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The impact of after-school childcare arrangements on the developmental outcomes of low-income children

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ABSTRACT

Even though after-school programs (hereafter ASPs) and other types of childcare arrangements have long been implemented, childcare for school-aged children remains a patchwork made up of ASPs, relative care, parental care, and self-care, also with many families opting to use some combination of these types of care. Few studies, however, have examined the impact of various childcare arrangements for school-aged children aside from those focused substantially on ASPs.

This study aims to examine how five different after-school childcare arrangements, ASPs, relative care, parental care, self-care, and combinations of care, are related to the academic and behavioral outcomes among low-income, school-aged children.

The present study utilized data from the National Household Education Survey Programs: after-school programs and Activities (2005) (NHES: ASPA). Multivariate logistic regressions were conducted using 717 low-income households with children who utilized one of five childcare arrangements. Children's academic performance—academic scores and whether having schoolwork problems or not—and their behavioral outcomes that included whether having behavioral problems or not and whether having experience of suspension, detention, or expulsion, were examined.

Findings from the study indicate that, compared to children in ASPs, those in relative care and parental care had better academic performance (fewer schoolwork problems). Parental care was also positively associated with children's behavioral outcomes (fewer behavioral problems).

The study demonstrates that relative and parental care have a more positive association with children's developmental outcomes, compared to ASPs. Based on the study findings, practice and policy implications are discussed for low-income children's development. Several methodologies are also suggested for future research.

1. Introduction

After-school programs (ASPs) were originally started in the early 1900s for the supervision and safety of children living in unsafe and poor communities, and they were further implemented to meet the need of growing maternal employment in the1940s. ASPs have gained attention for improving children's development and the improvement of the quality of their program activities (Lauer et al., 2006). Numerous studies have found that high quality ASPs have a significant and positive effect on children, especially when the children are most at-risk of poor developmental outcomes (Caughy, DiPietro, & Strobino, 1994; Hagekull & Bohlin, 1995; Posner & Vandell, 1994; Riggs & Greenberg, 2004; Roffman, Pagano, & Hirsch, 2001). ASPs are also helpful for children from low-income families, who do not have as many opportunities to participate in extracurricular activities or enrichment programs as those from middle/higher income families. Through providing after-school services and programs in the community, ASPs enable economically disadvantaged children to participate in various activities (e.g., group discussion, structured recreation, homework help) that would otherwise not be available (Little, Wimer, & Weiss, 2007).

Other than ASPs, there are other types of after-school childcare arrangements for school-age children between 5 and 13 years old, depending on family income, household composition, and state of residence (Lawrence & Kreader, 2006; Sonenstein, Gates, Schmidt, & Bolshun, 2002). Based on the data from the 2005 after-school programs and Activities of the National Household Education Survey (ASPA-

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NHES: 2005),[1] among all the children in out of school childcare arrangements, the majority (60%) are cared for by a parent during most or all of their out of school hours. In addition to parental care, the most common types of care for out of school hours are center- or school-based programs (20%), care by a relative other than a parent or older sibling (15%), self-care (12%), non-relative or neighborhood-care (6%), and finally various activities under a certain type of supervision (7%) (Lawrence & Kreader, 2006). Some children (around 32%) are in more than one care arrangement (i.e., some combination of care) (Lawrence & Kreader, 2006).

Even though many school-aged children are in different types of childcare arrangements, there has been a dearth of research examining non-school or informal after-school arrangements (Goyette-Ewing, 2000), compared to plentiful studies about ASPs. For example, only a handful of studies have investigated outcomes of different types of care; in particular, self-care, adult-supervised care and some combination of care. This distribution of research might cause people to assume that ASPs are the most important care type, which is not necessarily the case. Knowing that more than half of American school-aged children are engaged in after-school care arrangements other than ASPs, it is important to understand how the different types of care arrangements affect children and their families. The examination of the different types of arrangements will not only help assist families in making effective care choices, but will also help promote the well-being of low-income communities (Riggs & Greenberg, 2004). Therefore, the purpose of this study is to examine whether school-aged children from low-income families display different academic and behavioral outcomes based on different after-school childcare settings. Through employing two theoretical frameworks, Bloom's model of learning theory and Bandra's social cognitive theory, locating the most recent outcomes of different types of after-school childcare services would offer insightful ideas for educators, school social workers, and policy makers whose concern is the developmental areas of low-income children.

2. Different types of after-school childcare arrangements

2.1. Unstructured care arrangements

2.1.1. Parental care arrangement

This care arrangement is the type where children stay with one of their parents during out of school time (Sonenstein & Wolf, 1991). Parental care shows less flexibility and fewer working hours than care by others because both parents are constrained in their availability for childcare by their work outside the home (Hochschild & Machung, 1990).

2.1.2. Relative care arrangement

Children in this care arrangement are taken care of by their grandparents, older siblings, uncles, or anyone related to them in either the parents' or relative's home (Swenson, 2013). Nationally, 52% of the time the caretakers are the children's grandmothers (Christensen, Schneider, & Butler, 2011).

2.1.3. Self-care arrangement

Children are responsible for themselves without adult supervision (Lawrence & Kreader, 2006), or older children take care of themselves and their younger siblings during parental absence (Christensen et al., 2011).

2.1.4. Combination of care arrangement

Children are attending more than one type of childcare types. Combinations involve more supervised childcare arrangements for higher SES children and also involve more relative care for lower SES children (Pettit, Laird, Bates, & Dodge, 1997).

2.2. Structured care arrangements: after-school programs (ASPs)

ASPs have been significantly studied in terms of: the quality of programs and instructors/staff, partnerships with school, community institutions, and families, and the different types of programs offered (Little, Wimer, & Weiss, 2008). First, high quality ASPs provide a structured, safe, and supervised setting (U.S. Department of Education, 2000). The quality of programs is characterized by such critical factors as: safe and healthy climates; warm, attentive, well-prepared, highly trained professional staff; a low child-to-staff ratio (Little et al., 2008); and large quantities of program materials and activities (Campbell, Ramey, Pungello, Sparlin, & Miller-Johnson, 2002; Reynolds, Temple, Robertson, & Mann, 2001; Roffman et al., 2001). Qualified instructors are likely to encourage students to obtain specific skills and frequently provide effective feedback and guidance during activities (Little et al., 2007).

Second, partnerships with families, communities, and schools create high quality programs for children's development by providing additional resources (U.S. Department of Education, 2000; Little et al., 2008). Involved programs are likely to design fun and culturally relevant activities and climates that better capture participants' interests. Good programs take special notice of working parents during design and implementation (e.g., accommodating family schedules, affordability, and transportation) (U.S. Department of Education, 2000). Strong relationships with schools result in an increase in participants' homework completion rate, positive behavior, and increased initiative, staff engagement, and access to school facilities (Intercultural Center for Research in Education & National Institute on Out-of-School Time, 2005).

Finally, there are two types of ASPs—community-based and school-based programs (Committee on Community-Level Programs for Youth, 2000). Community-based programs are implemented by community organizations, such as the YMCA/YWCA, 4-H, libraries, sports organizations, or ethnic cultural organizations (Committee on Community-Level Programs for Youth, 2000). The goal of community-based programs is to provide opportunities for holistic youth development in addition to academic achievement (Brecher, Brazill, Weitzman, & Silver, 2009). They have grown in popularity through initiatives of the No Child Left Behind (NCLB) Act (U.S. Department of Education, 2000). Most participants in school setting are academically disadvantaged or minority children showing lower levels of math and/or reading (Casserly, 2004). As a result, school officials take after-school hours into consideration for improving academic subjects for disadvantaged students by providing convenience, instruction, and resources such as computer labs and books (Brecher et al., 2009).

3. Theoretical frameworks

3.1. Bloom's model of learning theory

According to Bloom's theory, there are three elements that affect students' learning: cognitive entry behaviors, affective entry characteristics, and the quality of instruction (Burns, 1996). Bloom emphasizes that "the cognitive and affective outcomes of instructions act as the cognitive entry behaviors and affective entry characteristics for the next component of instruction" (Burns, 1996, p. 331). Therefore, students who initially receive a low quality of instruction will have less success with subsequent topics related to their initial quality of instruction. Students with a high quality of instruction do not suffer from the compounding issues of those with a lower level of instruction, and

[1] NHES in the U.S. Department of Education provides descriptive data of the educational activities of the U.S. population. The NHES surveys include all ages from early childhood to school age through adulthood. The most recent data file in 2012 consists of Parent and Family Involvement in Education and Early Childhood Program Participation (National Center for Education Statistics, 2015a). However, the most recent descriptive information of school-aged children is collected in 2005 (National Center for Education Statistics, 2015a).

instead will approach new problems with confidence and motivation, as they will have a better grasp on the prerequisite items required for the new unit of instruction (Burns, 1996).

Additionally, the learning environment should offer places for children's academic improvement (Catanta, 2005). In structured educational settings, although children may make errors in solving math problems, they usually receive frequent feedback and explanations from instructors, which assists them in developing math and problem-solving skills (Siegler & Shrager, 1984). In academic settings, children's instructional practice and amount of time spent studying academic subjects influence the higher levels of children's accuracy in math (Cahan & Cohen, 1989). All in all, Bloom's model suggests that high quality ASPs that contain structured lessons, educational materials, and regular feedback from instructors/staff would have a stronger positive impact on participants' academic development than unstructured childcare arrangements (e.g., relative, self, parental-care).

3.2. Social cognitive theory

According to social cognitive theory (Bandura as cited in Asendorpf, 1996), children's social experiences influence how they mentally represent their social worlds and process social information. In other words, children's cognition directs their display of social behavior. Infants and small children learn—and eventually internalize—certain behavioral patterns through compliance with parental rules. "Practicing" rule compliance is a major stage in the development of self-regulation because children display efforts to control their own behavior (Gifford, 2001). However, the process of internalizing socially accepted behaviors does not progress smoothly from childhood to adulthood because individuals' ability to create intentional and goal-directed actions are significantly influenced by social relationships in their environments and by cognitive changes that affect individual behavior (Asendorpf, 1996).

Social cognitive theory suggests that in order to provide proper programs for children who display behavioral problems, altering environmental conditions is promising. Specific programs should be developed for both family and school and/or community settings. One successful family involvement is teaching parents to reduce their aversive treatment/harsh discipline while consistently punishing aggression with time out (isolation) and encouraging them to reward their children for acceptable social behavior (Patterson as cited in Perry, 1996). An appropriate school intervention involves increasing teachers' and peers' awareness of bully/victim problems, developing clear rules against aggressive behavior, and providing support and protection for victimized children (Olweus as cited in Perry, 1996).

Social cognitive theory also recommends that it is effective to instruct children with behavioral problems in school or community settings with cognitive strategies designed to reduce aggression (teaching them to avoid assuming that others are acting with hostile intent, to be aware of the harmful consequences of aggression, to think of nonaggressive solutions to conflict) (Perry, 1996). Children who present behavioral problems are likely to have more opportunities to be given proper instruction and adequate social strategies within the plentiful resources in ASPs, than those who do not participate in ASPs or only participate in unstructured arrangements. Therefore, attending high quality ASPs can be beneficial for children who are more aggressive, or display antisocial behaviors, and can allow them to learn more acceptable behaviors.

4. Empirical studies: child development in after-school childcare arrangements

There are some significant findings on school-aged children's academic and behavioral areas by different types of childcare arrangements. The majority of studies indicated that structured high quality ASPs were more likely to lead to better academic (Birmingham, Pechman, Russell, & Mielke, 2005; Lauer et al., 2006; Little et al., 2007; Mahoney & Cairns, 1997; Posner & Vandell, 1994; Reisner, White, Birmingham, & Welsh, 2001) and behavioral outcomes (Brecher et al., 2009; Carter, Straits, & Hall, 2006; Durlak & Weissberg, 2007; Goldschmidt, Huang, & Chinen, 2007; Little et al., 2008; Philliber, Kaye, & Herrling, 2001; Weiss & Nicholson, 1998) for participants than unstructured childcare arrangements, including self-care and neighborhood-care. However, some of the findings are mixed. Howie's (1996) study of 231 third and fourth grade children in inner-city schools discovered that there were no significant differences between ASPs, relative, and parental care on children's behavioral areas; and furthermore in a study of 585 families in three cities, Pettit et al. (1997) indicated that relative care showed better academic outcomes than ASPs.

4.1. Academic development

4.1.1. Parental care arrangement

In a study of 150 children from suburban elementary schools, Vandell and Corasaniti (1988) found that there were no differences in academic levels when comparing school-aged children in mother-care, self-care, and adult-care. However, children in ASPs improved their academic outcomes (math, verbal, and reasoning competence), compared to the remaining three types of childcare arrangements. In comparing children of working mothers using center-based care (ASPs) to children of working mothers who cared for their children out of school hours and children of non-working mothers, Howie (1996) found that there was no difference on academic achievement for children with working mothers in maternal care and children in ASPs. When comparing maternal care with working mothers and maternal care with non-working mothers, once again, there was no difference between the two groups.

4.1.2. Relative care arrangement

Pettit et al. (1997) examined school-aged children's academic outcomes in different types of care including relative care, self-care, neighborhood-care, and ASPs (school-based programs) with the conditions of whether children came from higher or lower SES homes. There was no significant association between SES, relative care, and academic levels, except that lower SES children in relative care had better academic achievement than lower SES children who were in self-care, neighborhood-care, and ASPs.

4.1.3. Self-care arrangement

In a study of 260 children in either self-care or adult-supervised care (parental, relative, or neighborhood-care) in their childhood, Woodard and Fine (1991) found that there were no statistically significant differences between two different types of care on participants' academic outcomes. However, Vandell and Corasaniti (1988) using 150 third graders from White, predominantly middle-class suburban schools, found that children in high quality ASPs showed more academic improvement than children in either self-care or adult-care. No difference was found between self-care and adult-care, consistent with Woodard and Fine's (1991) study, Pettit et al. (1997) found that numbers of hours per week in self-care also was an important factor for participants' academic outcomes. For instance, children involved in self-care more than 4 h per week displayed lower levels of social competence and academic achievement than children in self-care for less than 4 h per week. In addition, boys in self-care were also likely to display poorer academic performance than girls in self-care (Howie, 1996).

4.1.4. ASPs

Several studies (Evaluation of the school-based TASC programs, and the national evaluation of the 21st Century Committees Learning Center Programs) found that children from elementary school to middle school in these specific programs improved their academic performance (in particular, math and reading) over the 2nd year and school attendance (Little et al., 2007) over counterparts who were not in the programs.

Children in high quality programs with various stimulating activities, such as academic enrichment, homework assistance, the arts, and recreation, performed better on math test scores and had better high school attendance rates (Birmingham et al., 2005; Reisner et al., 2001). Participants in high quality ASPs that provided hands-on activities, academic skill-building activities, leadership skill activities, and homework help were more likely to improve their school attendance. These students also had lower suspension rates, saw some improvement in their grades and test scores (Little et al., 2008), and decreased their school dropout rates (Mahoney & Cairns, 1997).

The ASPs that solely focus on academic areas in the program did not result in expected academic improvement. Rather, balancing a variety of structured extracurricular activities with engagement and fun was more helpful and effective in bolstering participants' academic performance (Little et al., 2008). Generally, children attending structured ASPs showed better grades than children in parental care or informal adult supervised arrangements (Posner & Vandell, 1994).

4.2. Behavioral development

4.2.1. Parental care arrangement

Vandell and Corasaniti (1988) compared behavioral outcomes for children in parental care to the outcomes for children in other adult-care, in self-care, and in ASPs. They found that while there were no significant differences between school-aged children in parental and adult-care, only children having less interaction with peers in ASPs showed lower levels of negative conduct problems, compared to adult-care or self-care.[2] However, in comparing care outcomes for ASPs and parental care in families with non-working mothers and both part- and full-time working mothers, Howie (1996) found that there were no significant differences in children's levels of anxiety, social status, and life skills competence based on care type.

4.2.2. Relative care arrangement

Pettit et al. (1997) found that low-income school-aged children in relative care, ASPs, and adult-supervised care displayed fewer behavioral problems than low-income school-aged children who were not involved in any type of care.

4.2.3. Self-care arrangement

Utilizing a pilot study, Diamond, Kataria, and Messer (1989) found that children who stayed at home alone, or were with their older siblings under 17 years old but unsupervised by adults, were more likely to display and acknowledge their behavioral problems than children who were supervised by a person older than 17 years of age. However, this study did not take race/ethnicity and SES into consideration. Additionally, the sample size was very small; therefore, these outcomes need to be interpreted with caution. Posner and Vandell (1994) also detected that children in self-care or in informal adult supervised arrangements displayed more problems with antisocial behavior than children attending ASPs. However, the outcome of this study is difficult to generalize since the study looked at childcare in rural areas, and both ASPs and parental care may differ in rural and urban areas (Posner & Vandell, 1994).

Some studies comparing self-care and adult supervised childcare discovered that there were no significant differences in social adjustment and behavioral improvement for children from low- and middle-income households (Rodman, Pratto, & Nelson, 1985; Woodard & Fine, 1991). Additionally, when Pettit et al. (1997) compared self-care in higher SES children and lower SES children, they found that higher SES children did show more externalizing problems (e.g., acting out) than lower SES children independent of the number of hours per week[3] they stayed alone. However, Vandell and Ramanan found that self-care children from lower SES homes displayed higher levels of externalizing problems than their higher SES counterparts at comparable levels of self-care use (as cited in Pettit et al., 1997), and using self-care at a younger age (comparing grades 1 and 3 with grade 5) appeared to correlate to a long-term risk of behavioral adjustment problems. Other than the SES condition, Diamond et al. (1989) found that boys in self-care displayed more significant behavioral problems than girls in self-care. Despite some differences in study outcomes, it was apparent that low-income children and children with existing behavioral and academic problems experienced worse outcomes from self-care than from relative, parental, or ASP care (Pettit et al., 1997). However, not all studies found negative aspects of self-care. Goyette-Ewing (2000) indicated that older children in self-care increased responsibility for themselves, which led them to be more independent and self-reliant than adult supervised children.

4.2.4. ASPs

A great deal of research found that children who attended structured high quality ASPs (treatment groups) avoided many behavioral problems, such as drug and alcohol abuse, delinquency and violent behavior, sexual activity, juvenile crime, and had increased safe sex knowledge as opposed to those who did not attend the specific programs (control groups) (Brecher et al., 2009; Little et al., 2008). Children benefitted from being supervised by trained staff and enrichment activities during after-school time instead of being alone or being in neighborhood-care. For example, participants in the *Children's Aid Society Carrera Adolescent Pregnancy Prevention Program* experienced fewer pregnancies, reduced teen sex, and less drug abuse (Philliber et al., 2001). Girls in the *Girls Inc.'s Friendly PEERsuasion Program*, which had a structured curriculum and activities for preventing substance abuse, displayed positive outcomes of avoiding the onset of alcohol use and similar situations (Weiss & Nicholson, 1998). Children in *Project Venture*, which offered skill-building, community service, leadership opportunities, and outdoor learning activities, reduced their substance use over time (Carter et al., 2006). Similarly, participants in *LA's BEST Programs on Juvenile Crime* from 1994 to 2003, lowered their rates of juvenile crime (Goldschmidt et al. 2007). Durlak and Weissberg's (2007) meta-analytic study also observed that ASPs who employed evidence-based skill training approaches were effective in increasing children's self-efficacy/self-esteem and school performance while reducing aggressive behavior and lessening their likelihood of drug abuse. Lastly, children with behavioral problems, who attended ASPs (i.e., Safe Haven Program) more frequently than children who did not,[4] displayed improvement in work habits in the classroom, better school attendance, and less-aggressive strategies to resolve conflicts with peers. This indicated that program attendance rates played a pivotal role in improving children's attitudes toward school in general (Pierce & Vandell, 1999).

Overall, children in structured ASPs showed better work habits and peer relationships than children in informally supervised after-school settings. They also displayed better emotional adjustment than those who were in either parental care or informal arrangements (Posner & Vandell, 1994). Regarding the question of this study, whether children's academic and behavioral outcomes would differ with the five types of after-school childcare arrangements—ASPs, relative, self-, parental, and combination care, this study begins with a hypothesis that children in ASPs will show better academic and behavioral outcomes than those who are in the other types of childcare arrangements. This hypothesis

[2] There was no further explanation of how children's parents decided the choice of care types which means, as Vandell and Corasaniti (1988) explained, there might be a selection bias. Children in ASPs would have more behavioral problems than children in the other types of care; therefore, their parents wanted to send these children to ASPs so that they would have more interactions and supervision from adults in ASPs.

[3] The average hours per week of 1st graders, 3rd graders, and 5th graders were respectively 10.9, 19.1, and 53.2 h.

[4] The participation of Safe Haven Program was measured by reports of the number of days that children attended the program. Researchers examined the attendance days in the reports by means, standard deviations, ranges, and medians (Pierce & Vandell, 1999).

was developed by the extensive studies as to the quality of structured ASPs, the positive outcomes of ASPs on children's development, and two theories of Model of Learning Theory as well as Social Learning Theory.

5. Methodology

5.1. Data and sample

"The National Household Education Surveys Programs: after-school programs and Activities" (2005) (NHES: ASPA) was developed by the National Center for Education Statistics (NCES) within the U. S. Department of Education by incorporating random-digit-dial (RDD) telephone surveys of households in the U.S. from January 3 through April 24, 2005, to collect information for the 2004–05 school year only (National Center for Education Statistics, 2015b). NHES: ASPA is a nationally representative survey which collected information about school-aged children in preschool/kindergarten through grade eight (middle-school children ages up to 15) in the 50 states and District of Columbia (Carver, Iruka, & Chapman, 2006). NHES has collected information relevant to school-aged after-school childcare arrangements three times, in 1999, 2001, and 2005. All of the data surveys were collected separately from one another, and therefore were not longitudinal in nature, but cross-sectional.

The survey content was designed by the NCES staff through carefully consulting with experts in academic and research institutions as well as government agencies to obtain their perspectives on the survey topics. In order to design the surveys, researchers took five steps. First, the survey staff conducted a review of the relevant literature, drawing on professional journals, scholarly books, and government reports. Second, a set of research questions were developed for each survey which identified the content areas that should be addressed, provided, and used in order to ensure that the important issues within the content areas were covered. Third, in order to examine if the content areas were clearly addressed and the items fitted to the concepts, the staff carefully examined extant surveys, provided with copies of the NHES: 2001 instruments. Fourth, selected experts were asked to respond regarding areas proposed for deletion, to comment on the relative priorities of specific areas of survey content, and to identify important research issues that were not addressed in previous surveys. Finally, to polish the survey questions, telephone conferences were held with 24 experts (Hagedorn, Montaquila, Carver, O'Donnell, & Chapman, 2006).

The respondent for the ASPA interview was the adult living in the household who was the most knowledgeable about the child's care and education. For the most part, the respondents were the mothers of the children. However, respondents could be the fathers, stepfathers, adoptive parents, foster parents, grandparents, relatives, or nonrelatives. All parents were asked basic demographic questions about the child, the child's health and disability status, parent/guardian characteristics (e.g., race/ethnicity types, parents' educational levels, parents' labor conditions), household income, household characteristics, and also various questions about the parents' choice to send or not send their children to ASPs (Hagedorn et al., 2006).

The total sample of children, 11,684 students, represented a weighted total of 36,185,760 students (respondent rate was 84%). 20% was from the Northeast, 20% from the Midwest, and 20% from the West, with the last 40% coming from the South (Hagedorn et al., 2006). The data contained information about student participation in different types of care arrangements, such as ASPs (community- and school-based care), relative-, neighborhood-, self-, and parental-care. The phone interviewees were the parents or guardians in the household who knew the specifics of their children's care and education. The interview was conducted in either English or Spanish (Carver et al., 2006).

5.2. Sample selections

For this study, the sample was drawn using the following four criteria from the 2005 survey. First, the children should attend formal schools (either public or private) (11,415). Therefore, those who were in homeschooling (269) were excluded. Second, in order to select only "low-income (and the most financially vulnerable) families," defined as families whose income was twice (or 200% of) the federal poverty threshold (U. S. Census Bureau, 2013), it was necessary to apply 200% of the poverty threshold from the U.S. Census of 2004, which considers the annual household income and the number of household members. Since the characteristics of the household income variable in the dataset are categorical, the median value in each category for the annual household income was used. For instance, for code 1, $2500 was used as the median ($5000 or less). For code 2 ($5000–$10,000), $7500 was used as the median. However, the people ($n = 2067$) in code 14 (over $100K) were excluded, because the median for this group could not be calculated, resulting in 1983 participants. Third, out of 1983, 842 of the low-income families have mothers who were employed. Additionally, in order to examine the independent variables in different types of afterschool childcare arrangements, the following cases were excluded: those who did not use any types of after-school childcare arrangements ($n = 49$) and the missing cases ($n = 25$). Finally, the other races ($n = 51$) were dropped due to a small sample size for each group. The sample of 717 participants was used for data analyses.

5.3. Measures

The independent variables are after-school programs (ASPs) (the reference group) ($n = 114$), which include school- and community-based programs. The comparison groups are relative care ($n = 178$), which combines relative care ($n = 147$) and neighborhood-care ($n = 31$)[5]; self-care ($n = 94$); parental care, which includes mother/stepmother/foster mother or father/foster father/stepfather ($n = 266$); and some combination of care types ($n = 65$). The combination-care includes combinations of community-based and relative care ($n = 28$), self- and community-based care ($n = 18$), and self- and relative care ($n = 19$). Based on the socio-ecological model that affects children's developmental outcomes (Riggs & Greenberg, 2004), the following family-level variables were used as covariates: mothers' marital status, including four categories of married (reference group), separated, divorced, never married and mothers' education, including three categories of without high school diplomas (reference group), high school diplomas, and college and above. At the individual level, children's age, gender of boys (reference group) and girls, and three race/ethnicity types, which were White (reference group), African American, and Hispanic/Latino. At the policy level, the selected variable was receiving childcare subsidies: "*Is the state government or welfare agency currently helping you pay for any childcare costs (for any child)*?" (1 = yes, 0 = no). Finally, at the community level, the selected variable was household location (located in a rural or urban area). For this question, respondents only needed to answer by choosing either urban (1) or rural (2) when asked "*Where are you living*?" Finally, the following four variables available from the dataset were used as dependent variables: parents' report of the children's academic score, having problems with schoolwork, behavioral problems, and having experience of suspension, detention, and expulsion. The first two variables, academic scores and schoolwork problems, were used as measures of children's academic development. Behavioral problems and school behavioral problems were used to assess children's behavioral development.

[5] Relative care includes family members such as grandmothers, grandfathers, aunts, uncles, brothers, sisters but not the child's parent or step-parent. Neighborhood-care refers to babysitting by a neighbor including in the context of home childcare (National Center for Education Statistics, 2015c).

The children's academic scores were measured with the question, "*Overall, across all subjects, what grades does your child get from school*?" It was recoded as binary variables with A ($n = 192$) as 1 and B ($n = 214$), C ($n = 104$), D ($n = 26$), and F ($n = 11$) as 0. B to F (B + C + D + F) were combined into the group "B and below" because the number of each case was much smaller. The other academic development was asked to parents about their child's schoolwork behavior. The specific question that respondents were asked was, "*Have any of (CHILD)'s teacher or (his/her) school contacted you about any problems (he/she) is having with schoolwork this year*?" The response was binary, with the options again being either "Yes" (1) or "No" (0).

For behavioral development, the category of behavioral problems was used as a binary variable with the options of "Yes" (1) or "No" (0) to the question "*Have any of (his/her) teachers or (his/her) school contacted by you (or* (Child))*'s (mother/stepmother/foster mother/father/stepfather/foster father/grandmother/grandfather/aunt/uncle/cousin) (or (the) other adults(s) in your household) about any behavior problems (he/she) is having in school this year*?" The other item for behavioral development was having experienced suspension, detention, and expulsion using the question "*Has your child experienced ① out of school suspension*? *② in-school suspension/detention or ③ expelled*?" This question was also treated as a binary with a "Yes" response to any of the three questions indicating serious disciplinary action recorded as 1, and responses of "No" for all three questions recorded as 0.

5.4. Analysis strategy

In order to examine the hypothesis, multivariate logistic regression analyses were employed to evaluate the relationship between the independent variable—attending five different types of after-school childcare arrangements—and dichotomous dependent variables—participants' academic scores, having schoolwork problems, behavioral problems, and having experience of suspension, detention, and expulsion, along with control variables.

6. Results

6.1. Descriptive statistics

Weighted percentages, mean, and standard deviation of key variables are presented in Table 1. Weighted statistics were utilized due to the sampling procedure of the data collection. All of the estimates in the data were based on weighting the observations using the probability of selection of the respondents and other adjustments to partially account for nonresponse and coverage bias (Carver et al., 2006). Survey weights were applied to the sample to account for the cross-sectional design and over-sampling of cases. This method helps to decrease the variation in weights in order to improve the statistical efficiency of weighted estimates (National Longitudinal Surveys, 2014).

As indicated in Table 1, other than parental care (36%)- and self-care (13.2%), 17.1% of children were in ASPs, 7.4% of children were in some combination of care, and 26.2% of children used in relative care. Most of all, grandmothers (41.3%) and other relatives (16.6%), including sibling care, were the primary caregiver in relative care when relative care was alone and also when relative care was used in combination with other care types (29.5% of grandmothers, 24.4% of other relatives). The average age of the children in the study was 9.56 years old. More than half were girls (50.9%). The race component amounted to a high percentage of Hispanic/Latino children (43.1%), a lesser percentage of White children (33.9%) and finally, African American children (23%).

In regards to mothers' marital status, 41.4% were married; 32.5% were widowed, separated, or divorced; and 26.1% were never married. In terms of mothers' educational levels, 31.7% had less than a high school education, 37.7% had high school or equivalent, and 30.6% had some college or higher. Only 16.4% of households received childcare subsidies. Furthermore, a majority of households lived in urban areas (79.1%). In academic outcomes, 34.1% of children received A's and 65.9% of children received B's, C's, D's, or F's. Additionally, 28.6% of children had schoolwork problems. In the behavioral areas, 26.5% of children responded "yes" to the question whether they had showed any behavioral problems at school. Additionally, 9.4% of children responded "yes" to the question whether they had experienced suspension, detention, and expulsion.

Table 1
Percentages, means, and standard deviation of the sample ($N = 717$).

Variables	%	M	SD
Independent variables			
After-school childcare arrangements			
After-school programs (school- and community-based)	17.1		
Relative care	26.2		
Grandmother	41.3		
Grandfather	1.9		
Aunt	12.4		
Uncle	5.1		
Other relatives	16.6		
Self-care	13.2		
Parental care	36		
Combination of care	7.4		
ASPs & relative care	2.9		
Self-care & ASPs	2.3		
Self-care & relative care	2.1		
Socio-demographic characteristics			
Age in years (3–15)		9.56	2.73
Gender			
Male	49.1		
Female	50.9		
Race/ethnicity			
White	33.9		
African American	23		
Hispanic/Latino	43.1		
Mothers' marital status			
Married	41.4		
Widowed/separated/divorced	32.5		
Never-married	26.1		
Mothers' educational levels			
Without high school diplomas	31.7		
High school or equivalent	37.7		
College experience and above	30.6		
Policy level (childcare subsidies)			
Yes	16.4		
No	83.6		
Community Level			
Urban	79.1		
Rural	20.9		
Dependent variables			
Developmental outcomes			
Academic areas			
Scores			
A	34.1		
B and below (B,C, D, or F)	65.9		
Having problems with schoolwork			
Yes	28.6		
No	71.4		
Behavioral areas			
Behavioral problems at school			
Yes	26.5		
No	73.5		
Having experience of suspension, detention, expulsion			
Yes	9.4		
No	90.6		

6.2. Academic outcomes

The two variables, academic scores and having schoolwork problems were assessed for children's academic areas. Since these two variables were assessed with other covariates controlled, multivariate logistic regressions were utilized.

Table 2
Logistic regression estimates on academic scores.

Variables	Model		
	B(*SE*)	Exp(*B*) OR	95% CI
After-school childcare arrangements (ASPs)			
Relative care	0.087(0.27)	1.09	[0.65, 1.84]
Self-care	0.18(0.33)	1.19	[0.63, 2.26]
Parental care	0.37(0.25)	1.44	[0.89, 2.34]
Combination of care	0.16(0.35)	1.17	[0.59, 2.33]
Race/ethnicity (white)			
African American	−0.01(0.24)	0.99	[0.62, 1.57]
Hispanic/Latino	0.26(0.21)	1.29	[0.86, 1.95]
Mothers' educational levels (without high school diplomas)			
High school diplomas	0.01(0.21)	1.01	[0.68, 1.51]
College and above	0.54*(0.22)	1.72	[1.13, 2.63]
Mothers' marital status (married)			
Separated/divorced/widowed	−0.13(0.20)	0.88	[0.59, 1.30]
Never married	0.10(0.22)	1.10	[0.72, 1.69]
Sex (boys)			
Girls	0.29†(0.16)	1.34	[0.97, 1.85]
Age			
	−0.13***(0.03)	0.88	[0.83, 0.93]
Childcare subsidies (yes)			
No	0.16(0.26)	1.17	[0.71, 1.95]
Community level (urban)			
Rural	0.01(0.24)	1.01	[0.63, 1.61]
−2 LL		877.34	
df		14	

Reference categories are in parentheses.
SE = standard error, OR = odds ratios.
† $p < 0.10$.
* $p < 0.05$.
*** $p < 0.001$.

Table 3
Logistic regression estimates on having problems with schoolwork.

Variable	Model		
	B(*SE*)	Exp(*B*) *ORR*	95% CI
After-school childcare arrangements (ASPs)			
Relative care	−0.50†(0.26)	0.61	[0.36, 1.04]
Self-care	−0.37(0.32)	0.69	[0.37, 1.29]
Parental care	−0.68**(0.26)	0.51	[0.31, 0.85]
Combination of care	0.40(0.33)	1.48	[0.77, 2.85]
Race/ethnicity (white)			
African American	−0.34(0.25)	0.71	[0.44, 1.15]
Hispanic/Latino	−0.57*(0.22)	0.57	[0.37, 0.88]
Mothers' educational levels (without high school diplomas)			
High school diplomas	−0.08(0.21)	0.93	[0.61, 1.40]
College and above	−0.28(0.24)	0.23	[0.48, 1.20]
Mothers' marital status (married)			
Separated/divorced/widowed	0.36†(0.21)	1.44	[0.96, 2.16]
Never married	0.057(0.24)	0.82	[0.66, 1.69]
Sex (boys)			
Girls	−0.63***(0.18)	0.53	[0.37, 0.75]
Age			
	0.08*(0.04)	1.09	[1.02, 1.17]
Childcare subsidies (yes)			
No	−0.17(0.26)	0.51	[0.51, 1.41]
Community level (urban)			
Rural	−0.14(0.25)	0.87	[0.53, 1.43]
−2 LL		803.55	
df		14	

Reference categories are in parentheses.
SE = standard error, OR = odds ratios.
† $p < 0.10$.
* $p < 0.05$.
** $p < 0.01$.
*** $p < 0.001$.

6.2.1. Academic scores

This model contained seven covariates (age, sex, race, mothers' educational levels, marital status, childcare subsidies, and community levels). As shown in Table 2, two of the covariates made a unique statistically significant contribution to the model. First, there was a significant association between mothers' academic levels and children's academic scores. Specifically, the positive b value (0.54) indicated that, compared to children whose mothers were without a high school degree (reference group), children whose mothers had a college degree or above were more likely to receive "A". In addition, according to the odds ratio (OR), children whose mothers with college and above showed about 2 times more likelihood of receiving "A" scores than children whose mothers were without high school diplomas (b = 0.54, OR = 1.72, $p = 0.01$). Second, the positive b value (0.29) of sex indicated that girls were more likely to receive 'A" than boys (reference group). Also, the odds ratio of a girl receiving score "A" was 1.3 times higher than for a boy receiving score "A" (OR = 1.34, 95% CI [1.13, 2.63], $p = 0.07$). These outcomes suggested that girls were more likely to receive "As" than boys; however, the estimate was only marginally significant. The negative b value (−0.13) of age indicated that an increase in age resulted in a decreased probability of receiving "A" scores. Also, one-year increase in age was associated with 11% decrease in the odds of receiving the score A (OR = 0.89, 95% CI [0.83, 0.93], $p = 0.00$). That is, older children were likely to receive a lower grade (B or below) than younger children. Lastly, none of childcare arrangements were positively or negatively associated with academic scores.

6.2.2. Having problems with schoolwork

Table 3 indicated that there was a significant association between after-school childcare arrangements and children's problems with schoolwork. First, the negative b value (−0.50) of relative care indicated that children in relative care were less likely to have schoolwork problems than children in ASPs (reference group). In addition, the odds ratio indicated that a child reporting schoolwork problems in relative care was 39% lower than a child in ASPs reporting schoolwork problems (OR = 0.61, 95% CI [0.36, 1.04], $p = 0.070$). Second, the negative b value (−0.68) of parental care suggested that children in parental care were less likely to display schoolwork problems than children in ASPs. At the same time, the odds ratio indicated that participants having schoolwork problems in parental care were 49% lower than children in ASPs (OR = 0.51, 95% CI [0.31, 0.85], $p = 0.009$). Third, there was an association between race/ethnicity and children's schoolwork problems. The negative b value (−0.57) of the Hispanic/Latino group indicated that Hispanic/Latino children were less likely to have schoolwork problems than White children (reference group). In addition, the odds ratio indicated that Hispanic/Latino children having schoolwork problems were 43% lower than White children having schoolwork problems (OR = 0.57, 95% CI [0.37, 0.88], $p = 0.010$). Fourth, the positive b value (0.36) of separated/divorced/widowed mothers indicated that, compared to children with married mothers (reference group), children with separated/divorced/widowed mothers were more likely to have schoolwork problems. In addition, the odds ratio indicated that children of separated/divorced/widowed mothers having schoolwork problems were 1.4 time higher than children of married mothers (OR = 1.44, 95% CI [0.96, 2.16], $p = 0.078$); however, the estimate was marginally significant. Fifth, the negative b value of sex (−0.63) indicated that girls were less likely to have schoolwork problems than boys (reference group). Also, the odds ratio indicated that girls reporting schoolwork problems was 47% lower than for boys who reported schoolwork problems (OR = 0.53, 95% CI [0.37, 0.75], $p = 0.000$). Finally, the positive b value (0.08) of age indicated that an increase in the variable score resulted in an increased probability of having schoolwork problems.

Also, one-year increase in age was associated with one time increase in the odds of having schoolwork problems (OR = 1.09, 95% CI [1.02, 1.17], $p = 0.016$). These two outcomes indicated that older children were more likely to have schoolwork problems than younger ones.

6.3. Behavioral outcomes

The two variables, behavioral problems and having experienced suspension, detention, and expulsion were assessed for children's behavioral areas. Since these two variables were accessed with other covariates, multivariate logistic regressions were utilized.

6.3.1. Behavioral problems

For the behavioral problems variable, the logistic model contained additionally 7 covariates (sex, age, race/ethnicity, mothers' educational levels, mothers' marital status, childcare subsidy, and community levels). According to Table 4, first, the negative b value (−0.57) of parental care indicated that children in parental care were less likely to have behavioral problems than children in ASPs (reference group). In addition, the odds ratio of relative care having behavioral problems was 43% lower than ASPs who reported having behavioral problems (OR = 0.57, 95% CI [0.33, 0.97], $p = 0.039$). Second, race/ethnicity showed a significant relationship with a dependent variable. For instance, the positive b value (0.58) of African American children indicated that, compared to White children (reference group), African American children were more likely to have behavioral problems. Also, the odds ratio of a Hispanic/Latino child having behavioral problems was 1.79 times higher than for a White child having behavioral problems (OR = 1.79, 95% CI [1.09, 2.96], $p = 0.022$). Third, the negative b value (−0.96) of sex indicated that girls were less likely to have behavioral problems than boys (reference group). Also, the odds ratio of a girl having behavioral problems was 62% lower than a boy who reported having behavioral problems (OR = 0.38, 95% CI [0.26, 0.56], $p = 0.000$). These outcomes explained that girls were 62% less likely to have behavioral problems than boys. Fourth, the positive b value (0.07) of age indicated that an increase in the variable score resulted in an increased probability of having behavioral problems. Also, one-year increase in age was associated with one time increase in the odds of having behavioral problems (OR = 1.07, 95% CI [0.10, 1.15], $p = 0.069$). In other words, older children were more likely to show behavioral problems than younger children. However, the estimate was only marginally significant. Fifth, the negative b value (−0.47) of the independent variable of receiving childcare subsidies indicated that children not receiving childcare subsidies were less likely to have behavioral problems than children receiving childcare subsidies. Also, the odds ratio of a child not receiving childcare subsidies having behavioral problems was 37% lower than a child receiving childcare subsidies (OR = 0.63, 95% CI [0.37, 1.06], $p = 0.079$). However, once again, the estimate was only marginally significant.

6.3.2. Having experience of suspension, detention, and expulsion

The variable, school behavioral problems (experiencing in and out of school suspension, expulsion) was analyzed holding seven constants (ages, gender, race/ethnicity, mothers' marital status, educational levels, childcare subsidies, and community levels). According to Table 5, first, race/ethnicity showed a significant association with the dependent variable. Specifically, the positive b value (1.01) of the independent variable, African American children, indicated that, compared to White children (reference group), African American children were more likely to have experience of suspension, detention, and expulsion. In addition, the odds ratio of an African American having problems of suspension, detention, and expulsion was 2.7 times higher for a White who reported having these problems (OR = 2.75, 95% CI [1.30, 5.68], $p = 0.006$). Second, mothers' educational levels were significantly associated with

Table 4
Logistic regression estimates on behavioral problems.

Variables	Model		
	B(*SE*)	Exp(*B*) OR	95% CI
After-school childcare arrangements (ASPs)			
Relative care	−0.39(0.30)	0.68	[0.39, 1.20]
Self-care	−0.45(0.34)	0.64	[0.33, 1.26]
Parental care	−0.57*(0.27)	0.57	[0.33, 0.97]
Combination of care	0.054(0.36)	1.06	[0.52, 2.12]
Race/ethnicity (white)			
African American	0.58*(0.26)	1.79	[1.09, 2.96]
Hispanic/Latino	0.032(0.24)	1.03	[1.09, 2.30]
Mothers' educational levels (without high school diplomas)			
High school diplomas	0.07(0.23)	1.07	[0.68, 1.67]
College and above	0.09(0.25)	1.09	[0.67, 1.77]
Mothers' marital status (married)			
Separated/divorced/widowed	0.13(0.23)	1.13	[0.73, 1.77]
Never married	0.32(0.24)	1.36	[0.85, 2.20]
Sex (boys)			
Girls	−0.96***(0.19)	0.38	[0.26, 0.56]
Age	0.07†(0.04)	1.07	[0.10, 1.15]
Childcare subsidies (yes)			
No	−0.47†(0.27)	0.63	[0.37, 1.06]
Community level (urban)			
Rural	−0.16(0.28)	0.85	[0.49, 1.47]
−2 LL		729.53	
df		14	

Reference categories are in parentheses.
SE = standard error, OR = odds ratios.
† $p < 0.10$.
* $p < 0.05$.
*** $p < 0.001$.

Table 5
Logistic regression estimates on having problems of suspension, detention, expulsion.

Variables	Model		
	B(*SE*)	Exp(*B*) OR	95% CI
After-School Childcare Arrangements (ASPs)			
Relative care	−0.37(0.46)	0.69	[0.28, 1.69]
Self-care	−0.44(0.49)	0.65	[0.25, 1.69]
Parental care	−0.46(0.43)	0.63	[0.27, 1.46]
Combination of care	0.14(0.51)	1.14	[0.42, 3.09]
Race/ethnicity (white)			
African American	1.01**(0.37)	2.75	[1.30, 5.68]
Hispanic/Latino	−0.38(0.38)	0.68	[0.32, 1.45]
Mothers' educational levels (without high school diplomas)			
High school diplomas	−0.95**(0.34)	0.39	[0.20, 0.75]
College and above	−1.11**(0.38)	0.33	[0.16, 0.69]
Mothers' marital status (married)			
Separated/divorced/widowed	0.25(0.33)	1.29	[0.67, 2.46]
Never married	0.41(0.36)	1.51	[0.75, 3.03]
Sex (boys)			
Girls	−1.38***(0.32)	0.25	[0.14, 0.47]
Age	0.34***(0.07)	1.40	[1.23, 1.60]
Childcare subsidies (yes)			
No	0.02(0.42)	1.02	[0.44, 2.34]
Community level (urban)			
Rural	0.130(0.40)	1.14	[0.52, 2.49]
−2 LL		384.31	
df		14	

Reference categories are in parentheses.
SE = standard error, OR = odds ratios.
** $p < 0.01$.
*** $p < 0.001$.

school behavioral problems: the negative b value (−0.95) of mothers with high school diplomas indicated that children of mothers having high school diplomas were less likely to have experience of suspension, detention, and expulsion than children of mothers without high school diplomas (reference group). In addition, the odds ratio of a mother with a high school diploma having a child who has experienced suspension, detention, and expulsion was 61% lower than a mother without a high school diploma (OR = 0.39, 95% CI [0.20, 0.75], $p = 0.005$). These outcomes explained that children of mothers with high school diplomas were 61% less likely to have experience of suspension, detention, and expulsion than children of mothers without high school diplomas. Additionally, the negative b value (−1.11) of mothers with college and above indicated that children of mothers with college and above were less likely to have problems of suspension, detention, and expulsion. Also, the odds ratio of a mother with college and above having problems of suspension, detention, expulsion was 67% less likely to report her child's experience of suspension, detention, and expulsion than a mother without high school diploma (OR = 0.33, 95% CI [0.16, 0.69], $p = 0.003$). Third, the negative b value (−1.38) of sex indicated that girls were less likely to have experience of suspension, detention, and expulsion than boys. Also, the odds ratio of a girl having problems of suspension, detention, and expulsion was 75% lower than a boy who reported having these problems (OR = 0.25, 95% CI [0.14, 0.47], $p = 0.000$). Fourth, the positive b value (0.34) of age indicated that an increase in the variable score resulted in an increased probability of having experience of suspension, detention, and expulsion. Also, one-year increase in age was associated with a 1.4 times increase in the odds of having problems of suspension, detention, and expulsion while holding other covariates constant (OR = 1.40, 95% CI [1.23, 1.60], $p = 0.000$). This indicated that older children were more likely to have experience of suspension, detention, and expulsion than younger children.

In summary, the hypothesis that low-income children in ASPs would show better academic and behavioral outcomes than their counterparts in other after-school childcare arrangements, including relative, self-, parental, and some combination of care, was not supported. As for academic outcomes, children's reported academic scores were not impacted by any type of after-school childcare arrangements, after controlling for covariates. Children's schoolwork problems, however, did show variations based on types of childcare. However, as opposed to the hypothesis, fewer schoolwork problems were reported for children in relative and parental care than for children in ASPs. With regard to behavioral problems, once again, children in parental care displayed better outcomes than those who were in ASPs. The childcare arrangement was not related to whether a child was ever suspended, given detention, or expelled. These results failed to support the hypothesis that children in ASPs would display better behavioral outcomes than children in unstructured childcare arrangements.

7. Discussions

The current study is one of the first empirical investigations to examine the relationships between different types of after-school childcare and the academic and behavioral outcomes of low-income children using nationally representative data. Little attention has been paid in existing literature to the comparative outcomes of different types of after-school childcare and only ASPs have been substantially studied.

7.1. Main findings: developmental outcomes of low-income children

Although no relationship was shown between after-school childcare arrangements and low-income children's academic scores, a relationship was found between childcare arrangements and whether children had schoolwork problems or not. Surprisingly, children in unstructured childcare arrangements—relative and parental care—showed better schoolwork performance than children in ASPs. This finding did not support the hypothesis that children would benefit academically from structured ASPs. A number of studies of specific ASPs have demonstrated both high quality instruction and benefits for participations (Birmingham et al., 2005; Brecher et al., 2009; Carter et al., 2006; Lauer et al., 2006; Little et al., 2007; Mahoney & Cairns, 1997; Posner & Vandell, 1994; Reisner et al., 2001; Weiss & Nicholson, 1998), and both learning theory and social cognitive theory suggest that structured ASPs lead to children's cognitive and behavioral development. However, this study outcome showed opposite findings.

This study also showed positive outcomes of children with parental care rather than those from ASPs in terms of indicators of behavioral problems. The study's hypothesis that the structured nature of ASPs would lead to positive behavioral outcomes was not supported. The hypothesis that ASPs would support positive behavioral outcomes was based on research showing that structured ASPs can provide proper interventions and instructions in educational arrangements (Perry, 1996). However, the existing empirical research shows mixed results in comparisons of the impact of ASPs and parental care on children's behavioral outcomes. As mentioned in the literature review, while Vandell and Corasaniti (1988) found that ASPs were more helpful for participants' behavioral areas than parental care, Howie (1996) showed that there were no differences between ASPs and parental care in improving children's behavioral outcomes, all of which were different from this study outcome.

One possible explanation for these findings is the highly variable quality of ASPs. As aforementioned, numerous studies have revealed the effectiveness of ASPs in improving developmental domains of low-income children. However, these studies emphasized the importance of structured, high quality ASPs, including staff qualification (experienced staff, trained instructors), parental and community supports, and supervised and constructive activities, such as sports, technology, and arts (Little et al., 2007; Riggs & Greenberg, 2004), and participation engagement (Mahoney, Lord, & Carryl, 2005). Both Bloom's model of learning theory and Bandura's social contrive theory suggest that these factors are important components of ASPs that could have a positive impact on children. Therefore, our findings support the assumptions from both theories that positive outcomes of children are only anticipated from structured educational settings and appropriate interventions/instructions. As previous findings have indicated, children from low SES households and single parent households are more likely to be involved in lower quality ASPs with less experienced staff (Little et al., 2008), which in turn leads to children's lower academic achievement (Fashola, 1998). This study outcome draws attention to examine whether ASPs in low-income communities are properly structured and whether ASPs are well implemented. The second possible explanation for the positive effectiveness of ASPs found in previous research is that research usually done on ASPs has had a specific purpose and has focused on specific programs designed by specialists rather than examining general ASPs.[6] In other words, this research only shows general ASPs currently implemented, particularly those in economically disadvantaged areas.

The second interesting finding is related to relative care. There have been few recent studies that have attempted to explore the characteristics and impact of relative care on low-income children's outcomes. This finding contradicted the findings from the study of Kontos, Howes, Shinn, and Galinsky (1997) that expected that grandmothers are more likely to let children watch television and not provide learning activities, showing the lack of the caregiver's responsibility for children. Instead, this study's finding that relative care is positively correlated with better outcomes, especially in the area of schoolwork, suggests that relative care can play a positive role in children's academic outcomes. Relatives'

[6] The examples of the specific ASPs are: Evaluations of the school-based TASC programs (2001), Foundations, INC (2002), the national evaluation of the 21st Century Communities Learning Center (CCLC) Programs, and the Study of Promising Afterschool Programs at the University of California, Irvine and the University of Wisconsin-Madison and Policy Studies Associates, Inc.

(grandparents, older siblings, uncles, aunts, and anyone related to children) responsibilities and their bond in cultural and structural family arrangements (Uttal, 1999) would play an essential role in children's behavioral developmental outcomes. In addition, relative care is more likely to be associated with a low caregiver-child ratio (e.g., 1:2, 1:3 or 1:5) and small group size interaction, which may be more likely to yield positive academic outcomes (Schwartz, Schmitt, & Lose, 2012).

7.2. Limitations

There are four primary limitations of data set in the current study. First, this study is not an experimental research, and it is impossible to control all possible covariates (such as school environment, siblings) that can affect the relationship between independent variables and dependent variables; and furthermore, the data is cross-sectional, collecting information at only one time for about three months (from January 3 through April 24, 2005). Therefore, the causal relationships between independent and dependent variables cannot be determined. Second, the household annual income was measured within specific categories, not actual amount of income. Therefore, the selection of low-income is based partly on estimation. Third, there were no variables to assess the quality of childcare arrangements, including the ratio of instructors to students, the list of outdoor and indoor activities, the quality of instructors, and the partnerships with communities and parents. Therefore, it is difficult to investigate how children in different types of care spend their time and how instructors/providers interact with them. Fourth, children's academic and behavioral outcomes were rated by parents (in particular, mothers) with single-item questions (i.e., mono-method bias), and parents might report outcomes more positively (i.e., reactive self-report changes), which can threaten construct validity (Shadish, Cook, & Campbell, 2002). Despite these limitations, this was the one of the first studies to examine the ASPs and other different types of after-school childcare arrangements using a nationally representative data set. The research findings could lead scholars to draw special attention to relative care and other unstructured cares, which has been a peripheral subject of childcare issues in the U.S.

7.3. Implications

7.3.1. Practice implications

The study findings showed that the older the children, the lower their academic scores and the more behavioral problems they had. A lack of variety and inappropriate activities in the ASPs might cause parents to hesitate to send their children, in particular older children, to those programs. Most preteens in the program feel unsatisfied with the activities presented as they have lost interest in activities that are targeted at younger elementary school children (Christensen et al., 2011). Therefore, public school social workers who are in charge of ASPs and educators should consider the age variation of participants and design age appropriate and interesting activities for children in the specific age group (Christensen et al., 2011). In addition, the study findings indicate that childcare assistance from relatives or neighbors is helpful for children's schoolwork behaviors. These findings indicate that social workers need to help low-income families who receive social support from networks (including relatives, neighborhoods) maintain these assistances as crucial resources for their children's development and safety (Kirst-Ashman, 2010). For the social work practice at the micro-level, it is important to support these relatives or neighbors by providing them with educational materials, instructions on how to educate children and information of child abuse and neglect. Finally, social workers also can help low-income communities, formal childcare arrangements, ASPs, and public agencies with increasing their revenue system through seeking formal (government) and informal (organization, charity activity) funds and budgets to better implement their services and programs for the development of low-income children (Jansson, 2016).

7.3.2. Policy implications

The findings of fewer positive benefits of ASPs may indicate the need to improve the quality of these programs in low-income communities. It is more accessible for social workers, educators, or government inspectors to examine that of ASPs and formal childcare arrangements and provide interventions accordingly. Hence, school social workers and educators specialized in child development should train childcare providers and after-school programs' instructors on a regular basis to update their knowledge and skills of how to supervise and instruct participants (Gilmore-Barnes, 2006).

The study findings suggest that it is necessary to improve the quality of ASPs to meet the educational and behavioral needs for low-income children. The research results indicate that ASPs may have little benefit beyond reducing the chances of engaging in risk-taking and *anti*-social behaviors. In addition, the study findings showed that there were no positive outcomes for working conditions for low-income working mothers using ASPs. The lower-quality of ASPs in low-income communities may help explain this finding. Hence, offering financial assistance to public schools and low-income communities to improve the quality of ASPs is essential to improving children's developmental outcomes. At the same time, increasing the number of high quality ASPs in economically disadvantaged communities is crucial, especially for low-income families who are not able to find imminent relatives in their proximity.

7.3.3. Research implications

While there have been well-developed theories identifying the benefits of structured ASPs on developmental outcomes of disadvantaged children, there is need of theoretical development that could help explain how relative care and other unstructured care impact children's developmental outcomes. A majority of studies of the impact of childcare on child development have focused on ASPs with little attention to other types of arrangements (e.g., relative and parental care), and much of this research has been done in the context of assessing the outcomes of ASPs designed as experimental interventions to address specific social, developmental, or behavioral concerns rather than for the purpose of investigating the impact of choice of childcare arrangement on children's and mothers' outcomes in naturalistic settings. Consequently, there is a paucity of research explaining the characteristics of the other types of childcare settings and their impact on children's developmental domains.

Second, it should be acknowledged that even though the data file NHES: ASPA of 2005 was the most recently usable data set available from the Department of Education for the study of after-school childcare settings, its information was outdated (about a decade ago). Therefore, in order to keep up with the recent trend of ASPs and other types of childcare settings, future researchers and the government need to collect more recent information that reflect the current situations of after-school childcare settings. In order to offset another shortcoming of the data file NHES: ASPA, two methodologies can be employed in future studies (Riggs & Greenberg, 2004). The first one is randomized controlled trial (RCT: Cook & Campbell as cited in Riggs & Greenberg, 2004). This is referred to as the “gold standard” or “evidence-based” method for the programs' evaluation. In order to implement this evaluation model, children need to be randomly selected into two (experimental versus control)[7] groups (Riggs & Greenberg, 2004). By randomly selecting participants, researchers are able to better control for other variables that can influence participants' developmental domains. In order to further investigate different levels or characteristics of the program, this design can also randomly assign children into different programs with different levels of staff training, curriculum, rates of attendances, and so forth (Riggs & Greenberg, 2004). The second rigorous evaluation model is quasi-experimental designs. This

[7] An experimental group includes children in ASPs; a control group includes children who are not enrolled in ASPs.

technique can be employed when random assignment is not possible. There are many circumstances in which researchers are not able to determine which participants are assigned to ASPs. For these situations, this design is useful, considering the voluntary nature of ASPs and the practical issues of the research design through making two groups—experimental and comparison groups[8] as equivalent as possible (Riggs & Greenberg, 2004; Rubin & Babbie, 2013). Third, since the lack of current information assessing the content or quality of childcare after school hour is another limitation of the study, future researchers should consider to collect such information.

Fourth, in order to increase construct validity, future study should obtain responses from different observer ratings to assess child development outcomes, instead of relying on sole resource (e.g., parents) (Shadish et al., 2002). Finally, future research should further examine the relationship between childcare arrangements and child development outcomes by different age groups (e.g., distinguish lower and higher grades).

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[8] The comparison group is used instead of control group because participants since the comparison group are not assigned randomly (Rubin & Babbie, 2013).

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