Re-Designing Community Mental Health Services for Urban Children:

Supporting Schooling to Promote Mental Health

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Abstract

Objective: This study examined a school- and home-based mental health service model, Links to Learning (L2L), implemented by community mental health providers (MHPs) and parent advocates in high poverty urban communities, and focused on empirical predictors of learning as primary goals for services. *Method*. Key opinion leader teachers and MHPs co-facilitated professional development sessions for classroom teachers on evidence-based programs for managing disruptive behavior to disseminate two universal (Good Behavior Game, Peer Assisted Learning) and two targeted (Good News Notes, Daily Report Card) programs. Group and home-based family education and support was delivered by MHPs and parent advocates for K-4th grade children diagnosed with disruptive behavior disorder. Services were Medicaid-funded by four agencies ($N = 17$ providers) in seven schools ($N = 136$ teachers, 171 children) in a two condition (L2L vs. services-as-usual; SAU) by six (pre- and post-tests for three years) longitudinal design with random assignment of schools to conditions. SAU consisted of supported referral to a nearby social service agency. *Results:* Mixed effects regression models indicated significant positive effects of L2L on mental health service use, observations of academic engagement, teacher report of academic competence and social skills, and parent report of social skills. Nonsignificant between-group effects were found on teacher and parent report of problem behaviors, daily hassles, and curriculum based measures. Moderation analyses indicated strongest effects for young children, girls, and those with less severe symptoms suggestive of early intervention effects. *Conclusions:* Community mental health services targeting empirical predictors of learning can improve academic performance and classroom behavior among children living in high poverty urban communities. *Keywords*: Mental health services, urban poverty, school-based mental health services, disruptive behavior disorder, key opinion leader

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Improving the accessibility and effectiveness of community mental health services for children has been a national concern for more than a decade (National Advisory Mental Health Council, 2001). In a seminal study, secondary data analysis of three nationally representative household surveys indicated that nearly 80% of low-income youth in need of mental health services did not receive services in the preceding 12 months, with rates approaching 90% for uninsured families (Kataoka, Zhang, & Wells, 2002). Lack of access to services is especially problematic in urban, low-income communities with high rates of nonattendance to initial appointments and rates below 10% for attendance at as few as four sessions (see McKay & Bannon, 2004). Infrequent use of mental health services has been attributed to mental health stigma (Dempster, Wildman, & Keating, 2013) and concrete obstacles, such as inaccessible locations, lack of information about services, and social isolation (Harrison, McKay, & Bannon, 2004). Concentrated urban poverty is also associated with high risk of substantial mental health difficulties (citation omitted). A longitudinal analysis of a large nationally representative sample of youth indicated a robust relation between neighborhood disadvantage and conduct problems over and above a series of family and individual risk factors (Goodnight, et al., 2012). Relatedly, exposure to community violence, affecting almost 80% of urban children (U.S. Department of Justice, 2003), is associated with poor academic performance (McCoy, Roy, & Sirkman, 2013) mediated by depression and disruptive behavior (Borofsky, Kellerman, Baucom, Oliver, & Margolin, 2013).

A public health framework offers promise for organizing the design and delivery of more accessible and appropriately targeted services to children living in urban poverty. Within a public

health framework, universal intervention strategies are deployed to attenuate risk factors and related behavior problems, while targeted interventions are simultaneously deployed for ihigh-risk cases (Stiffman, Stelk, Evans, & Atkins, 2010). If delivered in those contexts naturally inhabited by children and families – primarily school and home – and focused on specific aspects of those contexts affecting child learning and behavior, service models encompassing such interventions could also be more effective and sustainable (citation omitted). In this study, we examine a service delivery model, Links to Learning (L2L), which integrates universal and targeted interventions focused on supporting schooling for children with disruptive behavior disorders living in urban low-income communities.

School-Based Mental Health Services

Schools are the de facto providers of mental health services for U.S. children and youth (Farmer, Burns, Phillips, Angold, & Costello 2003; Green et al., 2013), providing an estimated 70% to 80% of psychosocial services to children (Rones & Hoagwood, 2000), usually in the form of individual counseling (Foster et al., 2005). However, counseling is largely ineffective for children with disruptive behavior disorders, which comprise the majority of school referrals (Farmer, Compton, Burns, & Robertson, 2002; Foster et al., 2005), and this appears especially evident for children attending schools in low-income urban communities. In a recent meta-analysis examining school-based mental health and behavioral programs for low-income, urban youth (Farahmand, Grant, Polo, Duffy, & DuBois, 2011), null effects were found for most outcome measures (mean ES = .08), and *negative effects* were found for programs directed at externalizing behaviors (ES = -.11). The authors suggested these findings reflect a lack of program attention to the many stressors apparent in low-income urban schools and proposed integration of the school ecology into program planning and implementation.

A second meta-analysis of programs based in community mental health settings serving low income urban youth (Farahmand et al., 2012), found positive effects for programs that supported parents or provided other community supports (mean ES = .38), and null effects for programs focused on direct services to youth (mean ES = .03). These findings suggest that individually focused services are contraindicated for low-income youth with disruptive behavior and that interventions are likely to be more impactful when they can be deployed in, and alter, family and community contexts (citation omitted). In this study, we implemented and examined a model by which community mental health staff worked directly with parents and teachers in low-income urban schools to enhance children's school success. Reconfiguring services in routine mental health settings also addresses the urgent need for clinically representative research that bridges science and practice (Weisz, Ng, & Bearman, 2014).

Predictors of Children's Learning: Teachers and Parents

Informed by evidence supporting the effectiveness of focusing mental health services on the empirical predictors of youth offending (Henggeler, Schoenwald, Borduin, Rowland, & Cunningham, 1998), we constructed a model to impact children's school success by focusing mental health services on the empirical predictors of children's learning (citation omitted). An extensive literature documents that children's academic learning is compromised in urban low-income schools, with profound and growing gaps between poor and nonpoor U.S. children (Reardon, 2011). This has important implications given that academic achievement is a hallmark of children's sense of competence (Masten & Curtis, 2000), and critical to social and emotional adjustment (Roeser, Eccles, & Freedman-Doan, 1999). Academic achievement can operate as a protective factor for urban children (Spencer, Cole, DuPree, & Glymph 1993), and is associated with positive relationships with peers, teachers, and parents, and reduced disruptive classroom

behavior (citation omitted). Finally, a direct focus on schooling by mental health providers could bridge communication between educational and mental health systems, and provide resources to struggling urban schools (Ringeisen, Henderson, & Hoagwood. 2003).

Reviews of the educational literature reveal the contribution that teachers and parents play in enhancing learning for elementary children. Specifically, three components of teacher practices most significantly impact children's learning: Effective instruction, classroom management, and teacher outreach to parents (Stringfield, 1994). Similarly, parent communication with teachers, homework support, and reading at home are associated with improved learning (Jeynes, 2005). Together, these classroom and family predictors of learning are the focus of a mental health service model developed for this study (citation omitted).

Diffusion of Innovation: Teacher Key Opinion Leaders and Parent Advocates

Diffusion theory posits that innovations are often initiated by key opinion leaders (KOLs) who serve as influential models for others in their social network (Rogers, 1995). In the first study applying diffusion theory to urban schools (citation omitted), KOL teachers, working in collaboration with mental health providers (MHPs), promoted higher rates of teachers' self-reported use of recommended strategies than consultation from MHPs without KOL support. These results supported an expanded role for KOL teachers as indigenous supports for the dissemination of school-based mental health interventions. Similarly, when parents with similar characteristics and experiences as the target population are involved in service delivery, their involvement can reduce stigma, enhance participation in services, and influence behavior change due to shared experiences, opportunities for natural empathy, and reduced social distance (citation omitted; Hoagwood et al., 2010).

The Current Study

The primary goal of this study was to examine the extent to which a mental health model, Links to Learning (L2L), focused on the key predictors of student learning, and delivered by community mental health providers aligned with KOL teachers and parent advocates, would lead to greater reductions in children's disruptive behavior at home and school compared to mental health services-as-usual (SAU). This three-year longitudinal study utilized a multi-method, multi-informant design consisting of classroom observations, teacher report, parent report, and direct assessment of academic performance with random assignment of schools to either L2L or referral to community based SAU. We also examined whether baseline levels of child and family characteristics moderated intervention effects.

Method

Setting

This study was conducted in collaboration with four community mental health agencies and seven public elementary schools in a large Midwestern city. University and school district IRB approval was obtained prior to initiating study procedures. Mental health agencies providing services to children in high-poverty urban communities were contacted and the first four that agreed to participate were enrolled. Two of the four agencies were large enough to have independent providers assigned to each study condition. The remaining two agencies provided services in either the L2L or SAU condition. In both conditions, providers billed through a fee-for-service model reimbursable by Medicaid.

Elementary schools ($N=325$) were screened on the following criteria to prioritize schools with greatest need and ensure comparability within and across conditions: (a) 85% or greater low income, (b) 85% or greater African American students, (c) average reading scores on statewide testing below the 35th percentile ($M = 27.9$, $SD = 3.8$), and (d) school population within one

standard deviation of the district mean ($M = 702$, $SD = 306$). The identified schools ($n = 58$) were further categorized by location within a three mile radius of participating mental health agencies to facilitate collaboration and minimize distance as a possible barrier to service use. From this list, six schools of similar size and proximity were randomly selected, three for each condition. No schools had preexisting relationships with participating agencies. Based on school district records, participating schools were characterized as 98% low income and 97% or greater African American. [One school withdrew from the L2L condition upon retirement of the principal after the first year of the study and was replaced by a school randomly selected from the same list used to select the original set of schools. In order to retain the same mental health agency in the study, the replacement school was selected from within three miles of the mental health agency, which was the same procedure used for the other schools.]

[Agencies in each condition made arrangements to reserve times for initial appointment for families who consented to participate in the study to allow research staff to facilitate enrollment in services.]

Sample and Recruiting Procedures

Children and families. Demographic characteristics of study participants are reported in Table 1 and the CONSORT flow diagram of subject recruitment and retention is presented in Figure 1. A total of 280 children and families enrolled in the study. Recruitment followed a modified multiple-gating procedure to maintain the confidentiality of families and minimize burden to teachers. First, consented teachers in grades K-4 completed the Systematic Screening for Behavior Disorders (SSBD; Walker & Severson, 1990), on ten students for whom they had concerns regarding externalizing behaviors. Second, as directed by the university IRB, names of nominated students were not released to the research team. Instead, teachers sent SSBD forms to

their school mental health team to determine if a referral was appropriate and to contact families

to inform them about the research. These procedures protected the identity of families not

interested in participating and more closely approximated real world referral process by schools

to mental health agencies. Third, interested families were referred by school mental health teams

to the investigators for consent.

Eligibility was determined by parent or teacher report on the DBD Rating Scale (Pelham,

Gnagy, Greenslade, & Milich, 1992) for one or more disruptive behavior disorder. [There were

no differences across conditions on the proportion enrolled ($\chi^2 < 1, p > .60$) or on child or parent

demographic variables or child diagnostic characteristics (all $ps > .05$).] Parents interested in

mental health services for their child but who declined participation were referred to a non-

participating nearby community mental health agency.

Over the course of the study, 81 children ($n = 44$ L2L; $n = 37$ SAU) discontinued data

collection and seven families ($n = 5$ L2L; $n = 2$ SAU) withdrew from the study. Child attrition

rates did not differ across conditions ($\chi^2 < 1, p > .40$), with 53% of L2L children ($n = 55$) and

31% of SAU children ($n = 28$) participating until the conclusion of the study (3 years, 6 time

points). [In the L2L condition, 28% of subjects (n = 29 of 104) were enrolled after the first year

to maintain providers' caseloads, whereas in the SAU condition, enrollment was discontinued

following the first year given school staff's reluctance to refer families to SAU due to high rates

of non-attendance associated with long waiting lists at agencies, and clinician turnover.

However, participants already enrolled in the SAU condition (n = 57) were followed for the

duration of the study.]

Teachers. A total of 136 teachers participated in the study ($n = 71$ L2L, $n = 65$ SAU).

Consent rates were 89% for L2L and 93% for SAU teachers. There were no significant

differences across condition on demographic variables with the exception that SAU teachers had

fewer years of teaching experience (χ^2 (1, N =136) = 10.906; $p < .001$). Teachers were

predominantly female (89%) and African American (58%), with an average of 12 years of

experience. Teacher attrition did not differ across conditions, ($\chi^2 < 1$, $p > .38$), with 69% of L2L

teachers ($n = 49$) and 54% of SAU teachers ($n = 35$) participating until study conclusion.

Nineteen teachers chose to not contribute child data, resulting in an analytic sample of 117

teachers (L2L $n = 60$, SAU $n = 57$).

Experimental Condition: Links to Learning (L2L)

The L2L service model focused on empirical predictors of student learning and was

delivered in classrooms and homes by community mental health providers aligned with KOL

teachers and parent advocates.

Key opinion leader teachers (KOLs). KOLs ($N = 10$) were identified via sociometric

interviews with instructional staff ($n=141$, 94% interview participation) at each school through

procedures described in prior studies (citation omitted). Six teachers identified as KOLs declined

to participate in this role, citing workload concerns, although they did agree to participate in the

study as classroom teachers. The sociometric procedure identified the pair of eligible teachers

who together were aligned with the most K-5th grade teachers at that school. When an eligible

teacher declined, a new pair of teachers was identified who together were linked to the most

teachers at their school. All participating KOLs remained in this role throughout the study.

Ninety percent of KOLs were female, 50% earned Master's Degrees, 50% earned Bachelor's

degrees, mean age = 43.14 ($SD = 14.41$), and mean years of experience = 23.8 ($SD =11$).

Agency teams. Community mental health agency teams consisted of licensed mental

health providers (MHPs) paired with parent advocates employed by the agency and referred to as

family resource developers (FRDs). Seventeen individuals consented to participate ($n = 11$

MHPs and $n = 6$ FRDs). Providers were predominantly female ($n = 8$ MHPs and $n = 5$ FRDs)

and had practiced on average 5.7 years ($SD = 3.96$; range: $2 - 16$ years). Three MHPs had

master's degrees in social work, five had a bachelor's degree, and one had an associate's degree.

Two FRDs had a bachelor's degree, and the remaining four had high school diplomas or the

equivalent. Information on race was available for all FRDs ($n = 6$ African American) and 10 of

11 MHPs ($n = 5$ African American; $n = 4$ European American; $n = 1$ multiracial). Mean age of

MHPs was 32.5 years ($SD = 8.73$). Six providers withdrew from the study, four when their

employment with the agency ended, and two citing workload concerns.

Classroom intervention. Two universal (Good Behavior Game and Peer-Assisted

Learning) and two targeted interventions (Daily Report Card and Good News Notes) were

selected based on empirical evidence of their impact on key predictors of learning, and their

endorsement by KOL teachers. Implementation of the targeted interventions was supported by

case-centered consultation through conjoint parent and teacher meetings (Sheridan &

Kratochwill, 2007), facilitated by MHPs and FRDs.

Good Behavior Game (GBG), is a contingency-based behavior management system

grounded in reinforcement theory and widely used in schools for decades (see Embry, 2002;

Flower, McKenna, Bunuan, Muething, & Vega, 2014), in which teams of students lose points

from a bank for each rule violation (Barrish, Saunders, & Wolf, 1969). Peer-Assisted Learning

(PALS), is a paired reading strategy that maximizes opportunities for learning and minimizes

stigma associated with instructional deficits in which the tutor and tutee follow systematic steps

for reading practice with feedback (Fuchs, Fuchs, & Burish, 2000). The Daily Report Card

(DRC) is a targeted intervention in which teachers and parents jointly identify, monitor, and

reinforce three to five individualized behaviors that interfere with learning (Kelley & McCain, 1995). Good News Notes (GNN) are certificates that reinforce desired behaviors (e.g., rule following, work completion) through positive weekly feedback to families (Lahey et al., 1977).

Family intervention. The family intervention was manualized and derived from the empirical literature on parental support of academic learning (Sheridan & Kratochwill, 2007). The intervention was group-delivered weekly at each school for 8 weeks by MHPs and FRDs or individually via home visits for parents unable to attend groups. The intervention targeted home-school communication, home routines that support learning, homework support, and daily reading (Patall, Cooper & Robinson, 2008; Serpell, Sonnenschein, Baker, & Gannapathy, 2002). Individualized case management services also were provided as needed.

Training and supervision. KOLs earned university graduate credit for participating in a web-based course, designed and taught by our research team, to learn the classroom and family interventions. MHPs also participated in the web-based course, which was asynchronous to facilitate participation at times convenient for KOLs and MHPs. MHPs also attended separate trainings with FRDs on the family intervention (two days) and case consultation (two days). Weekly two-hour supervision sessions, co-led by agency supervisors and university consultants for MHP-FRD teams, focused on reviewing student progress, problem-solving barriers to intervention implementation, and facilitating fidelity to the interventions (citation omitted). Supervision and field based training was used to train new agency providers in the classroom and family intervention and also served as booster training for existing teams.

All KOLs ($n = 10$) and nine of eleven MHPs successfully completed the web-based course, and seven MHPs and four FRDs completed the additional four days of training on case consultation (two days) and the family intervention (two days). Agency supervision was offered

weekly as planned ($M = 1.31$ times per week), for between 10 and 180 minutes ($M = 81.05$, $SD = 36.36$) for MHP and FRDs. MHPs attended 72% of sessions, agency supervisors attended 90% of sessions, and FRDs attended 43% of sessions (citation omitted).

Diffusion of the Classroom Intervention. KOLs hosted weekly, one or two hour meetings for their teacher colleagues, approved by their school's principal and the school district for professional development credit, to introduce and endorse the universal and targeted strategies covered in the web-based course. Meetings were offered during the spring of the first year of participation, before and after school hours, with MHPs attending in a supportive role. Teachers received $100 for participating in eight or more meetings and KOLs were paid $250 per semester for leading the meetings. Meetings were followed by classroom demonstrations of universal and targeted interventions by KOLs and/or university consultants, supported by MHPs and FRDs. Booster training was provided by KOLs and MHPs with university consultants in a supportive role for teachers new to the school and teachers in need of additional support.

Comparison Condition: Services as Usual (SAU)

Families were referred to a participating community mental health agency for mental health services by licensed providers with no restrictions on type or frequency of services.

<div align="center">Measures</div>

Fidelity Monitoring.

Fidelity measures were developed to examine adherence to core components of the service model. Parents completed a 31-item checklist twice annually assessing the frequency and quality of support received on homework routines, home-school communication, and reading. Agency staff completed an 18-item checklist monthly on the structure and content of supervision. Teachers completed two scales monthly: a 31-item checklist assessing frequency

and quality of support from KOLs and mental health teams and a calendar to record use of

recommended interventions. Information on scale development and psychometric properties

of fidelity measures is described separately (citation omitted).

Professional development meetings. Attendance records revealed that KOLs hosted

professional development meetings as planned. The number of meetings ranged across schools

from 4 to 10 ($M = 7.00$, $SD = 2.58$), lasting 1 hour weekly for three months in three schools, and

2 hours weekly for one month in one school. Forty-seven teachers were enrolled in L2L when

professional development meetings began, and four additional teachers attended the meetings

before they enrolled in the study. Meetings were well-attended, with 78% of participating

teachers ($n = 40$ of 51) attending at least one meeting, and 63% of teachers attending more than

half (range = 0.63 to 1.00, $M = 0.83$, $SD = 0.13$). Twenty teachers enrolled in L2L after the

professional development meetings had concluded. They received introduction to the

recommended strategies through individual meetings with KOLs.

Classroom Teachers. Seventy-five percent of teachers ($n = 53$) submitted fidelity

checklists of KOL classroom support (n = 128 checklists collected over 6 time points). Of those

teachers who completed surveys, 83% ($n = 44$) reported that a KOL teacher visited their

classrooms at least a few times, and 68% ($n = 36$) reported many times; 81% teachers ($n = 43$)

reported KOLs met with them at least a few times outside of class time, 45% ($n = 24$) reported

many times; and 89% teachers ($n = 47$) reported KOLs offered them general support at least a

few times, 77% ($n = 41$) reported many times. Eighty-three percent of teachers (n= 59) submitted

monthly fidelity calendars during the course of the study. Calendars revealed that teachers used

strategies recommended by KOLs at a high rate, with more frequent use of universal strategies

(Good Behavior Game: 80%; Peer Assisted Learning: 76%) than targeted strategies (Daily

Report Card: 56%; Good News Notes: 53%).

Parents. Sixty percent of parents (n = 62) submitted at least one fidelity checklist over

the course of the study, to provide an assessment of home support received from the mental

health agency team. Of those parents who completed surveys, 82% (n = 51) reported that they

spoke with their MHP or FRD (by phone or at school) at least a few times, 47% parents (n = 29)

reported many times; 40% parents (n = 25) reported receiving a home visit at least a few times,

18% parents (n = 11) reported many times.

Service Use

Based on review of agency records across both conditions, service use was computed as

the average number of service minutes per day per time point billed to Medicaid, including direct

services to children and families and teacher consultation. Distribution of billing across

categories is available upon request.

Child Behavior at Home and School

Behavioral Observation of Students in Schools (BOSS; Shapiro, 2004) is a

standardized classroom observation system that includes three off-task behaviors (motor, verbal,

passive) averaged to form a total off task score (BOSS Off Task), and two student engagement

behaviors (active, passive) summed to form a total engagement score (BOSS Engagement). [As

per standardized procedures, two 15-minute observations of target students (sixty 15-second

intervals) were conducted on consecutive days twice annually for each time point to generate two

types of data]: (1) scores of target students based on forty-eight 15-second observations; and (2)

scores of randomly selected peers, in the same classroom as the target student and matched for

gender, based on twelve 15-second observations; these randomly selected peers are called the

Peer Comparison (PC). Observers choose the PC by rotating to a different peer every fifth interval, therefore observing up to twelve peers in a given observation (and up to twenty-four peers across the two observations in a given classroom per time point). PC data allow a comparison of each target student's data to pooled data of normative peers within their classroom.] Observers were blind to condition and trained to a minimum of 80% inter-observer agreement. BOSS observations were discontinued in SAU schools after the first year due to a combination of resource constraints and concerns by teachers regarding the amount of time observers were spending in their classrooms in the absence of mental health services.

Social Skills Rating System (SSRS; Gresham & Elliott, 1990) was completed by parents and teachers to assess social skills and problem behaviors and by teachers to assess academic competence on a 3-point scale. Year 1 baseline internal reliability for Social Skills, Problem Behaviors, and Academic Competence (teachers) were $\alpha = .85$, $\alpha = .86$, and $\alpha = .93$, respectively, and for Social Skills and Problem Behaviors (parent) were $\alpha = .87$, $\alpha = .86$ respectively. Social Skills and Problem Behaviors were examined as outcome variables and Academic Competence as a moderator.

Strengths and Difficulties Questionnaire (SDQ; Goodman, 2001) assesses child distress, social impairment, burden, and chronicity. The SDQ Impact Score, examined as a moderator, reflects overall distress and social impairment ranging from 0-10 (parent report) and 0-6 (teacher report). Year 1 baseline internal reliability for the impact score was $\alpha = .76$ (parent) and $\alpha = .56$ (teacher).

Parent Hassles Scale (DeLongis, Folkman, & Lazarus, 1988), examined as a moderator, assesses parent perception of severity of daily hassles on a 4-point scale. Internal reliability of baseline scores was high ($\alpha = .94$).

Academic Performance

      Curriculum-based measures (CBM; Shapiro, 2004) are standardized reading probes (see www.aimsweb.com) individually administered in fall, winter, and spring. A reading ability score (number read correctly per minute) was computed to yield a percentage correct score. Observers were trained on standardized master-coded DVDs to a criterion of 80% agreement. Reliability was assessed yearly on 15% of administrations to 80% criterion.

      Academic Competence Evaluation Scales (ACES; DiPerna & Elliot, 1999). Teachers completed the 30 items rated on a 5-point scale measuring perceptions of student engagement, motivation, and study skills. Baseline internal reliability was high (α = .96).

      Homework Problem Checklist (HPC; Anesko, Schoiock, Ramirez, & Levine, 1987) provides 20 homework concerns rated by parents on a 4-point scale. Baseline internal reliability was high (α= .92).

Covariates

      Covariates included gender, grade at baseline, and baseline scores on the following:

      Classroom Assessment Scoring System (CLASS; Pianta, La Paro, & Hamre, 2008) is an observational measure of classroom behavior with nine dimension scores totaled for an overall score. Observers participated in 2-day trainings by CLASS developers. Reliability was assessed annually from master-coded DVDs to 80% criterion.

      Teacher Sense of Efficacy Scale (TSES; Tschannen-Moran & Hoy, 2001) is 12 items assessing teacher control over classroom circumstances (1 = *No Control* to 9 = *A Great Deal).* Baseline total score internal reliability was high (α = .93).

Organizational Health Inventory - Elementary (OHI-E; Hoy & Woolfolk, 1993) is 37 items assessing teachers' perceptions of organizational school health (1 = *Rarely* to 4 = *Very Frequent*) summed to a total score. Baseline internal reliability was high (α = .95).

Quality of Teacher Work Life Survey (QTWLS; Pelsma, Richard, Harrington, & Burry, 1989) is 36 items assessing teacher stress (1 = *None*; 4 = *Extreme*) and satisfaction (1 = *Very Dissatisfied*; 4 = *Very Satisfied*) summed to a total score. Internal reliability of baseline scores was high (α = .96).

Data Analysis

Three-level mixed-effects regression models (MRM; Hedeker & Gibbons, 2006) were used to examine condition effects (i.e., L2L vs. SAU) on child outcomes, and moderation of effects by baseline covariates. To assess effects over time, scores were coded for the number of months children were in classrooms of teachers' who received the L2L professional development training, to account for within year transfers, long-term substitute teachers, and teacher changes across grades. For all models, child-specific covariates (grade, gender) were entered at the child level, and teacher and classroom level covariates (CLASS, TSES, OHI-E, QTWLS) were entered at the classroom level. Significant covariates were retained in the final models. Model parameters were estimated using maximum marginal likelihood. Condition effects over time were estimated by the group X time interaction parameter. For outcome variables for which teacher-level random effects were not observed, two-level rather than three-level MRMs were computed. All MRMs were performed using Proc Mixed in SAS 9.2.Intent-to-treat analyses included a maximum of six measurement occasions for each of ten outcomes for 171 children in 117 classrooms in two conditions (L2L, SAU). Beginning with baseline assessment (T1), these occasions took place in the fall and spring of each academic year.

Missing Data

[Missing data occurred mainly for three reasons: (1) the child enrolled in the study following baseline assessment (T1); (2) an enrolled child was absent on a scheduled assessment occasion or a particular instrument was not completed during the assessment; (3) the child moved to a different school, or was withdrawn from the study by parents, or the school withdrew from the study. Data missing due to reasons 1 and 2 occurred mainly at the beginning of the study, with data missing due to reason 3 occurring mainly after the fourth assessment (T4).]

Imputation. For each variable with data missing, the number of measurement occasions with available data determined the maximum number of measurement occasions for which values were imputed (Hedeker & Gibbons, 1997). [However, values were not imputed if they would have accounted for 50% or more of the data for a particular variable. For example, because BOSS was discontinued in the SAU condition after Year 1 (see Measures), BOSS data were not imputed beyond Year 1 for these children. Three methods were used to impute values for missing data, each pertaining to a different reason for missingness. For data missing due to reason 1, the season specific mean was used; for reason 2, the child-specific mean was used; for reason 3, the last observation carried forward (LOCF) was used. LOCF is widely used because the underlying implementation procedure is simple, as is its interpretation (Little & Rubin, 1987.] For teacher-level missing data, the teacher-specific mean was imputed.

Results

Intent-to-Treat Analyses

Mental health service use. L2L children were significantly more likely than SAU children to enter into mental health services; 72.1% of L2L children (75 of 104) and 28.4% of SAU children (19 of 67) entered services, $\chi^2 = 9.96$, $p < .001$. Service use rates over time also

differed by condition. Among L2L children who received services, 52% (39 of 75) received

services until the conclusion of the study, compared to 15.8% ($n = 3$ of 19) of children in the

SAU condition $Z(1, N = 94) = 2.83$, $p < .01$. [Of 36 L2L children who discontinued services,

two-thirds either transferred schools ($n = 17$) or attended the school that withdrew from the

study ($n = 6$). Of those remaining in the participating schools ($n = 52$), 75% (39 of 52)

remained in services; 21.1% did not complete data ($n = 11$), and 1% withdrew before the

end of the study ($n = 2$). Of the 16 SAU children who discontinued services, 44%

transferred schools ($n = 7$). This left 12 children available to continue services and of these

25% ($n = 3$) remained in services. There were significant condition effects favoring L2L in

the proportion of available children who remained in services $Z(1, N = 64) = 3.29$, $p < .001$.]

There also was a significant difference in parent attendance at sessions across conditions. Of

families who received services, parents in the L2L condition attended an average of 4.32 sessions

per three-month period ($SD = 4.35$, range $= 0.2$ to 24.67), as compared to 2.02 sessions ($SD =$

2.11, range $= 0.17$ to 8.50) for parents in the SAU condition, $t(92) = 2.23$; $p < .05$ (ES $= .71$).

Behavioral outcomes. Tables 2 and 3 present descriptive statistics for child outcomes,

and results from mixed effects models on behavioral outcomes including significant baseline

covariates, respectively. The significant time by condition interaction for SSRS Social Skills

indicates that L2L parents and teachers reported greater improvement in children's social skills

over time relative to SAU parents, $t(628) = 2.28$; $p < .05$, and teachers, $t(296) = 2.14$; $p < .05$.

[On BOSS observations of off-task behavior, there was no SAU vs. L2L condition by

time effect during Year 1. However, relative to peer comparisons (PC), L2L children

demonstrated more off task behavior at baseline, $t(742) = 10.65$, $p < .001$, as expected, but

showed larger decreases across three years, $t(742) = -2.82$, $p < .01$), controlling for gender. On

BOSS academic engagement scores, L2L children, relative to SAU children, demonstrated significantly lower baseline scores, $t(160) = -2.73$, $p = .01$, and a steeper increase between time 1 and time 2, $t(132) = 3.04$, $p < .01$, ES= .60 (not shown in table). This significant between-group difference in slope over time is displayed in Figure 2A. In addition, as displayed in Figure 2B, L2L children again demonstrated expected lower BOSS academic engagement scores at baseline relative to PC, $t(740) = -6.96$, $p < .001$), and a greater rate of change over time controlling for grade and TSES, $t(740) = 3.27$, $p < .01$.] There was no significant condition by time effect for SSRS Problem Behaviors (Teacher or Parent) or SDQ (Teacher or Parent).

Academic outcomes. Table 4 presents findings from the three-level mixed effects models on teacher ratings of academic performance including significant baseline covariates. For ACES scores, there was a significant difference at baseline between L2L and SAU children, $t(296) = -2.87$, $p < .01$, and a condition by time interaction favoring the L2L group, $t(296) = 2.432$, $p < .05$, indicating a greater improvement over time. [However, L2L scores at the last time point remained lower than SAU scores (see Table 2).] There were no condition differences on the Homework Problems Checklist or CBM reading fluency.

Moderation Analyses

Table 5 presents the results of MRMs examining moderation of condition by time effects by grade, gender, parent hassles, child impairment (SDQ Parent Impact Scale, SDQ Teacher Impact Scale), and child academic competence (SSRS Teacher Report). Separate models were computed for each outcome with significant intervention by time effects (i.e., ACES, SSRS Social Skills Parent, BOSS Engagement, and BOSS Off Task).

Modeling teacher report of children's baseline symptom severity as a continuous moderator variable, there was a significant three-way interaction between baseline symptom

severity, condition, and time such that teachers reported greater improvement in academic competence for L2L children identified as less impaired, $t(275) = -2.79$, $p < .01$. Modeling parent experience of hassles as a continuous variable, parents of L2L children who reported more hassles also reported less improvement over time in their child's social skills when compared to parents of L2L children who reported fewer hassles, $t(615) = -2.96$, $p < .01$.

Significant moderation of effects by gender was found for SSRS Social Skills (parent) and BOSS academic engagement scores. Specifically, parents of L2L girls reported greater improvement over time in social skills than parents of L2L boys, $t(628) = 2.05$, $p < .05$, with post hoc analyses indicating that both L2L girls and boys demonstrated significant improvement, $t(628) = 2.68$, $p < .01$ and $t(628) = 3.85$, $p < .0001$, respectively. L2L girls also demonstrated greater improvement than L2L boys in academic engagement between time 1 and time 2, $t(114) = 2.55$, $p < .05$. L2L children in lower baseline grades (K-2) demonstrated greater improvement in teacher report of academic competence (ACES) and social skills (SSRS), than L2L children in higher baseline grades [(3rd-4th], $t(573) = -4.63$, $p < .0001$ and $t(294)$ -2.33, $p < .05$ respectively. Moderation scores for the SDQ Parent Impact Scale, Hassles Scale, Boss Off Task, and SSRS Academic Competence were not significant for any outcomes.

Discussion

This study is part of a broader program of research focused on re-designing mental health services to support children's learning within communities of concentrated urban poverty (citation omitted). Based on empirical evidence indicating that schooling is a critical component of children's mental health, we hypothesized that community mental health services directly targeting the empirical predictors of children's learning would lead to improved behavior at home and school compared to mental health services as usual. In a longitudinal two-group design

with matched schools randomly assigned to conditions, this hypothesis was largely supported.

Robust effects on service use favoring L2L replicated those found in a prior study

indicating that families in high poverty urban communities prefer school-based over clinic-based

mental health services, evidenced by higher service initiation and retention (citation omitted). In

the current study, these differences were large and enduring, with more than one half of L2L

families receiving services for up to three years. Of families who remained in their school and

available for services, 75% elected to continue them. For those families who received mental

health services, parent attendance at sessions was twice as high for L2L vs. SAU. In L2L,

services were provided in the primary contexts for learning and behavior -- classrooms and

homes -- rather than in mental health clinics, and focused directly on helping teachers and

parents to support child learning, thereby minimizing concrete barriers such as transportation and

childcare. Because mental health services were reimbursed by Medicaid fee-for-service billing,

these results suggest that re-designing mental health services to support children's learning

increased the access, effectiveness, and sustainability of services in these high poverty

communities.

Second, results supported the hypothesis that leveraging mental health services to support

children's learning resulted in improved behavior. Specifically, L2L children demonstrated

greater increases in academic engagement than SAU children in Year 1 ($d = .60$), and relative to

normative peers across three years ($d = .32$), along with greater decreases in off task behavior ($d = .53$) relative to normative peers. Moderate to large effect sizes for academic engagement for

L2L compared to SAU after only one year of services is encouraging given evidence for the

protective effect of academic engagement for children in urban poverty (Spencer et al., 1993).

Third, relative to SAU, L2L was associated with small but significant increases in teacher-rated academic competence ($d = .29$), and social skills rated by teachers ($d = .24$), and parents ($d = .27$), particularly for children in lower grades and those with less severe impairment. Thus, L2L may be best considered as an early intervention model, consistent with research on several of its intervention components (e.g., Embry, 2002; Ginsburg-Block, Rohrbeck, & Fantuzzo, 2006). In addition, despite evidence for limited benefits of school-based interventions for children living in urban poverty (Farahmand et al., 2011), these effect sizes were equal to or greater than evidence-based treatments for ethnic minority youth (mean $ES = .22$ compared to SAU; Huey & Polo, 2008), for a CBT intervention for disadvantaged youth (mean $ES = .31$ compared to wait-list controls; Liber, De Boo, Huizenga, & Prins, 2013), and for the three year evaluation of the Fast Track intervention for children at risk for conduct problems (mean $ES = .19$ compared to no-treatment controls; Conduct Problems Prevention Research Group, 2002).

However, despite improved on-task behavior and teacher reported academic competence for children in the L2L condition, reading fluency did not improve [and academic competence for L2L children remained below SAU means]. This suggests that aligning mental health services to support learning affected proximal (i.e., engagement) but not distal (i.e., achievement) outcomes. Perhaps to impact reading directly, future iterations of the service model need to incorporate curriculum modifications and differentiated instructional approaches, especially when a child's instructional level deviates significantly from their grade level (Garat et al., 2008). These could be incorporated into KOL-led professional development meetings, which appeared to be an important component of the service delivery model by promoting collaborative relationships between MHPs and teachers and strengthen MHPs familiarity with effective educational practices. This, in turn, facilitated MHPs capacity to help teachers adapt instruction

to the unique needs of children - a new role for MHPs and potentially a powerful support to teachers, children, and parents.

Results from moderation analyses specify nuanced impacts of the L2L service model, specifically that level of behavioral difficulty and family stress moderated effects. This suggests the need for more intensive services for behavior-disordered children, which, as noted in a recent review, is a high priority for research and practice (Harrison, Bunford, Evans, & Owens, 2013). Thus, similar to the possible need for academic supports, future iterations of this model could incorporate more intensive family support for a subset of high needs families (e.g., Dagenais, Begin, Bouchard, & Fortin, 2004). Because the universal and targeted interventions of L2L comprise the first two tiers of a public health model, adding a layer of more intensive services to this framework could facilitate greater gains and wider reach for children and families than delivering services independently, thereby (Stiffman et al., 2010).

Finally, these findings have implications for health care reform in an era of universal mental health coverage. As noted by Mechanic (2012), the Affordable Care Act provides many opportunities to refine service models to align more directly with important outcomes and to improve access to high quality prevention and intervention services. We suggest that the findings in this study support not only a direct focus on children's learning as a realistic goal of mental health services, but also the development of novel teams to support mental health service delivery. In our study, classroom teachers and community parents each made important contributions to the service model. Furthermore, although L2L was funded through fee-for-service Medicaid billing, alternative funding mechanisms such as capitated care models that fund outcomes not services, could have facilitated even greater collaboration among members of the service team (i.e., school staff, mental health providers, parent advocates).

Limitations and Future Directions

The study had a number of limitations. First, classroom observational data were not collected in the SAU condition beyond the first year due to resource limitations and concerns expressed by teachers regarding the amount of time observers were spending in their classrooms. In the absence of intervention, there was no recourse but to withdraw observers. Although classroom peer comparison data provided evidence that L2L children were approaching normative peer behavior, future research that includes longitudinal observational data between targeted groups would strengthen findings. Second, because the intervention was designed to last several years, we were unable to conduct follow-up assessments to determine long-term outcomes. Third, although schools and agencies were similar in composition and structure, there were too few schools or agencies to examine setting-level effects including the extent to which organizational social context impacted outcomes (Aarons, Hurlburt, & Horwitz, 2011). Replication in a larger number of schools and agencies is therefore an important additional step in the research. Nevertheless, despite these limitations, this remains the largest and longest study of urban children's mental health service use and school performance to date and suggests that this model is both feasible and effective compared to SAU.

In summary, the L2L service model redesigned services provided by community mental health providers to support learning and behavior among urban low-income children. Consistent with diffusion theory, the model leveraged the influence of key opinion leader teachers and influential parents to support intervention implementation by teachers and parents. Results suggest that aligning community mental health resources with school goals and directly targeting key empirical home and school predictors of learning, can improve outcomes for referred children with DBDs living in high poverty urban communities.

References

Aarons, G. A., Hurlburt, M., & Horwitz, S. M. (2011). Advancing a conceptual model of

    evidence-based practice implementation in public service sectors. *Administration and*

    Policy in Mental Health and Mental Health Services Research, 38, 4-23.

Anesko, K., Schoiock, G., Ramirez, R., & Levine, F. (1987). The homework problem checklist:

    Assessing children's homework difficulties. *Behavioral Assessment, 9*, 179-185.

Barrish, H., Saunders, M., & Wolf, M. (1969). Good behavior game: Effects of individual

    contingencies for group consequences on disruptive behavior in a classroom. *Journal of*

    Applied Behavior Analysis, 2, 119-124.

Borofsky, L., Kellerman, I., Baucom, B., Oliver, P., & Margolin, G. (2013). Community

    violence exposure and adolescents' school engagement and academic achievement over

    time. *Psychology of Violence, 3*, 381.

Conduct Problems Prevention Research Group (2002). Evaluation of the first 3 years of the Fast

    Track prevention trial with children at high risk for adolescent conduct problems. *Journal*

    of Abnormal Child Psychology, 30, 19-35.

Dagenais, C., Begin, J., Bouchard, C., & Fortin, D. (2004). Impact of intensive family support

    programs: A synthesis of evaluation studies. *Children and Youth Services Review, 26,*

    249-263.

DeLongis, A., Folkman, S., & Lazarus, R. (1988). The impact of daily stress on health and

    mood: Psychological and social resources as mediators. *Journal of Personality and Social*

    Psychology, 54, 486-495.

Dempster, R., Wildman, B., & Keating, A. (2013). The role of stigma in parental help-seeking

    for child behavior problems. *Journal of Clinical Child and Adolescent Psychology, 42*,

56-67.

DiPerna, J. C., & Elliott, S. N. (1999). Development and validation of the academic competence

evaluation scales. *Journal of Psychoeducational Assessment, 17*, 207-225.

Embry, D. D, (2002). The good behavior game: A best practice candidate as a universal

behavioral vaccine. *Clinical Child and Family Psychology Review, 5,* 273-297.

Farahmand, F., Duffy, S., Tailor, M., DuBois, D., Lyon, A., Grant, K . . . & Nathanson, A.

(2012). Community-based mental health and behavioral programs for low-income, urban

youth: A meta-analytic review. *Clinical Psychology: Science and Practice, 19,* 195-215.

Farahmand, F., Grant, K., Polo, A., Duffy, S., & DuBois, D.. (2011). School-based mental health

and behavioral programs for low-income, urban youth: A systematic and meta-analytic

review. *Clinical Psychology: Science and Practice, 18,* 372-390.

Farmer, E., Burns, B., Phillips, S., Angold, A., & Costello, E. (2003). Pathways into and through

mental health services for children and adolescents. *Psychiatric Services, 54*, 60-66.

Farmer, E., Compton, S., Burns, B., & Robertson, E. (2002). Review of the evidence for

treatment of childhood psychopathology: Externalizing disorders. *Journal of Consulting

and Clinical Psychology, 70,* 1267-1302.

Flower, A., McKenna, J., Bunuan, R., Muething, C., & Vega, R. (2014). Effects of the Good

Behavior Game on challenging behaviors in school settings. *Review of Educational

Research*, published online, doi:10.3102/0034654314536781.

Foster, S., Rollefson, M., Doksum, T., Noonan, D., Robinson, G., & Teich, J. (2005). *School

mental health services in the United States, 2002–2003*. DHHS Pub. No. (SMA) 05-4068.

Rockville, MD: Substance Abuse and Mental Health Services Administration.

Fuchs, D., Fuchs, L., & Burish, P. (2000). Peer-assisted learning strategies: An evidence-based

practice to promote reading achievement. *Learning Disabilities Research & Practice, 15*, 85-91.

Garat, M., Cronen, S., Eaton, M., Kurki, A., Ludwig, M, Jones, W. . . .Sztejnberg, L. (2008). *The impact of two professional development interventions on early reading instruction and achievement* (NCEE 2008-4030). Washington, DC: Institute of Education Sciences.

Ginsburg-Block, M., Rohrbeck, C., & Fantuzzo, J. (2006). A meta-analytic review of social, self-concept, and behavioral outcomes of peer assisted learning. *Journal of Educational Psychology, 98,* 732-749.

Goodman, R. (2001). Psychometric properties of the Strengths and Difficulties Questionnaire. *Journal of the American Academy of Child & Adolescent Psychiatry, 40*, 1337-1345.

Goodnight, J., Lahey, B., Van Hulle, C., Rodgers, J., Rathouz, P., Waldman, I., & D'Onofrio, B. (2012). A quasi-experimental analysis of the influence of neighborhood disadvantage on child and adolescent conduct problems. *Journal of Abnormal Psychology, 121,* 95-108.

Green, J., McLaughlin, K., Alegria, M., Costello, E., Gruber, M., Hoagwood, K., . . . & Kessler, R. (2013). School mental health resources and adolescent mental health service use. *Journal of the American Academy of Child & Adolescent Psychiatry, 52,* 501-510.

Gresham, F. M., & Elliott, S. N. (1990). *The Social Skills Rating System.* Circle Pines, MN: American Guidance Service.

Harrison, J. R., Bunford, N. Evans, S. W., & Owens, J. S. (2013). Educational accommodations for students with behavioral challenges: A systematic review of the literature. *Review of Educational Research, 83,* 551-597.

Harrison, M. E., McKay, M. M., & Bannon, Jr., W. M. (2004). Inner-city child mental health service use: The real question is why youth and families do not use services. *Community*

Mental Health Journal, 40, 119-131.

Hedeker, D., & Gibbons, R. D. (1997). Application of random-effects pattern-mixture models for

missing data in longitudinal designs. *Psychological Methods, 2,* 64-78.

Hedeker, D., & Gibbons, R. D. (2006). *Longitudinal data analysis*. Hoboken, NJ: Wiley.

Henggeler, S., Schoenwald, S., Borduin, C., Rowland, M., & Cunningham, P. (1998).

Multisystemic treatment of antisocial behavior in children and adolescents. NY:

Guilford.

Hoagwood, K., Cavaleri, M., Olin, S., Burns, B., Slaton, E., Gruttadaro, D., & Hughes, R.

(2010). Family support in children's mental health: A review and synthesis. *Clinical

Child and Family Psychology Review, 13*, 1–45.

Hoy, W. K., & Woolfolk, A. E. (1993). Teachers' sense of efficacy and the organizational health

of schools. *The Elementary School Journal, 93*, 355-372.

Huey, S. J., & Polo, A. J. (2008). Evidence-based psychosocial treatments for ethnic minority

youth. *Journal of Clinical Child & Adolescent Psychology, 37,* 262-301.

Jeynes, W. H. (2005). A meta-analysis of the relation of parental involvement to urban

elementary school student academic achievement. *Urban Education, 40*, 237-269.

Kataoka, S., Zhang, L., & Wells, K. (2002). Unmet need for mental health care among U.S.

children: Variation by ethnicity and insurance status. *American Journal of

Psychiatry, 159*, 1548-1555.

Kelley, M. L., & McCain, A. (1995). Promoting academic performance in inattentive children:

Behavior Modification, 19, 357-375.

Lahey, B. B., Gendrich, J. G., Gendrich, S. I., Schnelle, J. F., Gant, D. S., & McNees, M. P.

(1977). An evaluation of daily report cards with minimal teacher and parent contacts as an

efficient method of classroom intervention. *Behavior Modification, 1*, 381-394.

Liber, J., De Boo, G., Huizenga, H., & Prins, P., (2013). School-based intervention for childhood

  disruptive behavior in disadvantaged settings: A randomized controlled trial with and

  without active teacher support. *Journal of Consulting and Clinical Psychology, 81,* 975-

  987.

Little, R. J. & Rubin, D. B. (1987). *Statistical analysis with missing data*. New York: Wiley.

Masten, A., & Curtis, W. (2000). Integrating competence and psychopathology: Pathways

  toward a comprehensive science of adaptation in development. *Development and*

  Psychopathology, 12, 529-550.

Mechanic, D. (2012). Seizing opportunities under the Affordable Care Act for transforming the

  mental health and behavioral health system. *Health Affairs, 31,* 376-382.

McCoy, D. C., Roy, A. L., & Sirkman, G. M. (2013). Neighborhood crime and school climate as

  predictors of elementary school academic quality: A cross-lagged panel

  analysis. *American Journal of Community Psychology*, *52,* 128-140.

McKay, M. M., & Bannon, W. M. (2004). Engaging families in child mental health services.

  Child and Adolescent Psychiatric Clinics of North America, *13*, 905-921.

National Advisory Mental Health Council (2001). *Blueprint for Change: Research on Child and*

  Adolescent Mental Health. Washington D.C.: Author.

Patall, E. A., Cooper, H., & Robinson, J. C. (2008). Parent involvement in homework: A

  research synthesis. *Review of Educational Research*, *78*(4), 1039-1101.

Pelham, W., Gnagy, E., Greenslade, K., & Milich, R. (1992). Teacher ratings of DSM-III-R

  symptoms for the disruptive behavior disorders. *Journal of the American Academy of*

  Child & Adolescent Psychiatry, 31, 210-218.

Pelsma, D., Richard, G., Harrington, R., & Burry, J. (1989). The quality of teacher work life survey: A measure of teacher stress and job satisfaction. *Measurement and Evaluation in Counseling and Development, 21*, 165-176.

Pianta, R. C., La Paro, K. M., & Hamre, B. K. (2008). *The Classroom Assessment Scoring System*. Baltimore: Paul H. Brookes Publishing.

Reardon, S. (2011). The widening academic achievement gap between the rich and the poor: New evidence and possible explanations. In G. Duncan and R. Murnane (Eds.), *Whither opportunity?: Rising inequality, schools, and children's life chances* (pp. 91-116). NY: Russell Sage Foundation..

Ringeisen, H., Henderson, K., & Hoagwood, K. (2003). Context matters: Schools and the research to practice gap in children's mental health. *School Psychology Review, 32*, 153-168.

Roeser, R., Eccles, J., & Freedman-Doan (1999). Academic functioning and mental health in adolescence: Patterns, progressions, and routes from childhood. *Journal of Adolescent Research, 14*. 135-174.

Rogers, E. M. (1995). *Diffusion of innovation (4ᵗʰ Ed.).* NY: The Free Press.

Rones, M., & Hoagwood, K. (2000). School-based mental health services: A research review. *Clinical Child & Family Psychology Review, 34*, 223-241

Serpell, R., Sonnenschein, S., Baker, L., & Ganapathy, H. (2002). Intimate culture of families in the early socialization of literacy. *Journal of Family Psychology, 16(4)*, 391.

Shapiro, E. (2004). *Academic skills problems: Direct assessment and intervention* (3rd ed.). NY: Guilford.

Sheridan, S. M., & Kratochwill, T. R. (2007). *Conjoint behavioral consultation: Promoting*

family-school connections and interventions. New York, NY: Springer.

Spencer, M., Cole, S., DuPree, D., & Glymph, A., (1993). Self-efficacy among urban African

American early adolescents: Exploring issues of risk, vulnerability, and resilience.

Development & Psychopathology, 5, 719-739.

Stiffman, A., Stelk, W., Evans, M., & Atkins, M. (2010). A public health approach to children's

mental health services: Possible solutions to current service inadequacies. *Administration

and Policy in Mental Health and Mental Health Services Research, 37*, 120-124.

Stringfield, S. (1994). A model of elementary school effects. In D. Reynolds et al. (Eds.)

Advances in school effectiveness research and practice (pp. 153-188). NY: Elsevier.

Tschannen-Moran, M., & Hoy, A. (2001). Teacher efficacy: Capturing an elusive construct.

Teaching and Teacher Education, 17, 783-805.

U.S. Department of Justice, (2003). *Youth victimization: Prevalence and implications*.

Washington, DC: Author

Walker, H. M., & Severson, H. H. (1990). *Systematic screening for behavior disorders (SSBD)*.

Longmont, CO: Sopris West.

Weisz, J., Ng, M., & Bearman, S. (2014). Odd couple? Reenvisioning the relation between

science and practice in the dissemination-implementation era. *Clinical Psychological

Science, 2,* 58-74.

Table 1. *Sample Baseline Demographic Characteristics*

Demographic Characteristics		Links to Learning	Services As Usual	Total
Child		(*n* = 104)	(*n* = 67)	(*N* = 171)
Age in years, M (SD)		7.42 (1.81)	7.66 (1.53)	7.51 (1.71)
Gender	Boys	74 (71%)	50 (75%)	124 (73%)
	Girls	30 (29%)	17 (25%)	47 (27%)
African American		98 (94%)	62 (93%)	160 (93.6%)
Latino/a		1 (1%)	0 (0%)	1 (0.6%)
Multiracial		2 (2%)	4 (6%)	6 (3.5%)
Other		3 (3%)	1 (1%)	4 (2.3%)
DBD Diagnosis[1]				
DBD Diagnosis[1]	ADHD	41 (39%)	38 (57%)	79 (46%)
	ODD	30 (29%)	31 (46%)	61 (36%)
	CD	16 (15%)	19 (28%)	35 (20%)
Parent		(*n* = 97)	(*n* = 61)	(*N* = 158)
Age in years, M (SD)[2]		32.06 (7.92)	32.64 (8.44)	32.28 (8.10)
Gender[3]	Male	1 (1%)	6 (10%)	7 (4%)
	Female	94 (97%)	55 (90%)	149 (94%)
Employment	Full-time	27 (28%)	15 (25%)	42 (27%)
	Part-time	19 (20%)	11 (18%)	30 (19%)
	Unemployed	39 (40%)	28 (46%)	67 (42%)
	Other	12 (12%)	7 (11%)	19 (12%)
Income	$0-$10,000	59 (61%)	31 (50.8%)	90 (57%)
	$11,000-$20,000	19 (20%)	11 (18.0%)	30 (19%)
	$21,000-$30,000	9 (9%)	12 (19.7%)	21 (13%)
	$31,000-$40,000	2 (2%)	1 (1.6%)	3 (2%)
	Over $40,000	4 (4%)	1 (1.6%)	5 (3%)
	Declined to report	4 (4%)	5 (8.2%)	9 (6%)
Education	GED	11 (11.3%)	9 (15%)	20 (12.7%)
	High School	46 (47.4%)	28 (46%)	74 (46.8%)
	Some College	21 (21.6%)	14 (23%)	35 (22.2%)
	Bachelor's Degree	4 (4.1%)	0 (0%)	4 (2.5%)
	Other	15 (15.5%)	10 (16%)	25 (15.8%)
Teachers[4]		(*n* = 71)	(*n* = 65)	(*N* =136)
Age in years, M (SD)[5]		41.44 (13.46)	35.58 (11.46)	38.37 (12.73)
Gender[6]	Male	7 (10%)	6 (9%)	13 (10%)
	Female	52 (73%)	51 (78%)	103 (76%)
Race/Ethnicity[6]	Black	37 (52%)	30 (46%)	67 (49%)
	White	21 (30%)	21 (32%)	42 (31%)
	Latino/a	0 (0%)	2 (3%)	2 (1%)
	Asian American	0 (0%)	2 (3%)	2 (1%)
	Other	1 (1%)	2 (3%)	3 (2%)
Yrs Teaching[7]	Novice (0-3)	12 (17%)	26 (40%)	38 (28%)
	Mid Career (4-6)	7 (10%)	9 (13.8%)	16 (12%)
	Experienced (7-37)	39 (55%)	22 (34%)	61 (45%)

Note. [1] ADHD collapsed across all subtypes, Ns do not reflect comorbidity. [2] Three parents in the treatment condition and three parents in the comparison condition did not report age. [3] Two parents in the treatment condition did not report gender. [4] Key Opinion Leaders (KOLs) are included in the sample of intervention teachers. [5] Twenty-one teachers in the treatment condition and ten teachers in the comparison condition did not report age. [6] Twelve teachers in the treatment condition and eight teachers in the comparison condition did not report race/ethnicity. [7] Thirteen teachers in the treatment condition and eight teachers in the comparison condition did not report teaching experience.

Table 2

Behavioral and Academic Outcome Means and Standard Deviations Across Time by Condition

Dependent Measures	Baseline	Time 2	Time 3	Time 4	Time 5	Time 6
SAU						
BOSS Off Task	59.25 (18.87)	64.89 (15.30)				
BOSS Engagement*	53.54 (18.00)	47.91 (19.36)				
SSRS Prob. Beh (P)	18.64 (6.05)	18.61 (6.65)	17.97 (6.03)	17.62 (6.16)	17.57 (6.10)	17.91 (6.02)
SSRS Prob. Beh (T)	19.65 (6.80)	21.29 (4.92)	20.25 (6.08)	21.22 (6.15)	20.32 (6.71)	20.95 (5.85)
SSRS Social Skills (P)	41.94 (10.90)	43.97 (10.64)	44.18 (10.99)	44.91 (9.80)	43.94 (10.42)	44.48 (11.24)
SSRS Social Skills (T)	24.7 (6.68)	26.32 (6.42)	24.57 (8.75)	25.88 (8.82)	25.55 (8.20)	25.44 (7.56)
SDQ (P)	3.28 (2.54)	3.19 (2.44)	3.29 (2.52)	3.43 (2.57)	3.18 (2.42)	3.29 (2.59)
SDQ (T)	3.07 (1.78)	3.33 (1.62)	3.42 (1.94)	3.51 (1.84)	3.63 (1.68)	3.56 (1.80)
CBM	34.69 (31.54)	44.80 (35.22)	46.10 (33.185)	55.77 (41.08)	51.20 (40.83)	62.14 (42.58)
ACES*	2.62 (0.80)	2.73 (0.74)	2.60 (0.77)	2.62 (0.71)	2.69 (0.73)	2.61 (0.62)
Homework Prob. Checklist	1.15 (0.65)	1.14 (0.60)	1.13 (0.63)	1.19 (0.66)	1.17 (0.64)	1.23 (0.68)
L2L						
BOSS Off Task	56.99 (17.35)	61.58 (19.43)	58.16 (16.09)	54.58 (19.37)	57.54 (20.15)	58.27 (21.42)
BOSS Engagement*	46.05 (14.96)	51.96 (20.33)	51.58 (16.56)	55.66 (19.56)	54.01 (18.52)	52.22 (22.22)
SSRS Prob. Beh (P)	18.62 (6.63)	19.43 (6.80)	17.72 (6.66)	19.05 (7.21)	18.58 (7.45)	18.77 (6.57)
SSRS Prob. Beh (T)	17.82 (5.44)	20.18 (6.36)	18.86 (5.81)	20.15 (6.56)	19.14 (7.47)	20.06 (7.53)
SSRS Social Skills (P)	41.08 (11.66)	45.95 (10.94)	45.84 (12.16)	47.35 (11.59)	47.14 (11.82)	47.43 (11.31)
SSRS Social Skills (T)	22.27 (7.01)	24.05 (7.88)	24.66 (8.02)	26.06 (9.92)	25.73 (10.06)	25.62 (10.21)
SDQ (P)	3.33 (2.55)	3.26 (2.85)	3.03 (2.68)	2.99 (3.03)	3.26 (3.11)	3.31 (3.09)
SDQ (T)	2.64 (1.48)	3.01 (1.72)	2.73 (1.67)	2.96 (1.77)	2.56 (1.79)	2.97 (1.65)
CBM	39.77 (32.86)	48.98 (37.27)	42.00 (34.77)	55.00 (41.97)	42.63 (35.65)	56.71 (42.97)
ACES*	2.28 (0.81)	2.51 (0.71)	2.41 (0.75)	2.54 (0.86)	2.50 (0.84)	2.50 (0.80)
Homework Prob. Checklist	1.13 (0.66)	1.29 (0.75)	1.21 (0.74)	1.28 (0.74)	1.24 (0.73)	1.23 (0.67)

Note. P = Parent Report; T = Teacher Report;
BOSS Engagement and BOSS Off Task collected only at baseline and time 2 for the SAU condition. *indicates significant difference between L2L and SAU groups.

Table 3

MRM Parameter Estimates (Standard Errors) for Child Behavioral Outcomes Including Significant Covariates

	SSRS Problem Behaviors (P)	SSRS Problem Behaviors (T)	SSRS Social Skills (P)	SSRS Social Skills (T)	SDQ (P)	SDQ (T)	BOSS Off Task (PC)	BOSS Engagement (PC)
Fixed Effects								
Intercept	18.51 (0.72)	24.16 (1.72)	42.77 (1.18)	24.80 (0.82)	3.57 (0.70)***	3.96 (0.54)	43.59 (1.65)	42.90 (4.93)
Intervention	-0.12 (0.93)	-1.25 (0.85)	-0.30 (1.52)	-1.46 (1.09)	0.17 (0.36)	-0.23 (0.25)	14.80 (1.39)***	-9.68 (1.40)***
Time	-0.21 (0.15)	0.26 (0.14)	0.48 (0.26)	0.15 (0.18)	-0.11 (0.08)	0.12 (0.05)**	1.10 (0.41)**	-0.79 (0.44)
Time*Intervention	0.24 (0.19)	0.12 (0.18)	0.77 (0.34)*	0.49 (0.23)*	-0.05 (0.09)	-0.06 (0.06)	-1.29 (0.46)**	1.50 (0.46)**
Random Effects								
Teacher intercept	N/A	7.82 (2.43)**	N/A	12.97 (3.82)**	N/A	0.56 (0.17)**	64.31 (19.66)**	51.22 (16.05)**
Child intercept	28.15(3.79)***	15.11 (2.50)***	76.68 (9.69)***	24.10 (4.07)***	3.92(0.52) ***	1.09 (0.23)***	26.99 (15.02)*	7.22 (12.27)
Child slope	0.70(0.17)***	0.17 (0.16)*	2.72 (0.52)***	0.32 (0.26)**	0.16 (0.03)***	0.02 (0.02)	4.81 (2.22)*	3.90 (2.41)
Residual	12.46 (0.70)***	9.33 (0.62)***	31.92 (1.84)***	15.89 (1.05)***	2.09(0.12)***	1.03 (0.07)***	175.36 (8.55)***	175.72 (8.64)***
Effect Size (95% CI)	.17(-.14,.48)	.08(-.22,.39)	.31(.001,.62)	.24(-.07,.55)	.08(-.23,.39)	.15(-.16,.46)	.32(.011,.63)	.4(.09,.71)

Note. P = Parent Report;. T = Teacher Report; PC = Peer Comparison. When teacher intercept did not contribute significant variance a

two level model using the child intercept and child slope was used. These analyses only include significant covariates in the model.

Effect size estimates for significant Time*Intervention effects.

* $p < 0.05$; ** $p < 0.01$; *** $p < 0.001$.

Table 4

MRM Parameter Estimates (Standard Errors) for Child Academic Outcomes Including Significant Covariates

	ACES	CBM	Homework Prob. Checklist
Fixed Effects			
Intercept	2.65 (0.08)	44.57 (9.95)	0.98 (0.08)
Intervention	-0.32 (0.11)**	9.38(4.68)*	0.07 (0.09)
Time	-0.01 (0.01)	4.99 (0.57)***	-0.02 (0.02)
Time*Intervention	0.04 (0.02)**	-1.28 (0.72)	-0.002 (0.02)
Random Effects			
Teacher intercept	.12 (.04)**	156.47 (74.26)*	0.04 (0.02)*
Child intercept	.39 (.05)***	775.8 (96.7)***	0.37 (0.05)***
Child slope	0.001 (0.002)	12.10 (2.73)***	0.01(0.003)**
Residual	0.10 (0.01)***	52.11 (3.98)***	0.07 (0.005)***
Effect Size (95% CI)	.27(-.04,.58)	.17(-.14,.48)	.02(-.29,.32)

Note. When teacher intercept did not contribute significant variance a two level model using the

child intercept and child slope was used. These analyses only include significant baseline

covariates in the model. Effect size estimates for significant Time*Intervention effects.

* $p < 0.05$; ** $p < 0.01$; *** $p < 0.001$.

Table 5

MRM Parameter Estimates (Standard Errors) for Significant Moderators of L2L Behavioral and Academic Outcomes

	ACES	SSRS Social Skills (P)	SSRS Social Skills (P)	SSRS Social Skills (T)	BOSS Engagement
Fixed Effects					
Intercept	2.59(.09)	42.40(1.19)***	43.53(1.28)***	24.22(.88)	53.57(2.39)
Time	-0.02(.01)	0.50(0.26)	0.49(0.27)	0.05(.18)	-5.59(2.61) **
Intervention	-0.32(0.11)**	0.57(1.53)	-0.24(1.56)	-1.4(1.08)	-7.27(2.92) **
Time * Intervention	0.11(0.02) ***	0.61(0.34)	0.50(0.37)	0.95(.30)**	7.60(3.67)
SDQ (T)	--	--	--	--	--
Parent Hassles	--	5.06(0.89) ***	--	--	--
Gender (female = 1)	--	--	-3.04(1.67)	--	.31(2.66)
Grade	0.13(0.06) *	--	--	1.24(.68)	--
Time*Intervention*SDQ	--	--	--	--	--
Time*Intervention*Hassles	--	-1.25(0.42) **	--	--	--
Time*Intervention*Gender	--	--	0.97(0.47) *	--	12.35(5.34) **
Time*Intervention*Grade	-0.10(0.02)***	--	--	-0.64(.27)*	--

Note. Moderators were entered into the model individually for each outcome measure. Displayed are values associated with significant

moderation results. Dashed lines indicate nonsignificant parameter estimates. P = Parent Report; T = Teacher Report. BOSS

Engagement was analyzed for Year 1 only, with children from SAU schools rather than in-class peers modeled as the comparison

group. * $p < 0.05$; ** $p < 0.01$; *** $p < 0.001$.

Assessed for eligibility (*n*= 280)

Random assignment of schools (N = 6)

Assigned to experimental group (L2L) (3 schools + 1 replacement, *n*= 156 children)

Assigned to comparison group (SAU) (3 schools, *n*= 124 students)

Enrolled in L2L (*n*= 122)

Refused to participate (*n*= 34)

Enrolled in SAU (*n*= 87)

Refused to participate (*n*= 37)

Analyzed (*n*= 104)

Excluded from analysis (*n*= 0)

Excluded (total *n*= 18) because:

Did not meet inclusion criteria (*n*= 8)

Other reasons (*n*= 10)
- Agency reached case load maximum (n = 1)
- Transferred schools (n=1)
- Parent consented but no interview (n=2)
- Insufficient data (n=6)

Analyzed (*n*= 67)

Excluded from analysis (*n*= 0)

Excluded (total *n*= 20) because:

Did not meet inclusion criteria (*n*= 5)

Other reasons (*n*= 15)
- Consented but no parent interview (*n* =11)
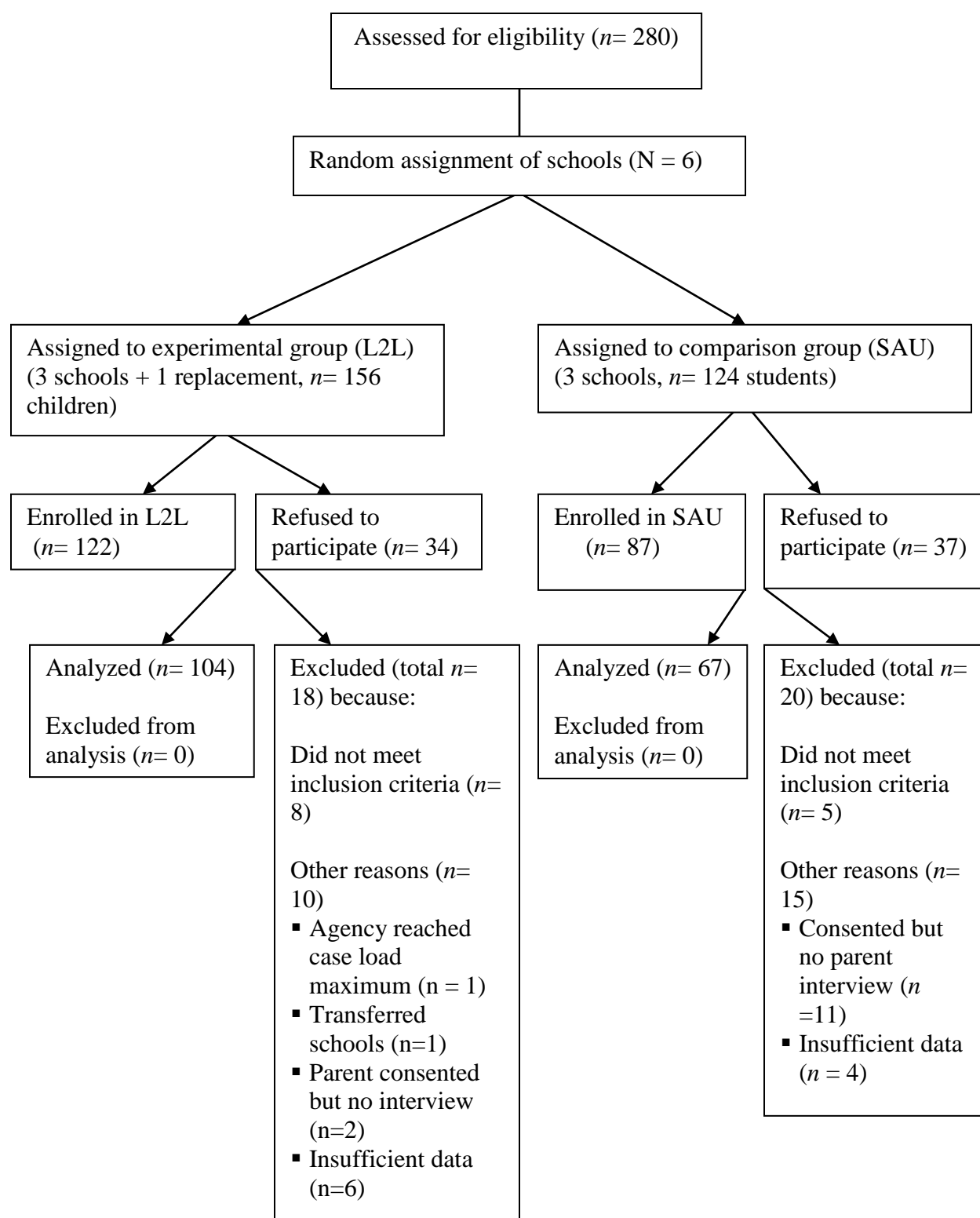- Insufficient data (*n* = 4)

Figure 1. Consolidated Standards of Reporting Trials (CONSORT) flow diagram. L2L = Links to Learning; SAU = Services as Usual.
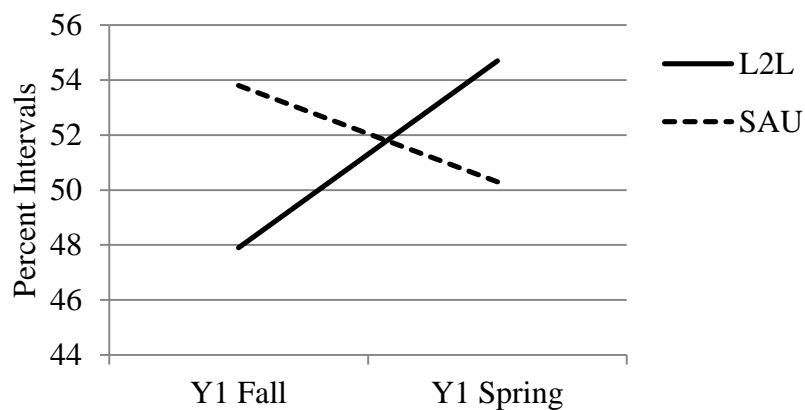
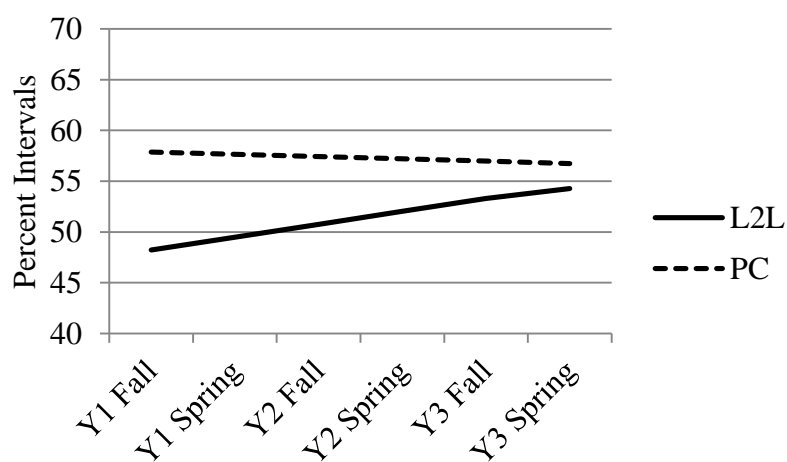*Figure 2A*. Year 1 Child Observation (BOSS) of Engagement (L2L vs. SAU)

Figure 2B. Child Observations (BOSS) of Engagement Across Three Years (L2L vs. Peer Comparisons)