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Commissioned Article

# Academic achievement of African American boys: A city-wide, community-based investigation of risk and resilience<sup>☆</sup>

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### ABSTRACT

In light of persistent Black–White achievement gaps for boys, this study examined publicly monitored risks believed to be associated with being behind academically for an entire subpopulation of African American boys in a large urban public school district. Also examined were indicators of academic engagement hypothesized to mediate the relations between risks and low achievement. Findings indicated that the Black–White achievement gap for boys was matched by a comparable difference in risk experiences. Multilevel linear regression models controlling for poverty found that both the type and accumulation of risk experiences explained a significant amount of variation in reading and mathematics achievement for the subpopulation of African American boys. Socio-familial risks were related to the poorest academic outcomes. Academic engagement indicators significantly mediated relations between risks and achievement. Implications of this research for collective school and community actions to make race, gender, and place matter in educational public policy were discussed.

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## 1. Introduction

Since the first national educational progress report in 1970, we have witnessed four decades of persistent achievement gaps for African American children ([National Assessment of Educational Progress \[NAEP\], 2009](#)). Despite advances in civil rights, educational methods, and technology, findings document

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that African American children start school substantially behind their peers and fall nearly 0.10 standard deviations further behind each year from first to third grade (Fryer & Levitt, 2006). Even when school differences in achievement are taken into account, this significant gap remains (Fryer & Levitt, 2004). National data show that when both race and gender are considered the greatest gaps are found for African American boys (Coley, 2011; Matthews, Kizzie, Rowley, & Cortina, 2010). Data from NAEP (2009) indicated that by fourth grade, African American boys enrolled in public schools scored an average of 28 points lower in both reading and mathematics than White boys, which translates to a three-quarter to one full standard deviation difference, respectively. Even within the subset of children who qualified for free lunch, the differences between African American and White boys were roughly half a standard deviation for both reading and mathematics.

These educational concerns for African American boys are associated with a host of additional negative statistics and societal fears about their increased likelihood of maladaptive developmental trajectories. A report by the Children's Defense Fund (2007) entitled, *America's Cradle to Prison Pipeline* reflects these intense concerns by addressing the heightened risk of future incarceration. An African American boy born in 2001 has a 1 in 3 chance of going to prison in his lifetime compared to a 1 in 17 chance for a White boy. This report points to a substantial list of risks believed to be associated with this cradle to prison pipeline that disproportionately affect African American children. Their infant mortality rate, for example, is nearly three times the rate of White children (13.2% compared to 5.6%, respectively; Kids Count, 2010). Mothers of African American children are also less likely to receive adequate prenatal care and are 2.4 times more likely to give birth as a teenager compared to White women. Further, African American women are two to three times as likely to have babies with low birth weight (Reichman, 2005). The U.S. Department of Health and Human Services (2011) reports that African American children have the highest prevalence of child maltreatment (14.6 out of 1000). With respect to indicators of residential instability, The National Center on Family Homelessness (2009) reports that African American families are the largest group who experience homelessness; 47% of the homeless population is African American. Furthermore, 13% of African American children under age 18 have a mother without a high school education, compared to 5% of White children (Aud, Fox, & Kewal Ramani, 2010).

Social scientists and advocates for African American boys have charged that our current body of research tracking these relevant risks and test-score gaps is inadequate to address these urgent and complex problems (Anderson, 2008; Howard, 2008). They postulate that this research has been disconnected from the mission of public educators and providers of health and human services within large urban communities where African American children are disproportionately segregated. The research is not positioned within intentional communities of inquiry that would hold researchers, educators, and service providers accountable to the African American population for generating *actionable intelligence* regarding *what's behind being behind* and what has promise for promoting educational well being (Garcia Coll & Garrido, 2000; Jackson & Moore, 2008). Public educators and health, child welfare, and public housing providers are each charged with the well being of children in the local municipality, particularly those who are most vulnerable. Unfortunately, there is little research at the intersection of these multiple municipal systems that can inform collective civic action about how to best use research to identify risks and promote resiliency for vulnerable groups of young children (Edelman, 2008). The existing research is decontextualized and limits the practicality of the findings to affect beneficial local change for African American boys.

There are several other limitations to our current body of educational risk research that hinder effective community action for African American boys. Studies are often conducted with homogenous samples of convenience that include only those children who are exposed to a particular risk, such as groups of children living in homeless shelters or those found within specific child maltreatment caseloads (Coulton, Korbin, Su, & Chow, 1995; Ziesemer, Marcoux, & Marwell, 1994). Such homogenous study samples that do not include the larger community population from which these high-risk samples are drawn are unable to generate estimates of the absolute and relative effects associated with a particular risk factor. Cross-sectional, convenience samples of children with a particular risk are also limited in that they do not provide a comprehensive picture of cumulative risk exposure across time. Particularly for young African American children enrolled in urban public schools, risk experiences often co-occur at various times throughout their early childhood years and interact with one another over time to impact educational outcomes (Macomber, 2006; Rouse & Fantuzzo, 2009). Studies of cumulative risk experiences have documented the unique effects of such multiple risks (e.g., Gutman, Sameroff, & Cole, 2003; Pungello, Kupersmidt, Burchinal, & Patterson, 1996), however, they are not typically conducted *within* important subpopulations such as African-American boys.

Longitudinal, community-based research is needed to investigate the unique and cumulative relations between multiple risks and educational well being for African American boys. For example, a recent population-based study that accounted for a multiple-risk context challenged existing research on the negative impact of out-of-home placement on early educational outcomes by documenting the mediating effects of homelessness and child maltreatment (Fantuzzo & Perlman, 2007). Previous statistical models that did not include homeless and maltreatment experiences found large, statistically significant negative relations between out of home placement (i.e., foster care) and educational outcomes—suggesting that the placement itself was a risk factor. The inclusion of these other important mediating variables demonstrated the import of comprehensive models that are better able to determine the complex pathways in which multiple risks affect the development of young children.

The test-score gap literature also provides an incomplete picture for African American boys. While there is a great deal of evidence that the gap between African American and White children is substantial, there is relatively little research conducted *within* existing communities of African American boys that can point to their distinctive needs and strengths and lead to local intervention. Nationally representative studies of children from a variety of schools, neighborhoods, and risk contexts do little to inform local efforts where the population of students is not “nationally representative.” Despite efforts toward equality, the fact is that a majority of our poor, African American children continue to be segregated in schools and neighborhoods that are not “typical” of national samples in the literature base (Vigdor & Ludwig, 2007). Rather, the experience of African American boys in large urban, public schools is more often represented by a sociocultural context that increases their risk for poor academic outcomes (Garcia Coll & Garrido, 2000). This context may be marked by segregation, racism, and discrimination that results in less access to resources and lower expectations of both the majority and minority groups that the resources will make a difference. Models that only focus on deficits and are used to interpret the cultural, ethnic, and racial differences outside of the broader local context fail to reflect the resilience of segregated families and thereby perpetuate racism and intensify risk. Research that is positioned within local communities and is sensitive to the heterogeneity within the subpopulation of African American boys would provide “actionable intelligence.” Actionable intelligence is useful information that can be used by policy makers and practitioners to develop local intervention in response to the relations between multiple risks and educational outcomes.

Another limitation of the test-score gap research for African American boys is the lack of adequate consideration of significant protective factors that have known relations with academic performance, such as academic engagement. Reports about the current national dropout crisis indicate that though some students drop out because of academic challenges, most go through a gradual process of disengagement from school that starts in the early grades and is only partially related to their achievement levels (Bridgeland, Dilulio, & Morison, 2006). Engagement behaviors, on the other hand, serve to promote continued participation in educational activities and the pursuit of achievement outcomes. Behaviors in the classroom that include attention control, persistence, flexibility, and problem solving have strong relationships with academic achievement as they support student's engagement in classroom learning situations and facilitate their success toward achievement outcomes (Schaefer & McDermott, 1999; Yen, Konold, & McDermott, 2004). Children who demonstrate such positive learning-related engagement behaviors are also less likely to be identified for special education remediation (McDermott, Goldberg, Watkins, Stanley, & Glutting, 2006).

Early school attendance patterns are another example of academic engagement behaviors that relate to achievement. The behavior of children who do not attend school regularly provides early indications of disengagement from school that could lead to later dropout (Applied Survey Research, 2011; Gottfried, 2009). For young children in their first few years of school, poor attendance may be more indicative of parental disengagement than student conduct, given the parents' responsibility for getting their children to school each day. Our research models need to include such sets of child and family engagement variables to determine how they may mediate the relations between risks and achievement (Matthews et al., 2010). Both indicators of engagement at the family (i.e., school attendance) and child (i.e., classroom behaviors) levels should be included in models attempting to extend our knowledge of the achievement gaps for African American boys.

### 1.1. Developmental-ecological model

The limitations of educational risk and test-score gap research for African American boys in large, urban communities indicate a need for a comprehensive theoretical model that addresses these issues. A

developmental-ecological model provides such a responsive conceptual framework. This model recognizes that the acquisition of developmentally appropriate competencies results from complex transactions of person, context, and time (Bronfenbrenner, 2005; Swick & Williams, 2006). Each child brings a unique set of characteristics into the world, such as gender and race, which transact with the expectations of multiple systems within the child's ecology to influence development. For young children, their most influential systems are home and school (Huston & Bentley, 2010). These systems provide early experiences that either impede or enhance the development of competencies necessary for successful functioning. In this model, development is both cumulative and progressive; prior adaptation or maladaptation influences future functioning, creating a distinctive developmental trajectory for each child. This trajectory is marked by a history of successful or unsuccessful experiences transacting with the expectations of the most influential people and contexts in the child's ecology (Ayoub et al., 2006; Neuman & Celano, 2004). Here too, there is recognition that factors beyond the child's immediate proximal context, such as community and societal factors, influence a child's developmental trajectory. For example, the level of risks or resources or the social policies and hierarchies that exist in the community in which the child lives also have a distinctive influence on the course of the child's development. For young African American children attending public schools in large, segregated, urban environments, this model underscores the significance of investigating family, school, and community factors that influence development and are monitored by local policy makers and advocacy groups. Disproportionate exposure to biological and social risk factors such as low birth weight or child maltreatment can compromise developmental competencies and render children less able to meet the classroom expectations for academic achievement. On the other hand, protective influences from the family, school, and community can help mitigate the impact of risks and foster productive learning experiences.

## 1.2. Purpose of the study

To increase the likelihood that Black–White achievement gap research produces actionable intelligence to inform civic action, this research was purposefully situated in a large, urban community of inquiry. In partnership with municipal leaders from across multiple public service systems, this study used an established integrated data system that contained comprehensive sets of information about children's early experiences. The leadership commissioned researchers to investigate relations between reading and mathematics achievement and sets of evidence-based risk and protective factors monitored by these systems for an entire subpopulation of third-grade African American boys. This time was strategically selected, as it is the *first* assessment of early achievement that is monitored by the public education system in accordance with accountability mandates. Informed by a developmental ecological model and with the capacity of this longitudinal integrated data system, this study was able to provide a comprehensive account of African-American boys' multiple-risk context from birth to third grade and indicators of academic engagement found in public administrative data and school district records, respectively.

There were four primary research questions that guided this investigation. First, what is the achievement gap between African-American boys and their Caucasian counterparts who live and attend school in the same community environments? The second question asked what is the cumulative "risk gap" between these two groups? These two questions provided for a comparison of the achievement and risk gaps to better understand *what's behind being behind* for African-American boys. Next, this study asked how the individual and cumulative risk experiences of African-American boys related to their third grade achievement outcomes. By conducting analyses within this important subpopulation the investigation sought to better understand the relations between publicly monitored risks and outcomes to inform strategic intervention by community service providers for this group of vulnerable children. The final research question investigated how academic engagement, defined along two dimensions including school attendance and task engagement in the classroom, served to mediate relations between individual and cumulative risk experiences and academic outcomes.

## 2. Method

### 2.1. Participants

This study was conducted in the School District of Philadelphia with the third-grade cohort of students in 2005–2006 ( $N = 14,034$ ). To capture the comprehensive experiences of children from birth through

third grade, participants included only those students who were born in the municipality ( $n = 10,738$ ). The sample was further limited to include the 8889 students who had at least one valid outcome in reading and/or mathematics achievement in third grade. This study sample comprised 65.9% African American, 14.6% White, 14.5% Hispanic, and 5% Asian/Other students. Approximately half of the students were male (51%). Nearly 70% of students received free or reduced lunch before or during third grade. Table 1 provides student- and school-level demographic comparisons between the full third-grade cohort in 2005–2006, those who were born in Philadelphia and remained in the School District in third grade, and the study sample. The study sample had slightly more African American children and students qualifying for free or reduced lunch. The analytic sample consisted of two subsets, African American boys ( $n = 2930$ ) and White boys ( $n = 605$ ), who were drawn from the study sample.

## 2.2. Measures

### 2.2.1. PSSA scaled scores

The Pennsylvania System of School Assessment (PSSA) is the standardized, criterion-referenced assessment implemented to measure student achievement for federal reporting under the No Child Left Behind Act (NCLB; U.S. Congress, 2001). The PSSA assessment consists of reading and mathematics subscales. The reading composite scale includes measures of essential reading skills (e.g., finding the main idea, drawing conclusions, and making inferences) and vocabulary (e.g., identifying words and their meanings in different contexts and categories of words based on meaning). The mathematics composite scale assesses mathematical computation (e.g., addition, subtraction, multiplication, division, fractions, decimals, and percents), mathematical concepts (e.g., length, weight, time, and geometry), and application of mathematical concepts and computation through open-ended questions. Reliability and validity of the PSSA have been well established including internal consistency ( $\alpha = .91$  to  $.93$ ), inter-rater reliability ( $\alpha = .40$  to  $.92$ ) and content and construct validity using factor analysis, item response theory, and differential item functioning across race and gender groups (CTB/McGraw-Hill, 2006; Thacker, Dickinson, & Koger, 2004).

### 2.2.2. TerraNova scaled scores

TerraNova (CTB/McGraw-Hill, 1997, 2001) is a nationally normed, standardized, group-administered achievement test. It provides standardized reading and mathematics achievement. The Reading Composite includes measures of essential reading skills including finding the main idea within a passage, drawing conclusions, making inferences, and understanding context clues. The Mathematics Composite assesses mathematics computation, knowledge of mathematical concepts, and the application of mathematical concepts and computation through word problems. Developers provide acceptable evidence of reliability and validity supporting its use with all US populations of students by race and gender.

**Table 1**

Student and school demographics of the third-grade cohort, birth cohort, and study sample.

	All 3rd graders 2005–2006 ( $N = 14,034$ )	Born in Philadelphia ( $n = 10,639$ )	Study sample ( $n = 8889$ )
Student characteristic			
Sex (male)	50.9	50.7	50.5
African American	62.3	66.7	66.2
Caucasian	13.9	14.2	13.6
Latino	17.4	14.4	15.2
Asian/Other	6.5	4.8	5.0
Poverty	66.8	69.2	70.4
School third-grade characteristics ( $j = 208$ )		( $j = 208$ )	( $j = 197$ )
Sex (male)	50.5	50.5	50.7
African American	68.4	68.9	69.3
Caucasian	14.1	14.5	13.2
Latino	12.5	11.9	12.5
Asian/Other	5.0	4.7	5.0
Poverty	69.7	66.5	68.1

### 2.2.3. Poverty

Poverty data were provided by the School District. Poverty was defined based on children's receipt of free or reduced lunch. The School District determines student eligibility according to their participation in the Temporary Assistance for Needy Families (TANF) program. A dichotomous variable was created to determine the presence or absence of poverty at any point between first and third grade.

### 2.2.4. Child maltreatment

The Department of Human Services (DHS) maintains a database tracking system that archives each report of child maltreatment. Within the municipality each allegation of child maltreatment (physical abuse, sexual abuse, and/or neglect) is formally investigated. Affirmative substantiated investigation results are defined as those with alleged harm or with risk or threat of harm to the child. A binary variable was created to determine the presence or absence of substantiated child maltreatment any time prior to the end of third grade.

### 2.2.5. Low maternal education at birth

The number of years of education completed by the child's mother at the time of the child's birth was obtained from the Department of Public Health (DPH) birth records. Low maternal education at birth was defined as children whose mothers were at least 18 years old and had completed less than 12 years of formal schooling.

### 2.2.6. Homelessness

Information regarding children's homeless experiences was collected from the Office of Supportive Housing (OSH) and DHS. A binary variable was created by identifying a parent within the OSH database who registered in a public shelter with children at any time between the child's birth and the end of third grade. Additionally, homelessness was determined if a child had been placed in a DHS funded emergency homeless shelter.

### 2.2.7. Inadequate prenatal care

The DPH birth records provided data regarding the mother's prenatal care experience. A binary variable was created to indicate children whose mother received no prenatal care, prenatal care only in the third trimester, or fewer than four prenatal visits overall.

### 2.2.8. Preterm/low birth weight

DPH birth certificate records indicated if a child was premature (born at less than 36 weeks gestation) and/or low birth weight (weighed less than 2500 g).

### 2.2.9. Lead exposure

DPH maintains a lead exposure registry for the children residing in the city. Pediatricians are required by the state to conduct the lead testing of all children. The U.S. Centers for Disease Control and Prevention (CDC) defines a blood lead level of 10 micrograms ( $\mu\text{g}$ ) per deciliter of blood (dL) as a level of concern. Children were indicated as having lead exposure if they tested at 10  $\mu\text{g}/\text{dL}$  or higher at any point before the end of third grade.

### 2.2.10. Cumulative risk

A sum of the six dichotomous risk variables (child maltreatment, maternal education at birth, homeless shelter stay, prenatal care, preterm/low birth weight, and lead exposure) created a cumulative risk score. This cumulative risk score ranged from zero to six. Previous research using this study sample found that scores on student educational outcomes declined as the number of risks increased. However, scores plateaued across 3 or more risks (Rouse, Fantuzzo, & LeBoeuf, 2011). Therefore this scoring was used in the current study to categorize children into four cumulative risk groups: children who had zero (reference group), one, two, and three or more risks.

### 2.2.11. Task Engagement Problems

Task Engagement Problems is one dimension of the Problems in Classroom Engagement Scale (PCES; Fantuzzo, Li, Rouse, LeBoeuf, & McDermott, in preparation). The PCES is a behavior checklist designed to identify children's difficulties engaging in routine learning experiences in their elementary school classrooms. Task Engagement Problems comprises 8 items such as demonstrates consistent effort, can work independently, and shows positive attitudes toward learning. Teachers indicate whether the child needs improvement on each behavior item. Ratings are recorded three times per academic year throughout first, second, and third grades and included as part of the children's report card. This measure is an adaptation of prior performance assessments used in the school district to evaluate classroom behavior at one point in time using a three-point Likert-type scale ranging from "improvement needed," "making progress," and "competent." The PCES is part of school district's report card system for classroom behavior. As such it is administered three times a year. Concurrent and predictive validity findings support the use of this scale with children in elementary school and items demonstrated no differential functioning across gender and race groups (Fantuzzo et al., in preparation). This study used the scores from the second report card period in third grade (prior to the administration of achievement tests).

### 2.2.12. Percentage of attendance

School District administrative records included daily attendance for every child. These records were used to calculate the percentage of attendance during the third grade year (days in school/total number of enrolled days).

## 2.3. Procedure

The Kids Integrated Data System was used to integrate municipal services data for the entire cohort of third-grade students (KIDS; Fantuzzo, Culhane, Rouse, Bloom, & Roig, 2006). This system allowed for child-level data integration across all relevant public municipal agencies that maintain archival administrative records on children and youth, ages 0–21 years. A Memorandum of Understanding provides guidelines for data access to ensure confidentiality standards. KIDS employs advanced technical methods to ensure data quality and integrity. Data management includes reliability and validity auditing of all data elements as well as the maintenance of data standards for quality. Databases used for the present study include the School District, Department of Public Health (DPH), Department of Human Services (DHS), and Office of Supportive Housing (OSH). Identifying information was used solely for integrating records across each data system. The final dataset provided to the research team was stripped of all identifiers and contained information on birth records, lead exposure, maternal education, child maltreatment, family homelessness, family poverty, and educational outcomes. The matching process used to link these data was completed using the Link King, a SAS application designed for probabilistic integration across multiple data sources using common sets of identifiers (e.g., names, address, and date of birth). Cases with potential false positive error comprised less than 1% of all matches in each dataset and were manually cross-referenced to ensure accuracy.

## 2.4. Data analysis

### 2.4.1. Achievement and cumulative risk gaps

To answer the first research question as to the magnitude of academic achievement gaps between African American and White boys, this study investigated differences using both state measures of academic performance (PSSA) as well as a nationally standardized test, the TerraNova. This was done to validate the group differences found with the PSSA and to demonstrate comparability of the state examination and a nationally standardized test. The second research question examined the cumulative risk gap for African American and White boys while controlling for poverty status. Analysis of Covariance was used to identify the mean differences (or gap) in achievement outcomes and the amount of cumulative risk. Effect sizes were calculated by computing the differences between the least-squared means (adjusted for poverty in the model) divided by a pooled standard deviation. Cohen's  $d$  was used as a benchmark to define the effect sizes as small ( $d = .20$ ), medium ( $d = .50$ ), and large ( $d = .80$ ). Logistic regression analyses were used to determine if there were group membership differences between African

American and White boys in each cumulative risk category (i.e., one risk, two risks, and 3 or more risks) and odds ratios were reported. To better understand the composite of the cumulative risk variable, frequencies were run to determine the prevalence of individual risk experiences with child maltreatment, low maternal education, homelessness, inadequate prenatal care, preterm/low birth weight, and lead exposure for both African-American and White boys. These prevalence rates were also compared to national rates to understand whether this sample experienced more or less risk than the U.S. population of children as a whole.

#### 2.4.2. Relations between risk and academic achievement for African American boys

To address the third research question, multilevel linear regression with Maximum Likelihood estimation was used to analyze the relations between both individual and cumulative risk and each achievement outcome in third grade for African American boys. This study employed multilevel linear modeling to account for the nesting of children within schools in order to avoid aggregation bias and misestimating of standard errors for regression coefficients (Raudenbush & Bryk, 2002). For both individual and cumulative risk, three sets of models were run to test associations with reading and mathematics achievement outcomes. First, an unconditional model was conducted in which no predictor variables were included. This model identified whether there was significant variation in residual reading and mathematics achievement scores at both the student ( $\sigma^2$ ) and school ( $\tau_{00}$ ) levels. The student- and school-level equations for the unconditional model are:

$$\begin{aligned} \text{Student : } Y_{ij} &= \beta_{0j} + r_{ij} \\ \text{School : } \beta_{0j} &= \gamma_{00} + \mu_{0j} \\ \text{Combined : } Y_{ij} &= \gamma_{00} + \mu_{0j} + r_{ij} \end{aligned}$$

The combined model demonstrated that the achievement score ( $Y$ ) of  $i$  student in school  $j$  was estimated as a function of the average achievement score ( $\gamma_{00}$ ) of school  $j$  plus the residuals at both the student ( $r_{ij}$ ) and school ( $\mu_{0j}$ ) levels. The residual at the student level represents the variation of student scores around the school mean, and the residual at the school level represents variation in average school scores around the total sample or ‘grand’ mean (Peugh, 2010). The second model, or “risk model,” included all individual risk predictors to determine their unique contribution to reading and mathematics achievement scores, controlling for poverty. The combined student- and school-level equation for the individual risk model is:

$$\begin{aligned} Y_{ij} = & \gamma_{00} + \gamma_{10}(\text{POVERTY}) + \gamma_{20}(\text{MALTREATMENT}) + \gamma_{30}(\text{LOW MATERNAL EDUCATION}) \\ & + \gamma_{40}(\text{HOMELESSNESS}) + \gamma_{50}(\text{INADEQUATE PRENATAL CARE}) + \gamma_{60}(\text{PRETERM/LOW BIRTH WEIGHT}) \\ & + \gamma_{70}(\text{LEAD EXPOSURE}) + \mu_{0j} + r_{ij} \end{aligned}$$

As all of the predictors included in the model were binary, no centering technique was utilized (Raudenbush & Bryk, 2002). Finally, each risk was tested as a random effect to assess whether the association with each achievement outcome varied across schools. The same sequence of models was conducted for cumulative risk using dummy variables indicating categories of cumulative risk including one risk, two risks, and three or more risks (zero risks was used as the reference group). Effect sizes for all predictors were calculated to quantify the standardized magnitude of the individual risk and cumulative risk category variables on reading and mathematics outcomes, while holding all other predictors constant. In order to assess whether these models fit the data better than the unconditional model, a chi-square difference test was conducted on the deviance statistic and parameters as degrees of freedom (Peugh, 2010). The Akaike Information Criterion (AIC) and Bayesian Information Criterion (BIC) are also reported as they are more conservative adjustments of the deviance statistic (e.g., accounting for the number of parameters in the model) (Singer & Willett, 2003).

#### 2.4.3. Mediating effects of academic engagement for African American boys

Mediation analyses were conducted to answer the last research question of the extent to which task engagement and school attendance mediated the relations between early risks and each educational outcome. The previous set of analyses determined whether each individual risk and cumulative risk

category was significantly associated with achievement outcomes. To test the mediation effect of the academic engagement variables, a final set of multilevel linear regression analyses was conducted for both reading and mathematics achievement that included the risk predictors (individual and cumulative risk, separately) and added both task engagement and attendance. As both of these academic engagement predictors were continuous, they were centered around the school mean (group-mean centered; Raudenbush & Bryk, 2002). The equation for the model testing the mediation effect of academic engagement on the relations between cumulative risk and achievement is:

$$Y_{ij} = \gamma_{00} + \gamma_{10}(POVERTY) + \gamma_{20}(ONE\ RISK) + \gamma_{30}(TWO\ RISKS) + \gamma_{40}(THREE\ OR\ MORE\ RISKS) \\ + \gamma_{50}(TASK\ ENGAGEMENT_{ij} - TASK\ ENGAGEMENT_j) + \gamma_{60}(ATTENDANCE_{ij} - ATTENDANCE_j) + \mu_{0j} + r_{ij}.$$

A fully mediated risk was evident when the parameter estimate for the originally significant risk variable dropped to at or near zero and was no longer significant. A partially mediated risk was determined if the parameter estimate for the risk variable decreased but did not fall at or near zero (Baron & Kenny, 1986). To test whether this model fit the data better than the final risk models, a chi-square difference test was conducted using the deviance statistic and number of parameters as degrees of freedom.

### 3. Results

#### 3.1. Achievement and cumulative risk gaps

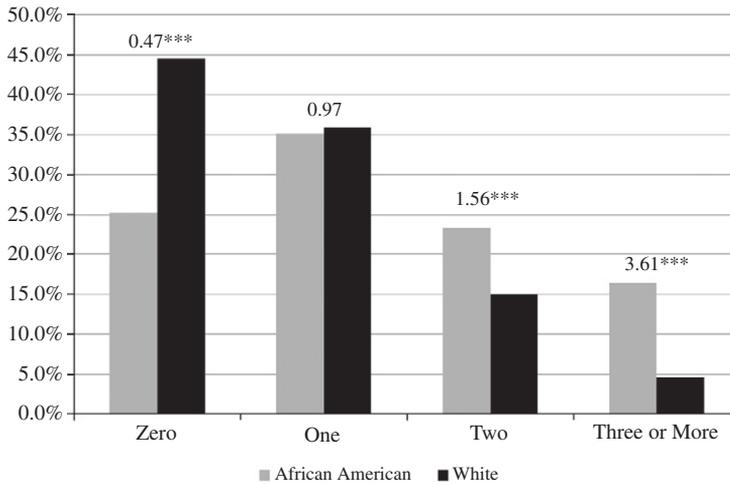
Table 2 shows the academic achievement gap between African American boys and White boys in third grade controlling for poverty status. Moderate effect sizes for state proficiency tests indicated that African American boys had significantly lower scores than White boys on reading achievement ( $d = -0.44$ ) and mathematics achievement ( $d = -0.59$ ). Comparable academic achievement disparities were found using the national assessment, TerraNova reading ( $d = -0.44$ ) and mathematics ( $d = -0.63$ ). Since these findings were consistent for state and national tests, the rest of the analyses used the policy-relevant state assessments as outcomes.

The results for cumulative risk also indicated a significant *risk gap* whereby African American boys evidenced a significantly greater number of risks than White boys (mean African American = 1.38 risks vs. mean White = 0.81 risks,  $p < .001$ ,  $d = 0.50$ ), while controlling for poverty. Fig. 1 provides an illustration of these differences at each category of risk. White boys had significantly higher rates of no risks than African American boys ( $OR = 0.47$ ,  $p < .001$ ). As the number of risks increased African American boys evidenced increasingly higher rates, as their odds of experiencing three or more risks was 3.61 times that of White boys ( $p < .001$ ). Table 3 presents the prevalence rates of individual risks for African American boys compared to White boys in this sample and according to national estimates. With the exception of low maternal education, African American boys experienced these risks at higher rates as compared to White boys. The highest prevalence rate among individual risk factors for African American boys was inadequate prenatal care followed by lead exposure, low maternal education, preterm/low birth weight, homelessness, and maltreatment. African American boys experienced these risks at far higher rates than the national population of children.

**Table 2**  
Average educational outcomes in third grade.

	African American boys	White boys	Effect size
PSSA reading	1246.51 (236.23)	1143.43 (226.52)	0.44
PSSA mathematics	1367.37 (240.06)	1228.11 (229.30)	0.59
TerraNova reading	618.41 (39.45)	601.34 (37.46)	0.44
TerraNova mathematics	590.51 (46.56)	563.51 (40.79)	0.63

Note. Effect sizes were obtained through Analysis of Covariance with the additional control of poverty. Standard deviations are presented in parentheses.



**Fig. 1.** Cumulative risk percentages for African American boys and White boys. Note. Values represent Odds Ratios. \*\*\* $p < .001$ .

### 3.2. Relations between risk and academic achievement for African American boys

The multilevel models examining the associations between individual risks and reading and mathematics achievement are presented in Tables 4 and 5. The variation in school intercepts in the unconditional model was significant for both achievement outcomes. Intraclass correlations ( $\tau_{00}/\sigma^2 + \tau_{00}$ ) indicated that 14.7% and 14.4% of the variation in scores occurred between schools for reading and mathematics achievement, respectively. Results from the risk models showed that African American boys who were maltreated ( $d = -0.22$ ), experienced high lead exposure ( $d = -0.12$ ), had mothers who did not graduate from high school ( $d = -0.13$ ), or mothers with inadequate prenatal care ( $d = -0.06$ ), demonstrated lower reading achievement scores. Children also exhibited lower mathematics achievement scores if they were maltreated ( $d = -0.22$ ), experienced high lead exposure ( $d = -0.13$ ), had mothers who did not graduate from high school ( $d = -0.11$ ), or were born preterm/low birth weight ( $d = -0.11$ ). Chi-square difference tests showed that the risk model fit the data significantly better than the unconditional model for both reading ( $\chi^2(9) = 151, p < .001$ ) and mathematics ( $\chi^2(9) = 137, p < .001$ ) achievement. The random effects models demonstrated that there was no significant variation between schools in the relations between each individual risk and both reading and mathematics achievement ( $p > .05$ ).

The results for the cumulative risk models are presented in Tables 6 and 7. Findings indicated that African American boys were at significantly higher risk for reading and mathematics underachievement as the number of risks increased. Compared to children who did not experience any risk, children with one ( $d = -0.10$ ), two ( $d = -0.23$ ), or three or more risks ( $d = -0.32$ ) had significantly lower reading achievement scores. Results were similar for mathematics achievement as African American boys

**Table 3**  
Individual risk percentages.

	African American boys	White boys	National
Child maltreatment	12.5	8.6	1.0
Low maternal education at birth	24.6	25.0	13.0
Homelessness	13.4	2.6	3.0
Inadequate prenatal care	39.0	21.3	3.5
Preterm/low birth weight	22.6	19.5	10.6
Lead exposure	26.6	4.3	7.2

Note. National percentages were obtained from the following sources: Center for Disease Control and Prevention, 2008; U.S. Department of Health and Human Services, 2011.

**Table 4**

The relations between individual risks and reading achievement for African American boys.

Parameter	Unconditional model		Risk model		Mediation model	
	Parameter estimate	SE	Parameter estimate	SE	Parameter estimate	SE
<b>Fixed effects</b>						
Intercept	1140.98***	8.12	1197.32***	10.72	1195.49***	10.47
Poverty			−39.93***	9.41	−23.70**	8.97
Maltreatment			−50.41***	12.79	−39.64**	12.02
Low maternal education at birth			−31.23**	9.80	−19.13*	9.21
Homelessness			4.61	12.46	11.31	11.68
Inadequate prenatal care			−19.29*	8.53	−21.17**	8.00
Preterm/low birth weight			−6.97	9.69	−0.03	9.10
Lead exposure			−27.28**	9.32	−24.14**	8.74
Task engagement					−2.19***	0.12
Percentage of attendance					1.78**	0.57
<b>Random effects</b>						
Intercept variance ( $\tau_{00}$ )	7647.76***	1229.10	6649.75***	1083.93	6371.24***	1069.81
Residual variance ( $\sigma^2$ )	44,380.12***	1228.62	43,537.83***	1207.74	38,164.15***	1058.97
<b>Model summary</b>						
AIC	37,858		37,707		37,362	
BIC	37,864		37,713		37,368	
Deviance statistic	37,854		37,703		37,358	
Number of parameters	3		12		14	

Note. \* $p < .05$ . \*\* $p < .01$ . \*\*\* $p < .001$ . SE = Standard Error.  $n = 2779$ . AIC = Akaike information criterion. BIC = Bayesian Information Criterion.

demonstrated lower scores if they had one ( $d = -0.13$ ), two ( $d = -0.25$ ), or three or more risks ( $d = -0.30$ ), as compared to children with no risks. As with the individual risk models, chi-square difference tests showed that the cumulative risk models fit the data significantly better than the unconditional model for both reading ( $\chi^2(4) = 123, p < .001$ ) and mathematics ( $\chi^2(4) = 107, p < .001$ ) achievement. Also the random effects model demonstrated that there was no significant variation between schools in the relations between each category of cumulative risk and both reading and mathematics achievement ( $p > .05$ ).

**Table 5**

The relations between individual risks and mathematics achievement for African American boys.

Parameter	Unconditional model		Risk model		Mediation model	
	Parameter estimate	SE	Parameter estimate	SE	Parameter estimate	SE
<b>Fixed effects</b>						
Intercept	1227.72***	8.12	1274.59***	10.72	1270.17***	10.48
Poverty			−28.76**	9.52	−9.48	8.97
Maltreatment			−52.41***	12.88	−38.83**	12.00
Low maternal education at birth			−26.02**	9.90	−12.98	9.21
Homeless			−0.05	12.54	7.41	11.64
Inadequate prenatal care			−2.41	8.61	−3.77	8.00
Preterm/low birth weight			−25.31**	9.78	−17.70	9.09
Lead exposure			−29.86**	9.42	−26.52**	8.74
Task engagement					−2.31***	0.12
Percentage of attendance					2.84***	0.57
<b>Random effects</b>						
Intercept variance ( $\tau_{00}$ )	7597.00***	1204.95	6755.71***	1108.33	6662.38***	1042.25
Residual variance ( $\sigma^2$ )	45,266.18***	1249.89	44,517.22***	1231.50	38,248.11***	1058.11
<b>Model summary</b>						
AIC	38,005		37,868		37,462	
BIC	38,011		37,874		37,468	
Deviance statistic	38,001		37,864		37,458	
Number of parameters	3		12		14	

Note. \*\* $p < .01$ . \*\*\* $p < .001$ . SE = Standard Error.  $n = 2786$ . AIC = Akaike information criterion. BIC = Bayesian Information Criterion.

**Table 6**

The relations between cumulative risk and reading achievement for African American boys.

Parameter	Unconditional model		Risk model		Mediation model	
	Parameter estimate	SE	Parameter estimate	SE	Parameter estimate	SE
<b>Fixed effect</b>						
Intercept	1140.98***	8.12	1201.49***	11.69	1195.49***	10.47
Poverty			−40.31***	9.39	−24.21*	8.95
Cumulative risk <sup>a</sup>						
1 risk			−24.05***	10.71	−13.94	10.06
2 risks			−53.55***	11.96	−36.44**	11.27
3 or more risks			−75.36***	13.45	−55.47***	12.66
Task engagement					−2.17***	0.12
Percentage of attendance					1.89**	0.57
<b>Random effect</b>						
Intercept variance ( $\tau_{00}$ )	7647.76***	1229.10	6734.62***	1087.64	6378.14***	1082.73
Residual variance ( $\sigma^2$ )	44,380.11***	1228.62	43,626.02***	1209.67	38,253.87***	1061.03
<b>Model summary</b>						
AIC	37,858		37,735		37,391	
BIC	37,865		37,741		37,398	
Deviance statistic	37,854		37,731		37,387	
Number of parameters	3		7		9	

Note. \* $p < .05$ . \*\* $p < .01$ . \*\*\* $p < .001$ . SE = Standard Error.  $n = 2779$ . AIC = Akaike information criterion. BIC = Bayesian Information Criterion.

<sup>a</sup> Reference category is 0 risk.

### 3.3. Mediating effects of academic engagement for African American boys

The models testing the mediating effect of academic engagement indicators on the relations between individual risks and academic achievement are presented in Tables 4 and 5. For reading and mathematics, African American boys with fewer task engagement problems and greater school attendance attained higher achievement scores ( $p < .001$ ). For reading, the findings also showed that these academic engagement indicators partially mediated the relations between all previously significant individual risks, and

**Table 7**

The relations between cumulative risk and mathematics achievement for African American boys.

Parameter	Unconditional model		Risk model		Mediation model	
	Parameter estimate	SE	Parameter estimate	SE	Parameter estimate	SE
<b>Fixed effect</b>						
Intercept	1227.72***	8.12	1201.49***	11.69	1274.32***	11.33
Poverty			−27.89**	11.83	−8.93	8.96
Cumulative risk <sup>a</sup>						
1 risk			−30.93**	10.83	−19.85*	10.07
2 risks			−58.45***	12.10	−39.19**	11.28
3 or more risks			−71.15***	13.57	−48.31***	12.64
Task engagement					−2.31***	0.12
Percentage of attendance					2.86***	0.57
<b>Random effect</b>						
Intercept variance ( $\tau_{00}$ )	7597.00***	1204.95	6532.40***	1086.42	6521.38***	1029.09
Residual variance ( $\sigma^2$ )	45,266.11***	1249.89	44,704.92***	1236.13	38,382.26***	1061.30
<b>Model summary</b>						
AIC	38,005		37,898		37,490	
BIC	38,012		37,904		37,497	
Deviance statistic	38,001		37,894		37,486	
Number of parameters	3		7		9	

Note. \* $p < .05$ . \*\* $p < .01$ . \*\*\* $p < .001$ . SE = Standard Error.  $n = 2786$ . AIC = Akaike information criterion. BIC = Bayesian Information Criterion.

<sup>a</sup> Reference category is 0 risk.

the mediating effect was most pronounced for maltreatment ( $d = -0.17$ ) and low maternal education ( $d = -0.08$ ). Comparing the effect sizes from the individual risk model and the mediation model, the addition of task engagement and school attendance decreased the relations between reading achievement and maltreatment by 23% and low maternal education by 38%. For mathematics achievement, these academic engagement indicators also showed a partial mediation effect by reducing the relations between achievement scores and maltreatment by 27% ( $d = -0.16$ ), low maternal education by 55% ( $d = -0.05$ ), and preterm/low birth weight by 36% ( $d = -0.07$ ). For African American boys, the inclusion of task engagement and school attendance made the associations between mathematics achievement and both low maternal education and preterm/low birth weight no longer significant ( $p > .05$ ). Chi-square difference tests showed that the mediation models fit the data significantly better than the individual risk models for both reading ( $\chi^2(2) = 345, p < .001$ ) and mathematics ( $\chi^2(2) = 406, p < .001$ ) achievement.

These academic engagement indicators also demonstrated partial mediating effects on the relations between cumulative risk and academic achievement for African American boys (see Tables 6 and 7). The inclusion of task engagement and school attendance reduced the relations between reading achievement and one risk ( $d = -0.06$ ), two risks, ( $d = -0.16$ ) and three or more risks ( $d = -0.24$ ). The results were similar for the mediating effects on the association between mathematics achievement and one risk ( $d = -0.08$ ), two risks ( $d = -0.16$ ), and three or more risks ( $d = -0.20$ ), as compared to no risks. For reading and mathematics achievement, the reduction in effect sizes across all categories of cumulative risk ranged from 25% to 40%. Chi-square difference tests revealed that the mediating models were significantly better fits to the data as compared to the cumulative risk models alone for both reading ( $\chi^2(2) = 344, p < .001$ ) and mathematics ( $\chi^2(2) = 408, p < .001$ ) achievement.

#### 4. Discussion

The current study was designed to address a major critique of the achievement gap research that presents a static, decontextualized set of comparisons between African American and White boys. The present research was guided by a developmental ecological model and situated within an intentional, community-based inquiry that involved a partnership among researchers, public educators, and public service providers in Philadelphia, the poorest of the 10 largest cities in the U.S. (U.S. Census Bureau, Population Division, 2007). The purpose was to make visible mutable, publicly monitored risks believed to be associated with “being behind” academically and protective factors related to resilience for an entire policy relevant subpopulation of African American boys. As such, this is the first study to comprehensively examine this set of policy-relevant risk and protective factors within a large city’s public education system where one out of every three children is an African American boy. This study involved the use of an existing citywide, integrated data system specifically designed to provide evidence for the improvement of policies and services for vulnerable subpopulations of children and youth. Risks that have been identified nationally as disproportionately affecting African American children were targeted and the distinctive relations between type and amount of risk and reading and mathematics achievement were examined within the subpopulation of African American boys. Also tested was the hypothesized protective, mediating effect of school district indicators of academic engagement on the relations between risks and reading and mathematics achievement.

##### 4.1. Achievement and cumulative risk gaps

Results from this study demonstrated significant achievement gaps in reading and mathematics for this cohort of African American and White boys, who were predominantly from low-income households. In fact, the Black–White achievement gap effect sizes for boys were nearly identical to those found at the national level for economically-disadvantaged boys enrolled in large public school districts (NAEP, 2009). In this study and nationally, there existed a Black–White achievement gap for boys of roughly half a standard deviation in both reading and math. These children, their families, and the public schools that educate them are in great need of understanding what is placing these African American boys so far behind their White counterparts in academic achievement.

This study hypothesized that the type and amount of publicly-monitored early risk experiences would uniquely contribute to the wide Black–White achievement gap for young boys. The first step in testing this

hypothesis was to determine whether African American boys were experiencing these early risks more than White boys. Comparisons of the overall amount of risks experienced revealed that the number of risks experienced by African American boys far exceeded that of White boys revealing a 'Black-White risk gap'. The magnitude of this risk gap was almost identical to the magnitude of the Black-White achievement gaps found in this study. Furthermore, the disparity between African American and White boys within categories of cumulative risk was substantial, with African American boys 3.6 times more likely to experience the highest level of risk than White boys. Statistical experts support making such effect size comparisons for educational interventions to determine whether they are successful in ameliorating important policy-relevant achievement gaps (Hill, Bloom, Black, & Lipsey, 2008; Konstantopoulos & Hedges, 2008). For this study, the comparison of the Black-White risk and achievement gaps demonstrates that the substantial disparity in academic achievement between these two groups is on par with the cumulative risk disparity.

The resulting prevalence rates for type of early risk experiences demonstrated that African American boys had higher rates for all but one of these publicly monitored risk included in this study as compared to White boys and these rates surpassed all national rates. For instance, African American boys were 1.5 times more likely to experience child maltreatment as compared to White boys, and this prevalence was much higher than the national rate of 1.5% for African American children (DHS, 2011). A considerable difference in prevalence of high lead exposure was found, with African American boys showing a rate over 6 times higher than that of White boys and more than triple the national prevalence for all children (Center for Disease Control and Prevention, 2008). Over 13% of African American boys had stayed in a homeless shelter before the end of third grade as compared to only 2.6% of White boys. These findings show that African American boys were disproportionately exposed to a wide set of early risk experiences, and corroborate previous findings regarding the disparity in risk experiences between African American children and White children (Flores & The Committee on Pediatric Research, 2010). This demonstrates the inadequacy of national estimates to provide a realistic picture of the challenges faced by these children and their families in Philadelphia.

#### 4.2. Type and amount of publicly monitored risks matter

The examination of the effects of these unique risk experiences showed that the nature of the risk experiences mattered for academic achievement among African American boys, and in some cases these risks operated differently for reading and mathematics. High lead exposure was significantly related to lower reading and mathematics achievement. This finding corroborates literature examining the effects of lead toxicity on children's educational well-being in the early school years, particularly cognitive outcomes (Lanphear, Dietrich, Auinger, & Cox, 2000; see Needleman & Gatsonis, 1990, for meta-analysis). A recent study also investigated the association between lead exposure and elementary state testing results and found comparable negative relations with both reading and mathematics (Miranda et al., 2007). Two of the health-related risks in this study—preterm or low birth weight and prenatal care—had negative associations with reading and mathematics, respectively. Consistent with previous research, preterm and/or low birth weight was associated with lower mathematics achievement (Goosby & Cheadle, 2009; Hack, Klein, & Taylor, 1995), particularly among African American children (Dombrowski, Noonan, & Martin, 2007). In addition, inadequate prenatal care related to worse reading achievement scores. These findings demonstrate that a physical risk to children's health—preterm and/or low birth weight—may be more associated with problem solving and executive functioning skills of brain development that have been shown to be highly concentrated in mathematics performance (Kilpatrick, Swafford, & Findell, 2001). Inadequate prenatal care may be an indicator of mothers who are not connected to public health services or who evidence other social barriers to engagement and participation. This could help explain why inadequate prenatal care demonstrated an association with interactive and engaged learning that is a strong component of reading activities (Hohmann-Marriott, 2009; Sunil, Spears, Hook, Castillo, & Torres, 2010).

Among the socio-familial risks, African American boys performed significantly worse on both reading and mathematics achievement tests at the end of third grade if they were maltreated or born to a mother who did not graduate from high school. These findings are consistent with previous work comprehensively examining the effects of socio-familial risks on academic achievement for all racial/ethnic groups (Rouse et al., 2011; Yeung

& Pfeiffer, 2009). Low maternal education decreases the likelihood that children and families will be connected to important social networks associated with employment opportunities and educational institutions. Barriers to these social networks have been shown to be associated with fewer early learning experiences for young children (Huston & Bentley, 2010). While economic disadvantage and low maternal education represents disconnection at the family–community levels, child maltreatment, the strongest predictor of low academic achievement in this study, is clearly a harmful disconnection at the *parent–child* level. This study supports the literature indicating that dysfunction of this vital transaction has serious negative consequences for academic achievement (Cicchetti, 2004; Crozier & Barth, 2005).

The findings of the effects of individual risk experiences were further supported by the examination of the association between cumulative risk and academic achievement. Compared to having no risk experiences, African American boys who experienced one, two, or three or more risks demonstrated significantly lower reading and mathematics achievement. The most detrimental effect on achievement was seen for African American boys with three or more risks. These results also align with prior research examining the effects of multiple risks on academic achievement for children (Lanza, Rhoades, Nix, & Greenberg, 2010; Rouse et al., 2011; Sameroff, Seifer, Baldwin, & Baldwin, 1993).

This study represents a contribution to the literature focusing on risk experiences and academic achievement among African American boys. Placing educational intervention impact findings in the context of the Black–White risk and achievement gaps could help explain why programs do or do not work for subgroups of children. The Early Head Start Research and Evaluation Project considered the risk experiences of children in determining effectiveness during the program and after the program through fifth grade. The study found that Early Head Start did not show positive effects for children in the highest risk category and that for this group of children their outcomes were worse across time. By fifth-grade follow-up, “six impacts were statistically significant...all of which favored the control group” (Vogel, Yange, Moiduddin, Kisker, & Lepidus Carlson, 2010, p. 22). These findings demonstrate that the adverse experiences of this subgroup of children (disproportionately African American boys as shown in this study) make it much more difficult for large-scale intervention programs such as Early Head Start to affect the educational well-being of young children. What is needed is a deeper understanding of the specific risk experiences that hinder educational well-being such that comprehensive interventions serving young African American boys are able to target necessary program services to children most vulnerable to school failure.

Given that it is the first study to comprehensively examine this large set of policy-relevant risks within the population of African American boys in a large urban community, the present research on risks had two major limitations that could be addressed in future research. Findings indicated that 40% of the African American boys in this population experienced more than one risk. The first step in this line of research was to examine the effects of simply the presence or absence of a risk experience on academic achievement without a careful look at the nature of the risk experiences. The next research in this area should take a more detailed look at how characteristics of these risk experiences (e.g., timing and frequency of the risk experiences, type of child maltreatment) relate to academic achievement for African American boys. Furthermore, this study only examined which risks were uniquely related to academic achievement; it did not examine different combinations of risk experiences. Future research should investigate the interactions among risk experiences as they associate with academic achievement and engagement. Nonetheless, this study laid the groundwork in determining that not all African American boys are experiencing the same levels of risk. Significant variation in risk experiences was found as it related to academic achievement, and to simply classify children as high or low performing on academic achievement indicators based on racial groupings is uninformative for educational policy.

#### 4.3. Academic engagement contributes to resilience

Findings from this study also demonstrated that African American boys with higher levels of academic engagement—as measured by attendance and task engagement—performed significantly better on both reading and mathematics tests after accounting for the effects of early risk experiences. Notably, these indicators of academic engagement were found to partially mediate the significant detrimental effects of parent–community (low maternal education), parent–child (child maltreatment) disengagement and preterm or low birth weight risks on reading and mathematics achievement. The estimated effect sizes for risk experiences on reading and mathematics were reduced by one quarter to over one half due to the

inclusion of these academic engagement indicators. Additionally, in the examination of cumulative risk, this study revealed that these engagement indicators reduced the relations between *all* levels of cumulative risk and reading and mathematics achievement.

These results indicated that African American boys who experienced early risks, particularly those representing disengagement at the parent–community and parent–child intersections, demonstrated lower school attendance and task engagement. This work is consistent with previous studies that have shown that early maternal and family risk experiences such as low parental education and child maltreatment are associated with chronic absenteeism (Romero & Lee, 2008) and lower academic engagement (Rouse et al., 2011) in the early elementary years. Furthermore, findings from this study corroborate previous academic engagement literature demonstrating that children's academic performance can be greatly improved through consistent school attendance (Applied Survey Research, 2011; Chang & Romero, 2008; Gottfried, 2011) and positive academic engagement (Alexander, Entwisle, & Horsey, 1997; Howse, Lange, Farran, & Boyles, 2003). However, very few studies have examined the mediating role of these important academic engagement indicators on the relations between early risk experiences and academic achievement, particularly for African American boys. Studies of late elementary and secondary school African American males have found that critical thinking skills (Gutman, 2006) and self-regulation and academic self-confidence (Shumow, Vandell, & Posner, 1999) lessened the direct effects of living in poverty and high-crime neighborhoods. Matthews et al. (2010) recently examined how learning-related skills help to explain the relations between family socioeconomic status, home literacy environment, and academic achievement for elementary-aged African American boys and confirmed our findings of the mediating influence of academic engagement indicators.

Our study extends this current body of literature by demonstrating that *within* a population of young African American boys in a large urban school district, school attendance and task engagement have the ability to greatly influence the relations between early risk experiences—beyond poverty—and early academic achievement. This finding helps to move beyond a story of risk and underachievement by shining a light on an area in which schools can buffer the negative effects of early risk experiences for African American boys. “Engagement is malleable: it is presumed to be a function of both the individual and the context.... Moreover, engagement can result from a variety of antecedents in the context, both social and academic, at both the school and classroom levels, allowing for a wide range of intervention targets...” (Fredericks, Blumenfeld, & Paris, 2004, pp. 82–83). Though teachers, school psychologists, and the educational system as a whole can do little by themselves to prevent or treat early risks such as child maltreatment or low maternal education, they can directly intervene to enhance academic engagement through the provision of emotional and instructional support, and thereby lessen the negative effects of early risk experiences on academic achievement. Thus, by using evidence-based interventions that have been successful in improving academic engagement such as Positive Action and Caring School Community (Institute of Education Sciences, 2007), schools can promote resilience among young African American boys. These findings emphasize the importance of future research that can further inform our understanding of the variability within the population of African American boys and ways in which we can learn more about areas of resilience.

The current study was limited to an investigation of only attendance and task engagement as broad indicators of overall academic engagement and did not differentiate their influence. Future research should disentangle the specific pathways by which these two academic engagement indicators mediate the relations between each individual risk and academic achievement. This could provide more precise knowledge regarding the unique and relative benefits of targeting each of these engagement indicators for intervention. Additionally, the selection of engagement indicators did not include information about the nature of the transactions between the home and school environments or those between teachers and African American boys in the classroom. Beyond the attendance indicator, family engagement in the child's schooling experience should be examined more closely for families of African American boys. Reviews of the research literature indicate that family engagement is an important protective factor for African American children experiencing risks to their educational well-being worthy of further study (Boethel, 2003; Fantuzzo, McWayne, Perry, & Childs, 2004; Jeynes, 2003). A more in depth look at academic engagement would also include a close examination of the nature of the teacher–student interactions in the classroom. There is a growing research literature indicating that the nature and amount of teachers' developmentally appropriate support for students' academic engagement are associated with academic achievement levels (Hamre & Pianta, 2005; Howes, 2000).

#### 4.4. Implications for civic action and more inclusive inquiry

The model, design, and findings of this research provide actionable intelligence to put us on a path to close the achievement gap for African American boys. Four decades of persistent and seemingly intractable achievement gaps for African American boys have made advocates for change frustrated by comparison statistics. In a chapter entitled “What Do We Do Now? Toward a Brighter Future for African American Men,” Edelman (2008) asserts that inquiry that is race-neutral and place-neutral will not result in effective change. He calls for collective civic action where race, gender, and place matter and where we prioritize connecting African American boys to positive school experiences. The present research squarely addressed this charge by focusing on a subpopulation of African American boys drawn from the cohort of third-grade students taking standardized achievement tests for the first time in Philadelphia. It first indicated that the Black–White achievement gap was accompanied by an equally compelling Black–White *risk gap* of the same magnitude. It then went on to use a developmental ecological model to conduct an explicit inquiry of the variability within this important subgroup to further our understanding of how different types of experiences in their home and school environments either impede or enhance their achievement outcomes. As such, the efforts were designed to increase our knowledge of what was happening within this subpopulation.

Not only do race and gender matter but so does *place*. This research was intentionally situated within a large urban community where a high percentage of African American boys is living in impoverished neighborhoods and represents a substantial portion of the student body in the public schools. In this place, the research was designed to capitalize on an existing partnership among the public school district, public health and human service agencies, and a university to use integrated administrative data to conduct research for vulnerable subgroups of children in the municipality. It featured the use of a built integrated data system. This built system represents an intentional civic action to bring school district leaders together with leaders from relevant public service agencies to share data to inform child and youth policies within this municipality; here the collaboration addressed one of the major priorities of the community, the educational well-being of its African American boys. The School District of Philadelphia leadership recognized that there are many factors hindering the success of its primary mandate to promote learning and achievement for *all* its students. The health and welfare risks of children and families that are publicly monitored by municipal service agencies were identified as possible contributors to “what’s behind being behind.” This research represents a national movement in education to develop integrated longitudinal data systems to provide capacity for data-based decision making ([Data Quality Campaign, 2009, 2010](#)). The value of integrated data systems in states and municipalities is that they can foster conjoint inquiry, which opens up the possibility for shared responsibility and evidence-based integrated services informed by what is learned from studies such as the present one.

The findings from the present study indicate significant *disconnects* and *connects* in the academic achievement of African American boys that school and public service leaders must address. The inclusion of mutable, hypothesized risk and protective factors reflects three systems of influence from a developmental ecological model that can be foci for change. First, at the community-level, interagency collaboration can provide a comprehensive understanding regarding the impact of publicly monitored risks. The identification of risks associated with achievement provides an opportunity to prioritize schools with the highest concentrations of African American boys with these risks for specialized services. Here we recognize that place matters and that service agencies will be most effective if they direct their service dollars, expertise, and collaborative effort to areas with greatest needs. This provides an opportunity for them to partner with school leadership to generate and test effective prevention and intervention programs for these school communities to better support the educational well-being of African American boys. Second, substantial attention at the school level should be directed to enhancing family engagement in the boys’ educational experiences. In addition to ensuring consistent attendance, home–school collaborations can improve the communications between parents and teachers and provide families with more opportunities to contribute to their children’s positive learning experiences. Third, at the most proximal level of schooling—the classroom—we have opportunities to intentionally increase the academic engagement of African American boys. Here we strive to increase the amount of emotional and instructional support that African American boys receive in the class by teacher–student interactions. Professional development for teachers is needed that both increases understanding about how race and

gender matter in the classroom and provides teachers with strategies to improve their interactions with African American boys.

The present research provided objective evidence of risk and protection for a subpopulation of African American boys in public education in a large urban school district. This type of empirical research was designed intentionally to make race, gender, and place matter and is necessary, but not sufficient, to foster sustainable change and hope. In addition to making visible important relations among mutable variables associated with academic achievement, we need to make audible the voices of African American boys and their families through state-of-the-art qualitative research methods (Anderson, 2008; Ladson-Billings, 2004). Many leading researchers in the social sciences have demonstrated the value of surfacing the phenomenology of African American boys and their families (Howard, 2008; Spencer, Dupree, Cunningham, Harpalani, & Munoz-Miller, 2003). Adding their voices will make our inquiry of this phenomenon deeper and more inclusive. Careful study of the lived experiences of boys and families who are being unjustly excluded from opportunities due to racism and discrimination will provide us with a more honest picture of the institutional barriers that are perpetuating disadvantage and underachievement. Furthermore this type of inquiry holds great promise for countering prevailing deficiency narratives by manifesting stories of the resiliency and creativity of boys and families who “beat the odds” (Harper, 2010). The present study produced evidence to draw attention to the needs and strengths of African American boys and families. It is intended to stimulate discussion and foster hope for deeper and more inclusive inquiry, an inquiry which will result in collective civic action and measurable achievement for African American boys.

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