-specific data generated by RFA using the RFA ID number to the parent/family within which each child lived (as specified by a case ID number in the SCFS PAT data).
- ◆ Several data requests took place with RFA before receiving the correct sample of PAT program participants for analysis for this evaluation. There was confusion around the program codes that should be used to identify those families involved in the PAT program and as a result, the correct data files were not received until October 15, 2021. For future PAT program data requests, we suggest a kick-off meeting between the research team and RFA to review the data requests in order to ensure that the appropriate variables and sample are delivered. We believe some of the data errors experienced in this study could have been avoided by additional dialogue between the research team and RFA and less reliance on email exchanges.
- ◆ PAT program data were limited by the fact that the PAT codebook does not have value labels recorded for many of the key variables of interest. This was a barrier for researchers when it came to understanding and analyzing the data and required additional efforts to request value labels for each individual variable contained in data requests.

Conclusions

The current evaluation extends findings from a prior external evaluation of PAT for First Steps by using a quantitative approach to assessing program impact on parent and child outcomes in important areas related to school success. Similar to the prior evaluation, the current evaluation finds that the program is reaching children and families who are at high risk for poor educational outcomes (averaging more than three risk factors of the twenty-one identified by SCFS). While many children and families experience risk factors for poor educational outcomes, it is the accumulation of risk factors that is of concern—the more

risk factors seen, the higher the likelihood of a poor educational outcome, especially as the number of risk factors exceeds three or more.

With regard to receipt of PAT services, the majority of families served are enrolling in PAT services when children are at an early age, with 84.5% of the current sample enrolling when children are age two and younger. Furthermore, the average length of service is 1.7 years, approaching the PAT standard of two years. Families received an average of 2.3 home visits per month, exceeding the expected standard of 2 visits per month. On average, families are receiving an 17.9 home visits per year, which may be an underestimate as this annual average includes families who were enrolled for only part of a fiscal year. Overall, visitation data suggests that that trained PAT home visitors are able to support and guide families at a high level of intensity during a most critical period of child development.

Among families served by PAT, and consistent with the prior external evaluation of PAT for First Steps, the current evaluation found positive changes over time on parenting factors important to healthy child development and school success—the quality of the parent-child relationship and parent-child interactive reading skills—which increased as length of program involvement increased. Children are also receiving important developmental screenings; the vast majority of children were found to be “on track” developmentally. External referrals are being made for additional services at a high rate.

While this evaluation did not identify significant differences between children served by PAT and a matched sample of like peers on the KRA, the limited sample size of children in the PAT group for this analysis precluded our ability to reach a firm conclusion regarding impact of PAT services on kindergarten readiness. Importantly, this finding is somewhat consistent with the prior external evaluation of PAT on a different measure of school readiness (CIRCLE), in which only small differences were noted between children who received PAT and children who did not. Extant peer-reviewed research on PAT has identified significant impact of PAT services on later academic achievement and school behavior;¹⁹ however, there are no published studies of PAT impact on measures of school readiness that can be used as a comparison for the results of this evaluation.

In addition to examining measures of school readiness like the KRA, it is also important to examine other factors that can impact a child’s academic performance such as attendance. The current evaluation showed that the average percentage of days absent for a PAT program student was significantly lower than the average percentage of days absent for students in the comparison group. Finding lower rates of absence is consistent with prior research¹⁹ and is an important finding, as attending school is a prerequisite for being able to perform well in school. That said, no differences were seen in rates of chronic absenteeism (i.e., missing 10% or more of total days enrolled in school) between children who received PAT and like peers.

¹⁹ Lahti, M., Evans, C. B. R., Goodman, G., Schmidt, M. C., & LeCroy, C. W. (2019). Parents as Teachers (PAT) home-visiting intervention: A path to improved academic outcomes, school behavior, and parenting skills. *Children and Youth Services Review*, 99, 451–460. <https://doi.org/10.1016/j.childyouth.2019.01.022>

Extending analysis of PAT program impact, the current evaluation examined the impact of PAT services on well child visits, an important indicator of child health and well-being. Children who received PAT services did participate in well child visits at a higher rate than similar children who did not; this higher level of participation in well-child services affords the opportunity for preventive healthcare and early identification of factors that can negatively impact child health, well-being, and school success. This is a novel finding, as to our knowledge, there are no prior published studies that examined PAT impact on well child visits.

Lastly, with regard to involvement in child protective services, no differences were seen between children served by PAT and similar peers with regard to the number of reports of child maltreatment either made or substantiated. Importantly, children who received PAT services have a trained parent educator conducting home visits for a substantial amount of time and attended a greater percentage of recommended well-child visits. Thus, families receiving PAT are under a higher degree of external surveillance relative to like peers, which provides more opportunities for maltreatment to be identified and reported. In this context, the finding of no difference between groups is noteworthy. Lastly, one prior study of PAT in Connecticut using a sample of first-time mothers also found no differences in regard to reports of child maltreatment but did find reduced rates of substantiated child maltreatment cases when comparing families receiving PAT to similar families who did not receive PAT.²⁰ It is possible that differences in the samples between the current evaluation (i.e. not limited to first-time mothers) and this prior work may be one reason why the findings of this evaluation are different with regard to substantiated child maltreatment cases.

Recommendations

In light of evaluation findings, we offer these recommendations for practice by First Steps and recommendations to support future research efforts.

Recommendations for First Steps

1. To support future evaluations of the impact of PAT, it is recommended that the data captured for this program include both a family/adult-level identifier as well as a child-level identifier for every case in all relevant data sets. In this manner, future analyses can both link adult/family data with child data for all outcome areas. Furthermore, this can support more sophisticated multi-level analyses accounting for the nesting of children within families.
2. Provision of PAT services by First Steps is predicated upon identification of a target child within a family. As many families served have more than one child, it is recommended that all children associated with a family are identified in the data system. In this manner, generalization of program impact can be assessed for specific outcomes at the child level.
3. Evaluating the impact of PAT services on kindergarten readiness using the KRA as an outcome measure should be performed using a larger sample of children than was possible in the current evaluation time frame.

²⁰ Chaiyachati, B. H., Gaither, J. R., Hughes, M., Foley-Schain, K., & Leventhal, J. M. (2018). Preventing child maltreatment: Examination of an established statewide home-visiting program. *Child Abuse & Neglect*, *79*, 476-484. <https://doi.org/10.1016/j.chiabu.2018.02.019>

4. It is recommended that consistent, standardized details regarding referrals made by PAT home visitors be captured in the data system. Specific details including reasons for referral (i.e. whether the referral was made as a result of an identified developmental delay or for other reasons), and the outcome of those referrals, can be useful for both practice with families as well as for program evaluation.
5. It is recommended that a detailed codebook be created for PAT program data that includes value labels recorded for key variables of interest. A detailed codebook would enhance clarity and ease interpretation of data elements captured for the PAT program and would support future program evaluations.
6. Given that the majority of families participated in relatively few group meetings that are offered as part of PAT, it is important to examine barriers to participation in these services by families.
7. First Steps has established strong internal standards for PAT service delivery that are consistent with the National PAT program standards. It is recommended that implementation data continue to be collected regarding the timing, content, and length of program delivery to assure ongoing adherence to these high standards. Additionally, further consideration of how enrollment (and unenrollment, following the end of services) dates are tracked is recommended, as enrollment data were particularly complex, with many cases of separate but overlapping enrollment time periods within a family.

Recommendations to Support Future Research

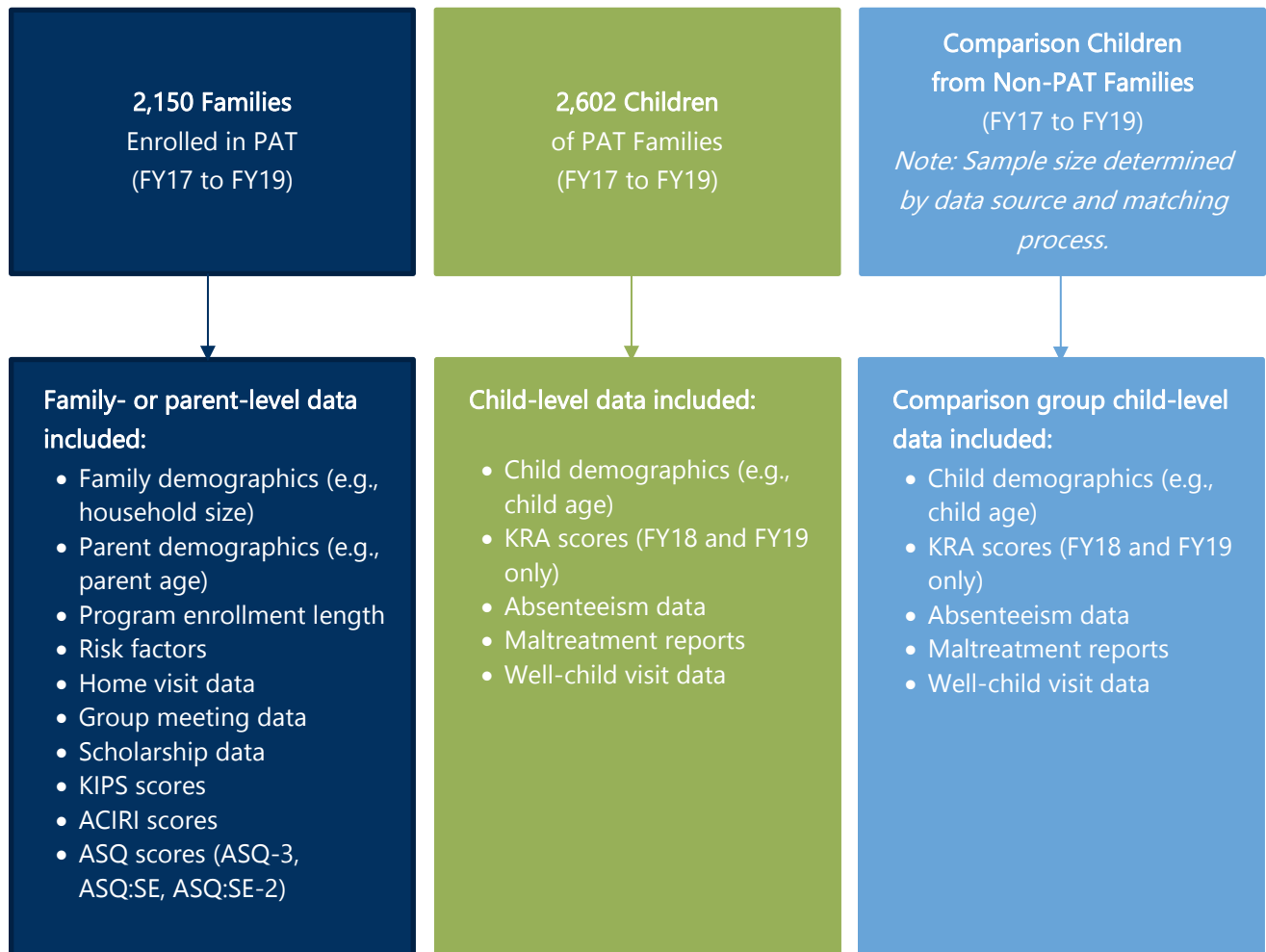
1. Further research is recommended to assess impacts of PAT services on academic performance later in elementary school, in addition to assessing impact in kindergarten using the KRA.
2. A number of protective factors relevant for child maltreatment prevention are targeted by PAT, including knowledge of child development, social support, and concrete supports. Assessment of changes in protective factors may be informative to enhance understanding of the impact of PAT services. Thus, it is recommended that measurement of protective factors using a valid and reliable tool be considered for use as a way to assess program impact in areas related to child maltreatment prevention.
3. Future research efforts are needed to expand upon this evaluation's assessment of the impact of PAT services on the quality of the parent-child relationship and on parent-child interactive reading skills. Data measuring these factors were available only for PAT families, but not for a comparison group of like peers, as measures (i.e., KIPS and ACIRI) were administered as part of PAT services. However, additional research using a comparison group would facilitate the ability to attribute the positive change seen on these measures to PAT program services specifically.
4. As the quality of the relationship between the trained PAT home visitor and the family is an important factor for success, future research efforts may benefit from inclusion of a valid and reliable measure of the working alliance between providers and families.
5. Assessing impact of a program like PAT entails use of data outside of the specific program data collected by First Steps. Within South Carolina, the Revenue and Fiscal Affairs Office collects data across many state agencies where impact can be detected including social services, health services, and educational services, and oversees the process of application for and provision of this data to researchers. The research team experienced a number of barriers to obtaining the

correct data to support this evaluation. Thus, it is recommended that direct meetings occur between RFA and researchers at the inception of research/evaluation projects, and that detailed written project plans, with a timeline, are mutually established to assure on-time delivery of accurate data for analysis.

APPENDIX A: SCFS PROGRAM ACCOUNTABILITY STANDARDS

APPENDIX B: Parents As Teachers LOGIC MODEL

APPENDIX C: Parent and Child Level Data Availability



APPENDIX D: External Data Source Sample Sizes

Sample Sizes for Analyses Conducted with External (Non-SCFS) Data Sources

| | |
|---------------------------------------------------------------|--------------------------------------------------------------------------------------------------------|
| Treatment group: Data for 2,602 children from PAT families | Comparison group: Data for children from non-PAT families (sample size dependent on data source) |
|---------------------------------------------------------------|--------------------------------------------------------------------------------------------------------|

South Carolina Department of Education Data

| | |
|------------------------------------------------------------------|--------------------------------------------------------------------|
| Kindergarten Readiness Assessment (KRA) data for 215 children | Kindergarten Readiness Assessment (KRA) data for 1,188 children |
| School absenteeism data for 263 children | School absenteeism data for 1,143 children |

South Carolina Department of Social Services Data

| | |
|-----------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------|
| Child maltreatment report data for all 2,602 children; only 363 children involved in maltreatment reports | Child maltreatment report data for 10,616 children; only 1,643 children involved in maltreatment reports |
|-----------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------|

South Carolina Department of Health and Human Services Data

| | |
|---------------------------------------------------------------------------|---------------------------------------------------------------------------|
| Well-child visit data for Medicaid recipients including 2,163 children | Well-child visit data for Medicaid recipients including 7,364 children |
|---------------------------------------------------------------------------|---------------------------------------------------------------------------|