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WHAT DID YOU DO DURING THE SUMMER BREAK? RACIAL-ETHNIC DIFFERENCES IN EARLY ELEMENTARY SCHOOL CHILDREN'S SUMMER ACTIVITIES*

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ABSTRACT

Although research has suggested that racial-ethnic achievement gaps among US children may increase during the summer, little is known about racial-ethnic differences in what children do over the summer. We examine racial-ethnic differences in children's engagement in activities presumed to shape their cognitive development during two summers before and after first grade. Analyses using data from the Early Childhood Longitudinal Study-Kindergarten Cohort 2010-11 (N = 4,147) show that controlling for background characteristics, including parents' education and English fluency, compared with White children, Black children read as often, study with parents more, use computers more, and attend summer camps more, whereas they watch TV more, play video games more, play outside less, and take fewer enriching trips. For Hispanic children, many differences from White children at the descriptive level are explained by parents' English fluency. After controlling for these characteristics, Hispanic children use computer more, watch TV and play video games more, and play outside less than White children. Asian children use computers and play video games more, and play outside less. Moderate outside play and computer use, as well as frequent reading on one's own and studying with adults, appear to be related to summer learning gains.

U.S. elementary school children's reading and math skills vary markedly by race-ethnicity. On average, at 4th grade, Asian children do better than children of other racial-ethnic groups, whereas Hispanic and Black children do worse than White children (Musu-Gillette et al., 2017). Why Asian children outperform White counterparts, and why Blacks and Hispanics lag behind, have been of great interest to researchers and policy makers (e.g., Brooks-Gunn and Markman, 2005; Hsin & Xie, 2014). Because academic achievement is strongly related to labor market outcomes, researchers have sought to identify factors that contribute to racial-ethnic gaps in academic achievement (e.g., Brooks-Gunn and Markman, 2005; Waldfogel, 2012). Although researchers tend to agree that parents' socioeconomic status (SES) differences across racial-ethnic groups play a major role in shaping racial-ethnic differences in children's academic performance, empirical studies have shown that SES differences account for only part of racial-ethnic gaps in academic performance (Duncan and Magnuson, 2005). Variation in parenting is another key factor that has been considered to contribute to racial-ethnic differences in children's academic achievement (Brooks-Gunn & Markman, 2005; Hsin & Xie, 2014).

One way to understand how parenting shapes the racial-ethnic achievement gaps may be to investigate variation by race-ethnicity in the extent to which children engage in certain out-of-school activities (Waldfogel, 2012). How young elementary school children spend their out-of-school time is largely determined by their parents and family circumstances (Lareau, 2003). Past research has shown that certain out-of-school activities in which children participate, such as reading more, participating in organized extracurricular activities, and watching TV less, contribute to their reading and math skills (Hofferth, 2010; Hofferth and Sandberg, 2001; McHale, Crouter, and Tucker, 2001). A handful of influential studies, which examined children aged 3 to 11, have shown that how children spend their free time varies considerably by social

groups such as SES (Bianchi and Robinson, 1997; Hofferth and Sandberg, 2001; Lareau, 2003). A couple of studies have shown variation by race-ethnicity (Hofferth, 2010; Hofferth and Sandberg, 2001). More research that focuses on racial-ethnic differences in children's engagement in activities that are related to learning is warranted.

Although the past studies mentioned above examined children's free-time activities around the year, we are particularly interested in examining racial-ethnic variation in children's activities during the summer break. Variation in children's engagement in out-of-school activities may be more pronounced during the summer break than during the school year (Waldfogel, 2012). Earlier studies suggested that achievement gaps tend to widen during summer breaks when children are not in school (Cheadle, 2008; Cooper et al., 1996; Entwisle and Alexander, 1992; Downey et al., 2004); and summer learning gaps during early elementary school years remain until high school (Alexander, Entwisle, and Olson, 2007). Findings of more recent research, using data from the 1998-1999 Early Childhood Longitudinal Study, Kindergarten Cohort (ECLS-K 1998), are less conclusive, showing increases in learning gaps during the summer only between Asian and White children (Burkam et al., 2004; Cheadle, 2008; Downey et al., 2004). In any case, finding out how much variation exits across racial-ethnic groups in the extent of children's engagement in certain learning and leisure activities during summer breaks may provide insight into understanding contexts of the racial-ethnic achievement gap.

Using data from the Early Childhood Longitudinal Study-Kindergarten Class of 2010-11 (ECLS-K 2011) (N = 4,147), we first provide a national picture of early elementary school children's engagement in certain activities during summer breaks and how it varies by race-ethnicity. We focus on the first two summers of elementary school, one after kindergarten and

the other after first grade, because academic skills around first grade have important implications for later academic achievement at age 22 (Entwisle, Alexander, and Olson, 2005). We examine eight activities that prior research has suggested to be related to children's developmental activities, including reading, studying with adults, computer use, watching TV, playing video games, outside play, attending summer camps, and enrichment trips (e.g., Hofferth and Sandberg, 2001). Second, we examine racial-ethnic variations in children's engagement in the seven activities, controlling for family characteristics, such as parents' levels of education, English fluency, marital status, the number of children in the household, and maternal employment status, which are related to engagement in those activities (Hofferth and Sandberg, 2001). Third, to provide some insight into understanding implications of variation in children's activities during the summer, we examine how the extent of children's engagement in the eight activities is linked to gains in reading and math scores between the spring before the summer and the fall after the summer.

Building on prior research on children's free time activities, their associations with children's achievement, and racial-ethnic differences in parenting, this paper will contribute to the literature on achievement gaps by race-ethnicity as well as the scholarship of variations in parenting by race-ethnicity.

BACKGROUND

Children's Engagement in Activities and Achievement

Daily activities in which children engage outside of school have important implications for children's development (McHale, Crouter, and Tucker, 2001). Some activities provide children with opportunities for learning literacy and numeracy skills, whereas other activities may reduce such opportunities (Hofferth and Sandberg, 2001; Larson and Verma, 1999). In this

paper, we focus on seven specific activities in two key areas, including learning activities (reading, computer use, and studying with adults) and leisure activities (TV watching, playing video games, outside play, summer camps, and enrichment trips).

Learning activities. Reading is an activity that has been widely shown to be related to better literacy and math scores (Hofferth and Sandberg, 2001) and better grades (McHale, Crouter, and Tucker, 2001). As elementary schools have increasingly required teachers to incorporate computer use into the curriculum (U.S. Department of Education, 2016), computer use for educational purposes at home may have become important for the development of children's learning skills. A limited number of studies have examined the association between children's computer use at home and their test scores. Using a sample of children aged 3 to 12 from the 1997 PSID-CDS, Attewell, Suazo-Garcia, Battle (2003) found that time spent on the computer at home was not related to reading or math skills. Using the longitudinal data of children aged 6 to 12 in the 1997 PSID-CDS who were interviewed again in 2003, Hofferth (2010) found that for girls only, computer hours were related to *better* reading scores. Burkam and colleagues (2004) found that educational computer use during the summer after kindergarten was related to greater math score gains. We need more research that examines the role of computer use for children's learning especially during the summer break when children have more free-time and thus there may be more variation as to the extent to which children use computers for educational purposes. Finally, although it is considered beneficial for children's learning, empirical research tends to show that adults' helping their children on school work is negatively related to children's test scores (Domina, 2005). This may be in part because of the issue of selection—Parents may be more likely to help children with schoolwork when the children are struggling than when the children are doing well.

Free-time activities. Screen-time, including watching TV, DVD, or videos, has been considered detrimental for children's academic achievement in part because it takes away time for more productive activities such as reading and schoolwork and creative play such as drawing, playing a musical instrument, playing pretend, and playing with toys (Attewell, Suazo-Garcia, Battle, 2003; Vandewater, Bickham, and Lee, 2006). Earlier studies tend to show that watching lots of TV was related to lower cognitive test scores (Timmer, Eccles, and O'Brien, 1985). More recent time-diary studies, however, have shown that time spent on watching TV was not related to language arts score, math scores (Hofferth, 2010; Hofferth and Sandberg, 2001) or grades (McHale, Crouter, and Tucker, 2001).

As video games have become more popular among children as well as teens, scholars have examined how playing video games may influence children's developmental outcomes. Most studies focused on teens and behavioral adjustments (e.g., Anderson and Bushman, 2001). For cognitive outcomes, using the longitudinal data of children aged 6 to 12 in the 1997 PSID-CDS and interviewed again in 2003, Hofferth (2010) found that for girls only, hours spent on playing video games were related to lower language arts scores. Little research has examined the effects of playing video games on early elementary school children's academic performance.

Out-door play has recently restored childbearing experts' recognition as beneficial for children's development in part as a backlash against the tendency of today's parents to sign their children into too many organized extracurricular activities and in part as a way to prevent children from too much screen time (Ginsburg, 2007). Little research has examined the link between outside play and children's test scores. A few studies have shown that time spent on outdoor play is related to lower grades (McHale, Crouter, and Tucker, 2001), although time spent on sports is related to better math scores (Hofferth and Sandberg, 2001).

During a summer break, children may take trips with their parents, such as visiting a zoo, going to art or science museums, going on a vacation at the beach, or going hiking in parks. Researchers and educators have argued that visiting zoos and science museums is positively related to children's learning (Rennie and McClafferty, 1995). These enrichment trips may expose children to various experiences and enhance their curiosity as well as learning. Supporting this idea, Burkam et al. (2004) found that taking enrichment trips during the summer break after kindergarten was related to greater math score gains.

Children's Engagement in Activities: Variation by race-ethnicity

Parents play a key role in influencing how early elementary school children spend their outside-of-school time and what activities they engage in (Bianchi and Robinson, 1997; Lareau, 2003). Parents' socioeconomic status (SES) determines whether parents can provide children with reading materials, a computer, and other learning-related materials and activities, or they can take their children to enriching trips to zoos, museums, hiking, the beaches, or large cities. How parents spend their own leisure time (e.g., doing sports vs. watching TV) may also influence children's activities. For example, studies have shown that parents' own screen time — watching TV or using a computer—is a strong predictor of children's screen time (Lauricella, Wartella, and Rideout, 2015). Parenting values or parenting styles also determine children's engagement in activities. How much first grade children read on their own may depend on parents' beliefs in the importance of reading at home and how much parents read to their children when their children were younger (Waldfogel, 2012). Parents who believe that screen time has negative effects on children's development are more likely to restrict their children from activities such as watching TV and playing video games (Lauricella, Wartella, and Rideout, 2015).

Because parents' resources, leisure time activities, and parenting styles vary by race-ethnicity, as we will discuss below, children's engagement in learning-enhancing activities during summer breaks may differ across racial-ethnic groups:

Racial-ethnic disparities in SES are widely documented. Asian parents are more likely than other parents to have a college or an advanced degree, a professional job, and a higher level of family income (U.S. Bureau of Labor Statistics, 2015). Black and Hispanic parents are less likely than Asian and White parents to have a college degree or a professional job (U.S. Bureau of Labor Statistics, 2015). Past research has shown differences in children's time use by parents' SES. Children with highly educated mothers or fathers were more likely to spend time reading (Burkam et al., 2004; Hofferth and Sandberg 2001), using a computer at home for educational purposes (Burkam et al., 2004), and taking enrichment trips during a summer break (Burkam et al., 2004). Children with highly educated parents were also less likely to watch TV (Bianchi and Robinson, 1997; Burkam et al., 2004; Hofferth and Sandberg, 2001) and study with parents during a summer break (Burkam et al., 2004). Thus, we expect that Asian children are more likely than White children as well as Black and Hispanic children to be engaged in reading, educational computer use, and enrichment trips and are less likely to spend long hours watching TV or playing video games, or get adult help on school work. We also expect that Black and Hispanic children are less likely than White or Asian children to be engaged in reading, educational computer use, or enrichment trips and more likely to get adult help from adults on school work and spend time watching TV and playing video games. These racial-ethnic differences will disappear or be reduced once SES is held constant across the racial-ethnic groups.

Past research has suggested that parenting values and styles differ across racial-ethnic groups (Cheadle and Amato, 2011; Nomaguchi and House, 2013). Asian parents are more likely than parents of other racial-ethnic groups to emphasize the importance of acquiring academic skills for their children and have higher academic expectations for their children (Gibbs et al., 2017; Goyette and Xie, 1999; Hsin and Xie, 2014). In contrast, Hispanic parents, a majority of whom are Mexican immigrant parents, appear to be more laid-back about their children's academic success as they are less likely than parents of other racial-ethnic groups to enroll their children in preschool (Brandon, 2004). For Black parents, Brooks-Gunn and Markman (2005) reported that among families with preschool children, Black parents were less likely to read to their children daily and had fewer reading materials in their homes than White parents.

Only a handful of studies used a national sample to examine racial-ethnic differences in children's free time activities. Hofferth and Sandberg (2001) reported that Black children spent more time studying, but less time reading than White children. Black children spent more time watching TV and less time playing or participating in sports than White children. Hofferth (2010) also found that Black children spent more time watching TV, but spent less time using a computer at home than White children. For Hispanic children, Hofferth and Sandberg (2001) found that compared with White children, Hispanic children spent more time studying, but less time reading, playing or doing sports. For Asian children, Hofferth and Sandberg (2001) found that, compared to White children, Asian children spent more time reading, studying, and watching TV, but less time playing or participating in sports.

THE PRESENT STUDY

In this paper, we provide a national picture of racial-ethnic variations in children's engagement in eight learning-related or free-time activities during the first and second summer

breaks in elementary school. These activities are considered to be related to children's reading and math skills—reading on their own, studying with adults, using computer for educational purposes, playing outside, watching TV, playing video games, attending summer camps, and taking various enrichment trips. We control the analyses for parents' SES and other background characteristics, such as parents' English fluency, children's gender, parents' age, parents' employment status, parents' marital status, because prior research has shown that these characteristics are related to children's free time use (Bianchi and Robinson, 1997; Hofferth, 2010; Hofferth and Sandberg, 2001). We also control the analysis for indicators of school initiations of summer learning activities, such as attendance of summer school programs and provision of book lists, because these school initiations may encourage or discourage parents from having their children participate in certain activities (Waldfogel, 2012). Also, schools tend to require children to attend summer school programs only when children do not meet proficiency levels of reading or math skills (U.S. Department of Education, 2002). Finally, we examine how the extent of engagement in these activities was related to reading and math skill gains.

METHOD

Data

Data for the present analysis were drawn from the ECLS-K 2011. The ECLS-K is a longitudinal study of children who attended full-day or part-day kindergarten in 2010-11 (Tourangeau et al. 2017). The survey includes interviews with mothers or "primary" parents, teachers, and school administrators, as well as one-on-one assessments of children. For the present analysis, we used information about children's summer activities from the fall first-grade and fall second-grade parent interviews, mothers' marital status, employment status, and

children's test scores in the spring first-grade and the spring second-grade interviews, and mothers' demographic characteristics (e.g., age, race-ethnicity, and education) from the fall-kindergarten (base) interview. Our sample includes children whose mothers or primary parents participated in both of the parent interviews in the fall of first grade and in the fall of second grade (N = 4,147). We used the weight variable provided by the ECLS-K 2011 that adjusts the sample regarding non-response to parent interviews, attrition in the follow-up interviews, and other characteristics to be a nationally representative sample of children who attended school from kindergarten through the second grade in 2010-2013.

Dependent and Independent Measures

Reading and math skill gains. The ECLS-K 2011 provides IRT-scaled, standardized test of literacy, mathematics, and science achievements respectively. We focus on literacy and mathematics. Not all schools include science in their classroom curriculum at the kindergarten or first grade levels. We measured reading and math score gains for the first summer (after kindergarten) and the second summer (after first grade) in elementary school. Following Burkam et al. (2004), we created measures of differences in score gains between spring kindergarten scores and fall first-grade scores for the first summer and between spring first-grade scores and fall second-grade scores for the second summer in standard deviation (SD) units to take into account the degree of difference (e.g., the first summer math gain score = [fall first-grade score – spring kindergarten score]/the SD of the fall first-grade score).

Summer activities included eight activities that are considered to be related to children's reading and math skills. The same set of activities were measured in the first and second summers. In fall first-grade and fall second-grade surveys, the primary parents were asked about specific activities in which the focal children had participated during the previous summer.

Reading was based on the question, “During a typical summer week, how often did the child look at or read books on his/her own?” (1 = never, 2 = once or twice, 3 = 3 to 6 times, 4 = every day). *Computer use* was measured by the question, “On a typical summer week, how often did the child use a computer or other electronic device for educational purposes?” (1 = never, 2 = once or twice, 3 = 3 to 6 times, 4 = every day). By electronic device, we mean any type of computer, cell phone, smart phone, iPod, reading device (such as Kindle or Nook), or game system (including those such as Wii, XBox, DS, iTouch, and Playstation). *Study with parents* was the average of three questions, “On a typical summer week, how often did you or any other family member do math activities with the child such as learning numbers, adding, subtracting, or measuring?”, “On a typical summer week, how often did you or any other family member do writing activities with him/her?”, and “On a typical summer week, how often did you or any other family member read books to her?” (1 = never, 2 = once or twice, 3 = 3 to 6 times, 4 = every day). *Outdoor play* was measured by the question, “On a typical summer week, how often did the child play outside actively (for example, running, jumping, or swinging) (1 = never, 2 = once or twice, 3 = 3 to 6 times, 4 = every day). *Playing video games* was measured as minutes per day based on the question, “On a typical summer day, how much time did the child spend playing video games?” which included games played on systems like Playstation, Wii, or Xbox, or on handheld devices such as a Nintendo DS, Sony PSP, iPod, iPad, or cellphone, or games played on the computer. *TV watching* was also measured as minutes per day based on the question, “On a typical summer day, how many hours of television, videotapes, or DVDs on average did the child watch?” This included television shows, videos, or DVDs watched on a TV, computer, or handheld device like an iPad or cellphone; but not games played on gaming systems like Playstation, Wii, Xbox or handheld devices. *Summer camps* was measured as the

total hours children spent attending day or overnight camps during the summer, ranging from 0 to 450. *Enrichment trips* was measured as a continuous variable indicating the number of places the focal children went with their family during the summer out of the following six kinds: (a) an art gallery, museum, or historical site, (b) zoos or aquariums, (c) amusement parks, (d) beaches, lakes, rivers, or state or national parks, (e) plays or concerts, and (f) a large city other than where the child lives (range from 0 to 6).

Race-ethnicity was measured in the base-line interview as five dummy variables indicating the primary parent's race-ethnicity, including non-Hispanic White (reference), non-Hispanic Black, Hispanic, Asian, and other race (pacific islander, American Indian, other race, more than one race).

Control measures

We included seven background characteristics as control variables. Four characteristics were time-invariant. *The primary parent's level of education* was measured in the base-line interview (fall kindergarten) as five dummy variables, including less than high school, high school diploma (reference), some college, college degree, and advanced degree. *Child's gender* was measured by a dichotomous variable (1 = girls, 0 = boys) in the base-line survey (i.e., fall kindergarten). *The primary parent's age* was measured in the base-line survey. *Parents' English fluency* was the mean of eight items regarding how well each parent speak, read, understand, and write English (1 = not well at all, 2 = not very well, 3 = pretty well, 4 = very well, and 5 = English is the primary language). In addition, we included three time-varying control variables. *The number of children* under age 18 in the household was measured in the spring of kindergarten for the first summer and in the spring of first grade for the second summer. *The primary parent's marital status* was measured as three dummy variables including married

(reference), cohabiting, and single, and measured in the spring of kindergarten for the first summer and in the spring of first grade for the second summer. *The primary parent's employment status* was measured as three dummy variables including non-employed (reference), employed part-time, and employed full-time, and measured in the spring of kindergarten for the first summer and in the spring of first grade for the second summer.

We controlled the analyses for two indicators of school-initiated children's summer learning activities. *Book list* was a dichotomous variable whether the child's school provided a book list with particular books to read over the summer. *Summer school program* was measured as three dummy variables, including no summer school program (reference), attended a summer school required by school, and attended a summer school on the parent's decision. We also controlled for school type where children who attended private school were assigned 1 and other children were assigned 0.

Analytical plan

We used multilevel regression models to examine variations by race-ethnicity in children's engagement in eight activities during summer breaks, controlling for family characteristics as well as school factors (Singer, 1998). Two waves were pooled which resulted in the sample size of N = 8,294 observations. Missing cases were imputed using the multiple imputation procedure in SAS (Allison, 2001).

RESULTS

Variation in children's summer activities by race-ethnicity: Descriptive results

We began by examining racial-ethnic differences in children's engagement in eight activities during the first two summers in elementary school at the descriptive level (Figures 1 to 3). Differences between White children and Black children, Hispanic children, or Asian children

were examined using multilevel regression models where we included dummy variables of race-ethnicity and time variable only. There were many differences between Black and White children. On average, Black children were more likely than White children to use computers for educational purposes and study with parents. There was little difference in the frequency of reading between Black and White children. Black children were less likely than White children to play outside and go on enrichment trips, but more likely to spend time watching TV or playing video games. Hispanic children also showed many differences from White children. Hispanic children were less likely than White children to read on their own, use computers for educational purposes, and study with parents. Hispanic children were also less likely to play outside or have enrichment trips, but more likely to watch TV and play video games. Hispanic children spent fewer hours attending summer camps. Asian children were more likely than White children to use computers for educational purposes and less likely to play outside. For other activities, there were no significant differences between Asian and White children.

[Figures about here]

Table 1 presents means for children's reading and math scores, background characteristics, and other summer variables for the total sample and by race/ethnicity. Consistent with prior findings, SES and other family characteristics vary markedly across the four racial-ethnic groups. Some differences may be worth noting. Asian mothers were more likely than White parents to have a college or advanced degree, whereas Black or Hispanic mothers were less likely to do so. Asian mothers were older than White mothers, whereas Black or Hispanic mothers were younger. Compared to White mothers, Black and Asian mothers were more likely to be employed full-time, whereas Hispanic mothers were more likely to stay home. School factors also varied by race-ethnicity. Asian children were more likely to attend summer school

by their parents' choice, whereas Black and Hispanic children were more likely to attend summer school only when required by the school. Hispanic children were less likely to attend private school and less likely to be provided a summer booklist by their teachers. Because of these varying background characteristics, which are related to children's engagement in activities, multivariate analyses were necessary to understand racial-ethnic variations in children's engagement in activities better.

[Table 1 about here]

Variation in Children's Summer Activities by Race-ethnicity: Multivariate Results

Table 2 presents results of multilevel regression models for the eight activities. We first look at Black children. Even after controlling for background characteristics, Black children were more likely than White children to use computers or other electronic devices for educational purposes, study with their parents or other adults, spend more time watching TV, and play video games than White children. There were no differences in reading engagement between Black children and White children. Black children were less likely than White children to play outside actively and less likely to be taken for various enrichment trips. When controlling for background characteristics, Black children were more likely than White children to spend time attending summer camps.

For Hispanic children, many of differences in their activities from those among White children disappeared when parents' education and English fluency were controlled for. After controlling for these and other background characteristics, there was no difference in frequency of reading on their own, studying with parents, hours spent in summer camps, taking enrichment trips, and playing outside between Hispanic and White children. Differences in two activities remained significant even after controlling for background characteristics: Hispanic children

spent more time watching TV and play video games White children. After controlling for background characteristics, Hispanic children were more likely, not less likely, than White children to use computers for educational purposes.

For differences in frequency of activities between Asian and White children, even after controlling for background characteristics, Asian children were more likely than White children to use a computer and less likely to play outside. After controlling for background characteristics, Asian children were more likely than White children to spend time playing video games.

[Table 2 about here]

Children's Summer Activities and Gains in Reading and Math Skills

To have some insight into implications of variation in the extent of engagement in these seven activities during the summer, we examined association between engagement in these activities and reading and math score changes before and after the summer. As shown in Table 3, reading on one's own was positively related to reading skill gains. Studying with adults was positively related to reading and math gains. Computer use for educational purposes was negatively related to math score gains, whereas time spent on video games was related to reading score gain. Unlike the popular beliefs, outside play was negatively related to reading and math gains. Enrichment trips, summer camps, and time spent watching TV were not related to reading and math gains.

[Table 3 about here]

DISCUSSION

This paper provides a national portrait of racial-ethnic differences in children's engagement in seven activities during the first and the second summer breaks in elementary

school that are considered to be related to their cognitive development, including three learning activities (reading, using computers for educational purposes, and studying with parents) and five leisure activities (outside play, watching TV, playing video games, attending summer camps, and enrichment trips). Our findings show substantial differences in children's engagement in these activities between Hispanic or Black children and White children at the bivariate level. Asian children also differ from White children in some of the activities.

For Black children, our findings suggest that they are more likely than White children to engage in two of the three learning activities examined in the present analysis. Black children read as often as White children, study with parents more, and use computers for educational purposes more. Prior research by Hofferth and colleagues, examining children aged 3 to 12 in the late 1990s, showed that Black children read less (Hofferth and Sandburg, 2001) and used a computer less (Hofferth 2010). Although earlier studies found that Black parents read less to their preschool children (Brooks-Gunn and Markman, 2005), our findings showed no significant difference. More research is warranted to uncover whether these differences in findings may reflect a cohort change in Black parents' involvement in their children's literacy education. For leisure activities, Black children take fewer enrichment trips, watch TV more, play video games more, and play outside less than White children. Black children's longer screen time than White children was consistent with earlier studies (Hofferth, 2010; Hofferth and Sandburg, 2001). At the descript level, we found that Black children watch three hours or more per day (201 minutes in the first summer and 183 minutes in the second summer), whereas White and Asian children watch TV two hours or less per day (Figure 2). In addition, Black children play video games more than one hour per day, whereas White and Asian children play video games one hour or less (Figure 2).

At the bivariate level, Hispanic children are very different from White children in the level of engagement in learning activities during summer breaks: Hispanic children are less likely than White children to be engaged in all of the three learning activities, including reading on their own, using computer, and studying with adults. For example, on average Hispanic children read once or twice per week, while children of other racial-ethnic groups read 3 to 6 times per week (Figure 1). Yet, all of these differences are no longer significant when parents' English fluency and other background characteristics were controlled for. These patterns of findings are consistent with prior research. Our findings of Hispanic children's lower engagement in reading and outside play are consistent with findings of Hofferth and Sandburg's (2001) study of children aged 3 to 12 in the late 1990s. Prior research that examined racial-ethnic differences in learning-related parenting behavior among parents with preschool children suggested that the delay in starting children's literacy education among Mexican immigrant parents may be in part due to a language barrier (Han, Lee, and Waldfogel, 2012). Consistent with this explanation, after controlling for parents' English fluency, the difference in learning-related activities between Hispanic and White children disappear. We also found that Hispanic children are also different from White children in leisure activities at the bivariate level. Hispanic children take fewer enrichment trips, play outside less, and watch TV more. When background characteristics were controlled for, some of the differences disappeared, but longer TV time remained significant and longer time of playing video games appeared.

Differences between Asian and White children are found only in a few activities we examined. Controlling for SES and other background characteristics, Asian children use computers more, play video games more, and play outside less than White children. Prior research, which focused on preschool children, has shown that compared with White parents,

Asian parents are more likely than White parents to have their children use a computer (Gibbs et al., 2017). These findings could indicate that Asian parents are more likely than White parents to be tolerant with children's screen time except for TV watching.

The longer screen time for Black and Hispanic children than White children has been documented in past studies (Taveras et al., 2009). Taveras and colleagues found that Black and Hispanic children were more likely than White children to have a TV in their bedroom; and that parents reported that it was to keep their children occupied so that they could do something else around the house, to help their children fall asleep, and to free up the other TVs so that other family members could watch what they wanted to watch. Further investigation is needed to understand racial/ethnic differences in children's screen time better.

Of the three learning activities we examined, reading is related to more reading score gains and studying with adults is related to more reading and math scores, whereas computer use is negatively related to math score gains. Contrary to the common concern about the negative influence of playing video games, frequency of playing video games is *positively* related to reading score gains whereas frequency of computer use for educational purposes is *negatively* related to math score gains. Some research has shown that the interactive nature of video game playing actually provides potential for learning through special skills, the ability to read images, practice in logic, and problem solving (Hofferth 2010). As Hofferth (2010) suspected, there may be a selection effect. We focused on kindergarten and first-graders, when a majority of children are not yet playing games. Children who like to sit at a desk and study daily may be more likely to play video games at early ages. In contrast, browsing the internet searching for information may end up merely wasting time that could have used in more productive way.

Also counter to the common belief that outside play is beneficial for children, frequency of playing outside is negatively related to gains in reading and math scores. This finding is consistent with findings by McHale and colleagues (2001) focusing on children aged 10 to 12. The present analyses cannot determine the causal direction of this effect. It is possible that children who do not like school work (or children of parents who emphasize the importance of academic effort less) are more likely to play outside. In a supplemental analysis (Appendix), however, we found that at the bivariate level, frequency of outside play is positively related to other activities that are related to better reading and math scores, such as reading on their own and taking enrichment trips, whereas it is negatively related to activities that are related to declines in reading and math scores such as TV watching. Although further investigation is needed to fully explain the negative association between the frequency of outside play and learning during the summer break, a tentative conclusion is that too much play without study time during the summer break may have negative consequences for children's learning.

The present analysis has limitations. First, as we discussed, the present analyses are unable to determine the causal direction. Second, the ECLS-K 2011 does not have time-diary data. Thus we are unable to know the whole picture of how children spend their summer time and its variation by racial-ethnic group. It would be ideal if we were able to examine how much time children spend studying (e.g., reviewing school materials, drilling math problems, writing journals) or how structured their daily schedule is during the summer break (e.g., wake-up time, bed time and total time studying).

Nevertheless, the ECLS-K 2011 provides a unique opportunity to see how children's engagement in activities varies across racial-ethnic groups. The findings show that there are variations across the four racial-ethnic groups in children's engagement in learning activities,

such as reading, and leisure activities such as screen time, outdoor play, and enrichment trips. Differences in the amount and quality of time children spend during three months of their summer break may have implications for their cognitive development.

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Table 1. Weight Means (Stds) for Variables for the Total Sample and by Race-Ethnicity (N = 4,147).

	Total sample		White		Black		Hispanic		Asian		Other Race	
	100.00%		56.76%		12.91%		23.23%		4.28%		2.83%	
Reading spring	73.53	(18.37)	76.38	(20.88)	69.65	(23.60)***	67.85	(15.08)***	79.46	(13.99)*	71.68	(17.40)**
Reading skill gain	0.39	(0.47)	0.36	(0.56)	0.41	(0.54)*	0.44	(0.38)***	0.49	(0.41)***	0.34	(0.40)
Math spring	56.47	(17.26)	59.97	(19.92)	49.61	(20.57)***	50.83	(13.37)***	61.09	(12.97)	56.00	(16.08)**
Math skill gain	0.44	(0.51)	0.45	(0.60)	0.43	(0.61)	0.42	(0.43)	0.51	(0.39)	0.27	(0.44)***
Controls												
Parents' English fluency	3.91	(0.67)	4.21	(0.20)	4.20	(0.28)	3.08	(0.74)***	3.44	(0.41)***	4.14	(0.24)*
< high school	0.12		0.04		0.05		0.35	***	0.06		0.06	
High school	0.24		0.21		0.31	***	0.30	***	0.09	***	0.17	
Some college	0.34		0.37		0.42	*	0.24	***	0.26	**	0.47	
College	0.20		0.25		0.15	***	0.08	***	0.37	***	0.20	
Advanced	0.10		0.13		0.08	**	0.03	***	0.22	***	0.10	
Girls	0.49		0.48		0.48		0.49		0.50		0.58	
Parent age	34.50	(6.77)	35.34	(7.36)	32.97	(8.21)***	32.56	(5.40)***	37.19	(4.20)***	36.52	(7.92)
Non employed	0.32		0.31		0.17	***	0.44	***	0.27	**	0.39	
Part-time	0.22		0.25		0.18	*	0.19	**	0.18	**	0.22	
Full-time	0.46		0.45		0.65	***	0.38	**	0.55	**	0.39	
Number of kids	2.59	(1.17)	2.50	(1.23)	2.59	(1.49)	2.88	(1.02)***	2.21	(0.71)***	2.48	(1.23)
Married	0.70		0.77		0.35	***	0.66	***	0.96	***	0.73	
Cohabiting	0.03		0.02		0.02		0.05	***	0.00		0.02	
Single	0.28		0.21		0.63	***	0.29	***	0.04	***	0.25	
Weeks w/o parents	0.47	(1.10)	0.48	(1.19)	0.70	(1.65)***	0.37	(0.89)**	0.19	(0.55)***	0.46	(0.82)
Summer booklist	0.34		0.35		0.36		0.30	*	0.52	***	0.25	
No summer school	0.92		0.94		0.92		0.91	*	0.78	***	0.90	
Summ prgm required	0.04		0.03		0.05	***	0.07	***	0.05		0.04	
Summ prgm optional	0.03		0.03		0.03		0.02		0.17	***	0.06	
Private school	0.09		0.11		0.11		0.05	***	0.11		0.05	

Note: Differences from Whites were statistically significant at * $p < .05$; ** $p < .01$; and *** $p < .001$.

Table 2. Multi-Level Regression Coefficients for the Association between Race-Ethnicity and Summer Activities (N = 4,147).

	Reading			Computer			Adult help			Summer camps		
	b	*SE*		*b*	*SE*		*b*	*SE*		*b*	*SE*	
Race/ethnicity												
Black	.084	.057		.373	.066	***	.172	.039	***	15.814	5.529	**
Hispanic	-.029	.047		.141	.055	**[b]	-.005	.032	[c]	-4.439	4.572	[c]
Asian	.081	.061		.371	.071	***[e]	.063	.042		-5.579	6.025	[c]
Other race	.090	.086		.191	.100		.036	.058		-6.075	8.357	
Controls												
Parents' English fluency	.147	.029	***	.239	.034	***	.046	.020	*	1.342	2.848	
< hs	-.056	.056		-.251	.064	***	-.036	.038		5.850	5.449	
Some college	.029	.043		-.003	.050		.013	.029		13.041	4.243	**
College	.078	.047		.002	.055		.004	.032		25.328	4.636	***
Advanced	.188	.055	***	-.054	.064		.071	.037		45.984	5.364	***
Girls	.334	.028	***	.025	.033		.075	.019	***	-1.322	2.765	
Parent age	-.006	.002	**	.001	.003		-.001	.002		.679	.225	**
Cohabiting	.116	.078		.054	.091		.132	.050	**	8.059	6.806	
Single	-.067	.035		-.100	.041	*	.015	.023		3.463	3.193	
# of kids	.002	.012		-.002	.014		-.021	.008	*	-6.806	1.184	***
Employed full	-.081	.031	**	-.005	.037		-.078	.020	***	20.992	2.850	***
Employed part	-.038	.035		-.014	.040		-.054	.022	*	6.712	3.072	*
Book list	.099	.025	***	.011	.031		.087	.016	***	-.076	2.246	
Summ prgm required	-.030	.054		-.013	.062		.024	.033		-8.918	4.618	
Summ prgm optional	.182	.058	**	.103	.067		.083	.036	*	-18.330	4.949	***
Private school	.049	.047		-.002	.054		-.025	.031		13.078	4.405	**
Summer after G1	.027	.019		.058	.022	**	-.089	.011	***	.923	1.448	
Intercept	2.374	.157	***	1.402	.182	***	2.367	.107	***	-7.703	15.339	

* p < .05; ** p < .01; *** p < .001. Differences from black kids are significant at [a] p < .05; [b] p < .01; [c] p < .001. Differences from Hispanic kids are significant at [d] p < .05; [e] p < .01; [f] p < .001.
Omitted reference categories are: White, high school, married, full-time employed, and no summer school attendance. Parents' marital status and employment status were measured in spring before the summer.

Table 2. Cont.

	TV time			Video games			Trips			Outside Play		
	b	*SE*		*b*	*SE*		*b*	*SE*		*b*	*SE*	
Race/ethnicity												
Black	58.612	5.903	***	24.608	4.129	***	-.302	.096	**	-.139	.038	***
Hispanic	30.129	4.794	*** [c]	11.103	3.356	***[b]	.033	.079	[c]	-.047	.032	[a]
Asian	8.313	6.292	[ce]	15.569	4.383	***	.072	.104	[c]	-.311	.043	*** [cf]
Other race	14.271	8.761		3.351	6.123		.083	.144				
Controls										-.003	.058	
Non-English	12.162	2.988	***	6.904	2.098	**	.240	.050	***	.078	.020	***
< hs	1.894	5.719		1.921	3.993		-.353	.095	***	.018	.038	
Some college	-6.709	4.455		-6.299	3.109	*	.347	.074	***	-.016	.029	
College	-24.520	4.870	***	-12.914	3.409	***	.764	.081	***	.000	.032	
Advanced	-40.143	5.630	***	-18.672	3.950	***	.941	.093	***	.032	.037	
Girls	-1.954	2.900		-28.175	2.031	***	.045	.048		-.094	.019	***
Parent age	-.474	.236	*	-.208	.165		.009	.004	*	-.001	.002	
Cohabiting	-7.178	7.949		5.227	5.762		-.022	.128		.044	.054	
Single	-1.394	3.554		-.500	2.512		-.108	.058		.003	.024	
# of kids	-.617	1.274		-1.069	.894		-.058	.021	**	.021	.008	*
Employed full	4.905	3.199		2.908	2.295		.038	.052		-.003	.021	
Employed part	-8.664	3.554	*	-1.455	2.554		.065	.057		.044	.024	
Book list	-6.549	2.617	*	-1.170	1.904		.146	.042	***	.045	.018	*
Summ prgm required	-11.726	5.438	*	-6.032	3.963		-.087	.087		-.047	.037	
Summ prgm optional	-7.236	5.877		-.895	4.268		-.031	.094		-.051	.040	
Private school	-1.806	4.767		-4.963	3.349		.176	.078	*	-.015	.032	
Summer after G1	-.604	1.864		7.226	1.421	***	.059	.029	*	-.017	.013	
Intercept	111.198	16.120	***	48.353	11.242	***	1.975	.265	***	3.441	.108	***

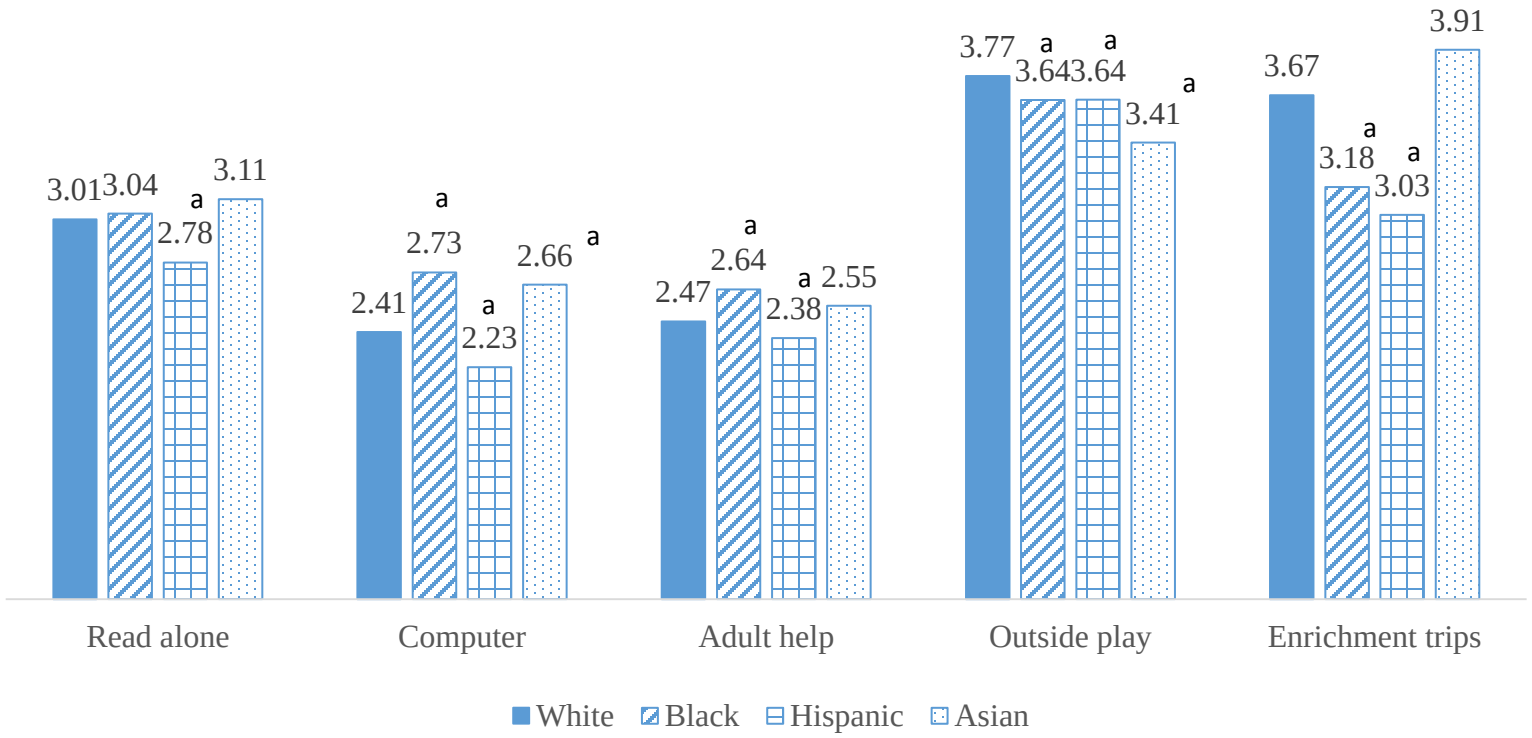
* p < .05; ** p < .01; *** p < .001. Differences from black kids are significant at [a] p < .05; [b] p < .01; [c] p < .001. Differences from Hispanic kids are significant at [d] p < .05; [e] p < .01; [f] p < .001.
Omitted reference categories are: White, high school, married, full-time employed, and no summer school attendance. Parents' marital status and employment status were measured in spring before the summer.

Table 3. Associations Between Summer Activities and Reading and Math Scores in Spring Before Summer and Gains in Reading and Math Scores from Spring to Fall (N = 4,147)

	Reading				Math			
	Spring		Gain		Spring		Gain	
	b	*SE*	*b*	*SE*	*b*	*SE*	*b*	*SE*
Summer activities								
Reading on one's own	1.139	.194***	.031	.009***	.559	.168***	-.001	.010
Computer	.143	.163	-.007	.007	.270	.143	-.020	.008**
Study with adults	-.629	.327	.028	.014*	-.693	.286*	.034	.015*
Summer camps	.003	.002	.000	.000	.004	.002*	.000	.000
Enrichment trips	.163	.117	.003	.005	.130	.102	.004	.005
TV watching	-.001	.002	.000	.000	-.002	.002	.000	.000
Video games	.000	.003	.000	.000*	.001	.002	.000	.000
Outside play	-.517	.271	-.051	.012***	-.459	.238	-.030	.013*
School factors								
Book list	.002	.329	-.007	.014	.003	.286	-.022	.015
Summ prgm required	-5.192	.682***	.045	.031	-3.103	.597***	-.037	.032
Summ prgm optional	-2.106	.731**	.075	.033*	-.231	.636	-.004	.035
Private school	.275	.704	.025	.022	-.022	.623	.034	.024
Weeks w/o parents	-.015	.153	.001	.007	.150	.134	.001	.007
Background characteristics								
Black	-2.428	.967*	.045	.027	-5.914	.884***	.021	.029
Hispanic	-.663	.794	.014	.021	-1.759	.731*	-.017	.023
Asian	4.564	1.044***	.014	.029	1.584	.958	.040	.030
Other race	-3.694	1.446*	.002	.039	-2.984	1.331*	-.113	.042**
< high school	-2.109	.946*	.023	.026	-1.645	.868	-.008	.027
Some college	2.229	.737**	-.011	.020	2.038	.675**	-.021	.021
College	6.245	.810***	.020	.022	5.906	.741***	.040	.024
Advanced	8.172	.942***	-.005	.026	8.324	.861***	.033	.028
Employed, full-time	.250	.448	-.017	.016	-.250	.396	.009	.017
Employed, part-time	.767	.469	-.013	.018	-.093	.413	.014	.019
Number of children	-.680	.199***	-.008	.006	-.182	.180	-.003	.006
Cohabiting	-2.469	1.021*	.027	.043	-1.184	.903	.000	.046
Single	-1.676	.511**	-.002	.017	-1.246	.457**	.006	.019
Girls	1.437	.489**	-.003	.014	-.886	.447*	-.009	.015
Age at birth	.036	.039	.001	.001	.055	.036	.000	.001
Parents' English fluency	2.588	.497***	-.047	.014***	1.569	.456***	-.001	.015
Second grade	23.331	.205***	-.175	.014***	21.751	.183***	-.260	.015***
Intercept	49.112	2.926***	.705	.088***	38.572	2.652***	.685	.095***

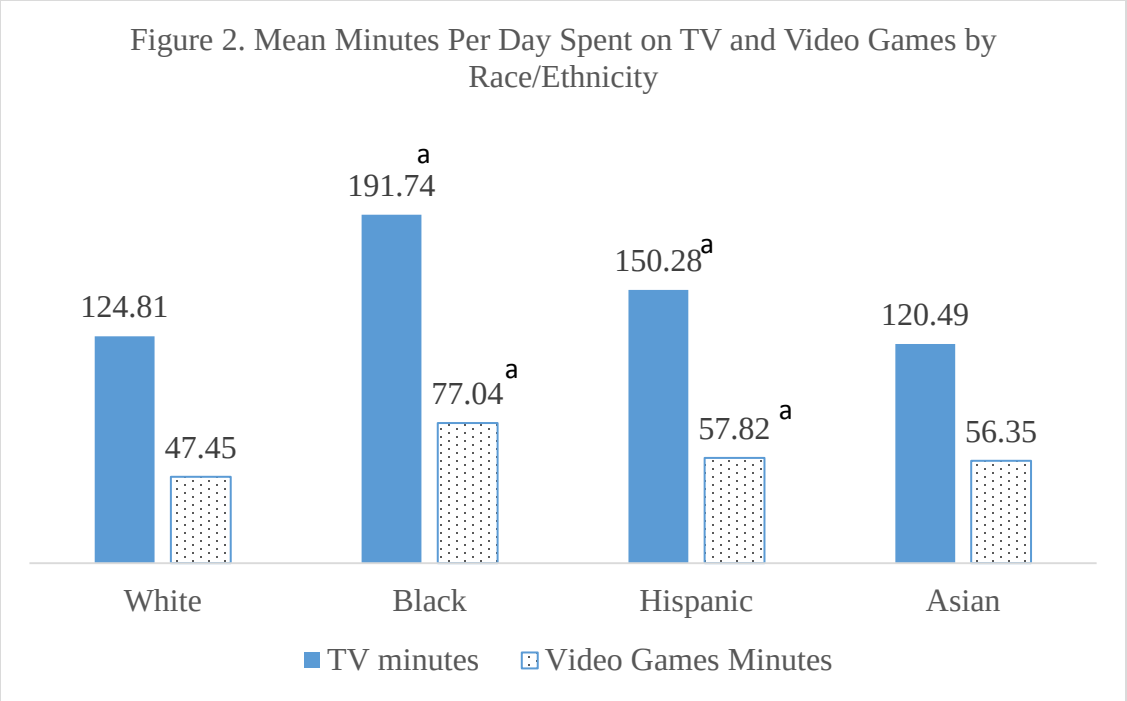
* p < .05; ** p < .01; *** p < .001. Omitted reference categories are: No summer school attendance, White, high school, married, full-time employed, boys, first grade.

Figure 1. Means for Summer Activities by Race/Ethnicity

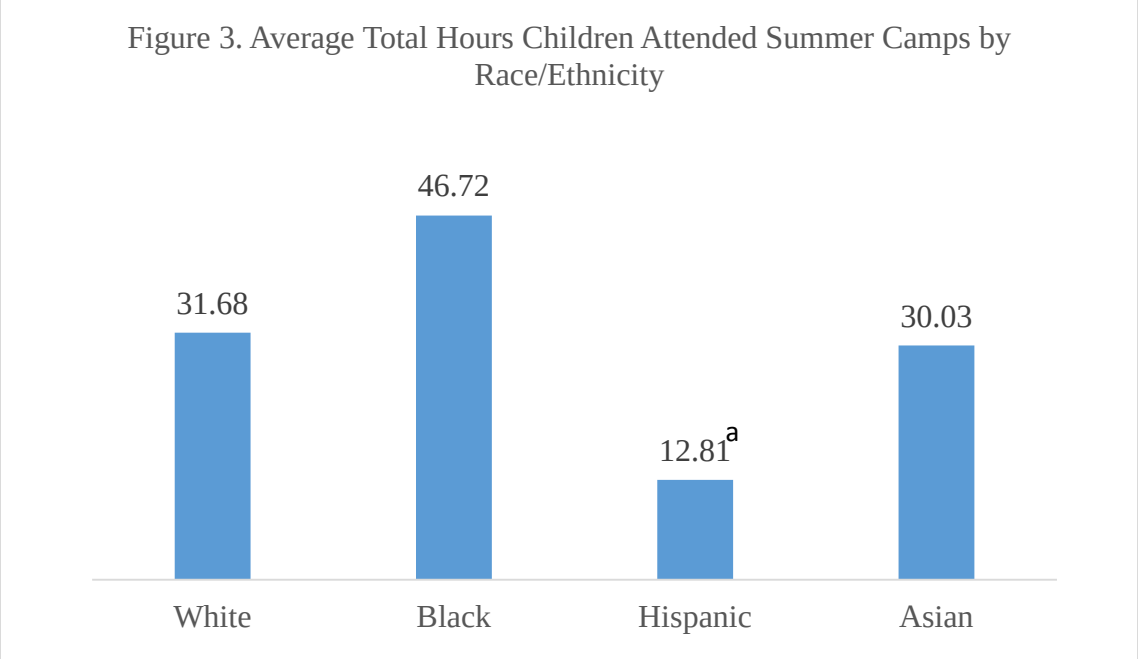


1 = never 2 = once or twice/week, 3 = 3 to 6 times/week, 4 = everyday

a Differences from White children are significant at $p < .001$.



a Differences from White children are significant at $p < .001$.



a Differences from White children are significant at $p < .001$.

Appendix. Correlation Matrix among Summer Activities (N = 4,147)

	Read alone	Computer		Adult help		Trips		Out play		TV min		VG min		Summer camp	
Read alone		.15	***	.41	***	.12	***	.04	***	-.07	***	-.09	***	.03	*
Computer				.24	***	.15	***	.05	***	.04	***	.13	***		
Adult help								.08	***	-.08	***	-.06	***		
Trips								.11	***	-.14	***	-.08	***		
Outside play										-.13	***	-.07	***	.08	***
TV min												.29	***	-.10	***
Video														-.07	***
Summer camps															