ASSESSING DEVELOPMENTAL TRAJECTORIES OF EXECUTIVE FUNCTION IN LOW-INCOME, ETHNIC MINORITY PRESCHOOLERS: OPPORTUNITIES AND CHALLENGES

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African American and Latino children in the United States experience disparities in virtually all domains of health and development. Between 2003 and 2005, the infant mortality rate among African American non-Latino infants (13.6 per 1,000 live births) was almost two and a half times the rate for European American non-Latino (5.7 per 1,000) or Mexican-origin Latino infants (5.5 per 1,000; U.S. Department of Health and Human Services, 2010). Although Latino infants, particularly those of Mexican
origin, experience more optimal birth outcomes, they experience disparities in other domains. According to the 2010 Pediatric Nutrition Surveillance Survey, Latino preschoolers had a rate of obesity 45% higher than the rate of obesity among European American non-Latino preschoolers and 52% higher than the rate among African American non-Latino preschoolers (Centers for Disease Control/National Center for Health Statistics, 2011). Overall, the parents of African American and Latino children are more likely to report that their child has experienced poor health (Braveman & Barclay, 2009; Flores, Olson, & Tomany-Korman, 2005).

A significant contributing factor to health disparities among African American and Latino children in the United States is the profound disparity in socioeconomic status present in American society. Over the past 30 years, the childhood poverty rate among African American and Latino children has been persistently two to three times the rate among European American non-Latino children (Williams, Mohammed, Leavell, & Collins, 2010). Furthermore, ethnic minority children are more likely to experience chronic poverty and to live in a neighborhood characterized by high poverty, high crime, and high levels of other physical and social incivilities (Acevedo-Garcia, Ory, McArthur, & Williams, 2008; Brooks-Gunn, Duncan, & Maritato, 1997; Caughy & Fransini, 2005).

There are also profound ethnic disparities in educational attainment. In 2006, 82.3% of African American adults in the United States had a high school degree and only 18.5% had a college degree (Williams et al., 2010). The rates of high school graduation are much lower among Latinos; only 60.3% of Latino adults have a high school degree or higher with the lowest proportion among Latinos of Mexican origin (53.9%). These rates are even lower in large, urban school districts serving large proportions of minority youth, with graduation rates for African American and Latino youth in many of the largest school districts in the country well below 40% (Freudenberg & Ruglis, 2007). Low educational attainment is a strong predictor of poor health in adulthood (Davey Smith et al., 1998), leading some to suggest that eliminating disparities in educational attainment has central importance for eliminating disparities in health (Freudenberg & Ruglis, 2007; Woolf, Johnson, Phillips, & Philipsen, 2007).

Disparities in academic achievement emerge early. When entering kindergarten, only half of Latino children could recognize letters compared with 75% of European American non-Latino children (Garcia & Gonzales, 2006). Approximately 34% of African American kindergarteners and 42% of Latino kindergarteners tested in the lowest quartile for reading skills compared with only 18% of European American non-Latino children (West, Denton, & Germino-Hausken, 2000). Comparable percentages for math were 39% and 40% in the lowest quartile for African Americans and Latinos,
THE CONTRIBUTION OF EXECUTIVE FUNCTION DEVELOPMENT TO DISPARITIES IN SCHOOL READINESS

Because of the strong continuities between a child's skills at school entry and achievement in middle school and high school, many have emphasized eliminating disparities in school readiness as critically important for eliminating disparities in academic achievement and high school completion (Entwisle, Alexander, & Olson, 2005; Kowaleski-Jones & Duncan, 1999; Morrison, Rimm-Kaufman, & Pianta, 2003; Pettit, Bates, & Dodge, 1997). Recently, there has been an increased emphasis in the research literature on the importance of child self-regulation skills for positive adjustment in kindergarten and early elementary school (Blair, 2002; Blair & Diamond, 2008; Lewit & Baker, 1995; McClelland et al., 2007; Miech, Essex, & Goldsmith, 2001; Rimm-Kaufman, Pianta, & Cox, 2000; Sekman, McClelland, Acoc, & Morrison, 2010). Blair (2002; Blair & Razza, 2007) has identified the development of metacognitive skills of executive function (EF), including working memory, attention shifting, and inhibitory control as the basis for self-regulated learning, characterized by planning, problem solving, and goal-directed activity.

Empirical evidence suggests that the development of EF skills and self-regulation is negatively influenced by socioeconomic and other contextual risk factors (Lengua, Honorado, & Bush, 2007; Mistry, Benner, Biesanz, Clark, & Howes, 2010; Sekman et al., 2010) and as such, deficits in self-regulation may be a key factor in explaining ethnic disparities in school readiness and early academic achievement. Therefore, understanding EF skill development among low-income African American and Latino preschoolers is important for the development of effective early childhood interventions to reduce and eliminate disparities in school readiness. However, very little empirical data are available on the emergence and development of EF skills among low-income, ethnic minority preschoolers—the population at greatest risk for early school failure.

Garon, Bryson, and Smith (2008) reviewed the extant literature on the development of EF skills in preschool children. Very little longitudinal data on EF development are available for very young children. Garon et al. found that either researchers did not report the race/ethnicity of their samples or
reported samples composed of 80% to 95% European-American non-Latino children. The only longitudinal studies of EF and self-regulation initiated before age 4 included virtually no ethnic minority children (Carlson, 2005; Kochanska, Coy, & Murray, 2001; Lengua et al., 2007), included only a very limited longitudinal follow-up component (Li-Grining, 2007; Spinrad et al., 2007), or did not include direct assessment of EF abilities (Raike, Robinson, Bradley, Raike, & Ayoub, 2007). The Family Life Project (FLP) has longitudinal EF data from direct assessment starting at age 36 months, and the sample is approximately 60% European American non-Latino and 40% African American and rural (Willoughby, Blair, Wirth, Greenberg, & The Family Life Project Investigators, 2010).

There is a significant need for more empirical data on the emergence of EF skills among low-income, ethnically diverse children. The Dallas Preschool Readiness Project (DPreP) was launched in 2009 with the primary aim of assembling a large cohort of ethnically diverse preschoolers to study longitudinally the emergence of EF and the relation of this developmental process to markers of school readiness. In the remainder of this chapter, we describe that project, report initial findings, and discuss the challenges of conducting longitudinal, community-based developmental research with this population.

DALLAS PRESCHOOL READINESS PROJECT

Participants in the DPreP were recruited through a wide range of community-based recruitment strategies including distribution of study information to organizations and agencies serving low-income communities such as Women, Infants, and Children (WIC) clinics, medical clinics, day-care centers, community recreational centers, and churches. Project staff also recruited participants directly by attending community fairs or frequenting other venues in low-income communities where families with young children are present such as parks or grocery stores. To be eligible for the study, the target child had to be between the ages of 29 and 31 months before the end of December 2010, have at least one parent who self-identified as African American or Latino, be living in a family with an income at or below 200% of the federal poverty level, and have been hospitalized for less than 1 week following birth. We recruited families who said they planned to remain in the Dallas-Fort Worth area for at least 1 year, and indeed very few had moved out of the city or country 1 year later, although many families changed residences and residential situations within their communities. A total of 404 children (186 girls) were enrolled in the study; their characteristics are displayed in Table 12.1. Approximately 55% of the children were Latino and 45% were African American non-Latino. African American children were significantly
TABLE 12.1
Characteristic of Dallas Preschool Readiness Study Sample (N = 404)

<table>
<thead>
<tr>
<th></th>
<th>African American (n = 182)</th>
<th>Latino (n = 222)</th>
<th>χ²</th>
</tr>
</thead>
<tbody>
<tr>
<td>Family income*</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>&lt; 50% federal poverty level</td>
<td>97 (51.8)</td>
<td>40 (19.3)</td>
<td>73.48***</td>
</tr>
<tr>
<td>50–99% federal poverty level</td>
<td>26 (14.0)</td>
<td>87 (42.0)</td>
<td></td>
</tr>
<tr>
<td>100–149% federal poverty level</td>
<td>22 (14.0)</td>
<td>56 (27.1)</td>
<td></td>
</tr>
<tr>
<td>150–200% federal poverty level</td>
<td>7 (4.5)</td>
<td>21 (10.1)</td>
<td></td>
</tr>
<tr>
<td>&gt;200% federal poverty level</td>
<td>5 (3.2)</td>
<td>3 (1.4)</td>
<td></td>
</tr>
<tr>
<td>Child gender</td>
<td></td>
<td></td>
<td>.58</td>
</tr>
<tr>
<td>Boy</td>
<td>102 (56.0)</td>
<td>116 (52.3)</td>
<td></td>
</tr>
<tr>
<td>Girl</td>
<td>80 (44.0)</td>
<td>106 (47.7)</td>
<td></td>
</tr>
<tr>
<td>Primary caregiver relationship to child</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Mother</td>
<td>182 (99.0)</td>
<td>216 (97.3)</td>
<td>73.48***</td>
</tr>
<tr>
<td>Father</td>
<td>9 (4.9)</td>
<td>3 (1.4)</td>
<td></td>
</tr>
<tr>
<td>Grandmother</td>
<td>11 (6.0)</td>
<td>2 (1.0)</td>
<td></td>
</tr>
<tr>
<td>Aunt or uncle</td>
<td>0 (0.0)</td>
<td>21 (10.1)</td>
<td></td>
</tr>
<tr>
<td>Father/father-figure in household</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>No</td>
<td>80 (44.0)</td>
<td>26 (11.7)</td>
<td>53.73***</td>
</tr>
<tr>
<td>Yes</td>
<td>102 (56.0)</td>
<td>196 (88.3)</td>
<td></td>
</tr>
<tr>
<td>Latino families only</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Preferred language</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>English</td>
<td>54 (24.3)</td>
<td>166 (74.8)</td>
<td></td>
</tr>
<tr>
<td>Spanish</td>
<td>166 (74.8)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Nativity</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>U.S. born</td>
<td>59 (26.6)</td>
<td>163 (73.4)</td>
<td></td>
</tr>
<tr>
<td>Foreign born</td>
<td>156 (95.7)</td>
<td>5 (3.1)</td>
<td></td>
</tr>
<tr>
<td>Country of origin</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Mexico</td>
<td>156 (95.7)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Central America</td>
<td>5 (3.1)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>South America</td>
<td>1 (0.0)</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

*11 families who screened eligible reported income above the eligibility cutoff at the time of the home visit. Those with incomes >300% FPL were excluded from the sample, but the 8 between 200% and 300% FPL were retained.

***p < .001

...more likely to be living in households below 50% of the federal poverty level and in households without a father present. Almost three quarters of the Latino primary caregivers in the sample were foreign born, with the vast majority of those being from Mexico. Approximately 80% of the children as well as 75% of the mothers in our Latino sample spoke primarily Spanish at
the time of enrollment. Fathers or father-figures who were living in the home were eligible to participate in the study as well. A total of 321 children in the DPreP study had a father or father-figure residing in the home at Time 1, Time 2, or both. Of these, 252 (80%) participated in at least one data collection visit. Father participation was slightly higher among African American fathers (85%) compared with Latino fathers (76%).

Data Collection Procedures

Families were visited in their homes for the first time when the target child was 2.5 years old and for a second time approximately one year later. The average age of children at the time of the first assessment was 29.79 months (SD = .63, range 28–31 months). African American children were slightly older than Latino children at the time of the first home visit, 29.87 months (SD = .69) versus 29.73 months (SD = .56), \( t(402) = 2.31, p < .05 \). The average age at the time of the second assessment was 41.2 months (SD = 1.26, range 38–46). Of the 404 children who completed the assessment at age 2.5, 363 (90%) completed the second home visit 1 year later. The follow-up rate for Latino families (93%) was higher than the follow-up rate with African American families (86%).

Each home visit followed a similar format. One home visitor conducted an interview with the primary caregiver while the other home visitor completed the assessment activities with the target child. A semistructured interaction task for the primary caregiver and child was conducted about halfway through the child assessments to give the child a break and allow him or her more freedom to move around. If the father was available during the home visit, he was interviewed as well, and a similar semistructured interaction task was conducted with the father and target child. If the father was not available or the child seemed to be fatigued, the father data collection was scheduled for another time. All child assessment activities and the parent–child interaction tasks were video-recorded for subsequent coding. Families received a $50 incentive ($100 if the father participated) and a DVD copy of the home visit. Children received a developmentally appropriate book or toy as part of the Wrapped Gift task in the EF assessment battery.

Measures of Executive Function

For assessing self-regulation and EF skills, we chose a range of activities after extensive piloting to determine which tasks worked with this population and could be feasibly implemented in home settings under a wide range of conditions. Many were drawn from the work of others who have developed self-regulation batteries for young children (Cameron Ponitz et al., 2008; Carlson, 2005; Kochanska, Murray, & Harlan, 2000). The tasks we used at each of the two assessments points are displayed in Table 12.2. Tasks that
TABLE 12.2
Measures of Executive Function

<table>
<thead>
<tr>
<th>30 months</th>
<th>42 months</th>
</tr>
</thead>
<tbody>
<tr>
<td>Snack Delay</td>
<td>Snack Delay</td>
</tr>
<tr>
<td>Wrapped Gift/Wait for Bow</td>
<td>Wrapped Gift/Wait for Bow</td>
</tr>
<tr>
<td>Forbidden Toy</td>
<td>Mommy-Me</td>
</tr>
<tr>
<td>Shape Stroop</td>
<td>Heads &amp; Toes</td>
</tr>
<tr>
<td>Mommy-Me</td>
<td>Dimensional Change Card Sort</td>
</tr>
<tr>
<td>Walk-a-Line Slowly</td>
<td>Memory Chocolates</td>
</tr>
</tbody>
</table>

were used at 30 months but not at 42 months were dropped to keep the entire home visit within a reasonable length (1.5–2 hours). Several tasks were used at 42 months but not at 30 months because our pilot work suggested a floor effect at 30 months due to task difficulty. Because detailed descriptions of most of these tasks can be found elsewhere (Carlson, 2005; Garon et al., 2008; Kochanska et al., 2000), we will describe only the tasks that are less commonly used. Mommy-Me is a Stroop-like task developed by Bell and her colleagues (Bell, Hubble, & Morasch, 2010) in which children are presented with pictures of both themselves and their mothers. Children are instructed to point to the picture of themselves when told “point to mommy” and that they are to point to the picture of their mother when told “point to [child’s name].” Memory Chocolates is a forward digit span test of working memory developed especially for this study. The child is presented with a heart-shaped plastic box that contains spaces for 12 differently shaped plastic chocolate candies with removable lids (Smart Snacks Hide ‘n’ Peek Chocolates by Learning Resources, http://www.learningresources.com). Only six of the plastic chocolate candies were used for the assessment at age 42 months. Under the lid of each chocolate is a sticker of one of six different animals: cat, elephant, fish, lion, rabbit, or horse. After naming and teaching trials, the child is asked to find one animal (e.g., “cat”), two animals (e.g., “cat”, “fish”), and so on in a forward digit span-like memory test.

Scoring Procedures

EF tasks were scored using coding systems developed by others. Each of the four Snack Delay trials was coded on a 7-point scale reflecting if or when the child picked up the candy (0 = ate candy before delay halfway point; 6 = waited until bell rang), and the scores from the four trials were averaged. The Wrapped Gift/Wait for Bow task was coded for the nature of the child’s peeking and nature of touching the gift as well as latencies to peek, touch, lift, and open the gift. These scores were standardized and averaged such that higher scores indicated greater self-regulation. Similarly, the Forbidden Toy task was coded for type of engagement and latency to engagement and these
scores were standardized and averaged. The Shape Stroop and Mommy-Me tasks were coded in two different ways. First, following the same coding system used by Kochanska (Kochanska et al., 2000) and Carlson (2005), each trial was coded on a 3-point scale (0 = incorrect, 1 = self-correct, and 2 = correct), and the test trials were averaged. However, because only 31% of our sample at age 30 months were able to complete the naming and practice trials and make it to the test trials for Shape Stroop, and only 6% made it to the test trials for Mommy-Me, we followed the example of Bell and colleagues (2010) in coding the full range of child responses across the administration of the task. On each task, children were categorized into one of seven groups: refused, could not pass naming trials, naming trials correct, practice trials correct, one to two test trials correct, or three to four test trials correct.

Performance on Tasks in the DPRelP Sample at 30 Months

In selecting EF tasks for DPRelP, we looked to the literature to identify tasks that best discriminate individual differences in 2.5-year-olds. Carlson (2005) provided summary data on the average pass rates of more than 600 mostly middle-class European-American children from age 24 months to 6 years on a large variety of EF tasks. However, in the course of piloting the tasks with children in our target population, it was apparent that children were not able to complete the tasks at the same pass rates for children of similar ages reported in the literature. The discrepancy was more apparent in tasks involving attentional conflict, such as Stroop-like tasks, than in tasks requiring children to inhibit their impulses to touch a desired object. To examine more closely differences in performance on a task requiring inhibition to touch an attractive object, we compared performance of the children in the DPRelP sample on the Wrapped Gift task with data reported by Kochanska, Murray, and Harlan (2000). Kochanska enrolled a sample of 112 children at age 9 months and reassessed them at 14, 22, and 33 months. The Snack Delay task was administered at 22 and 33 months. In Figure 12.1, we display a comparison in the latencies to peak during the wrapping phase as well as latencies to touch, lift, and open the gift during the Wait for Bow phase. Children in the 30-month DPRelP sample peaked during the gift wrap phase of the task just about as quickly as the 22-month-olds did in Kochanska’s sample. However, during the Wait for Bow phase, DPRelP children waited the longest before touching the gift and waited an intermediate time before lifting and opening the gift as compared with the 22-month-olds and 33-month-olds in Kochanska’s sample.

Performance differences between the DPRelP and other samples of preschoolers on tasks that involved some form of attentional conflict were more striking. In Figure 12.2, we display the average test scores on the Shape Stroop
to identify deficits. Carlson and associates (2010) tested children 24 months of age or older and make test trials in the task.

**Figure 12.1.** Wrapped gift performance in two samples of preschoolers.

**Figure 12.2.** Average Shape Stroop scores in three samples of preschoolers.
task for our sample compared with data reported by Kochanska (Kochanska et al., 2000) and Carlson (Carlson, Mandell, & Williams, 2004). Kochanska et al. (2000) collected Shape Stroop data at both 22 and 33 months of age, whereas Carlson et al. (2004) collected Shape Stroop data at age 24 months only. Similar to the Kochanska et al. sample, Carlson et al.'s sample was overwhelmingly European American and middle class. As can be seen in the figure, the 30-month-old children in the DPReP sample performed most similarly to the 22-month-old children in Kochanska's sample and significantly poorer than did the Kochanska sample at age 33 months and the Carlson sample at age 24 months. What is also striking from the figure is that Shape Stroop test scores were available for only 125 (31%) of the DPReP sample at 30 months because the remainder of the children failed to successfully complete the naming and teaching trials of the task and therefore could not be tested. Kochanska et al. did not report whether any of the children in their sample failed to make it to the test trials, and Carlson et al. reported test data for over 90% of their participants. The much higher task failure rate among the DPReP children suggests that the mean test score overestimates the EF skills in this population because it fails to capture the full range of child performance on the task. To address this shortcoming of relying on the mean test score for those relatively few children who completed test trials, we followed the lead of Bell et al. (2010) and scored each child on a 7-point scale based on whether he or she refused, succeeded at the naming trials, succeeded at the teaching trials, or succeeded at the test trials. Children were grouped based on the highest category they achieved. A comparison in the performance between the two samples is displayed in Figure 12.3. Almost half of the DPReP sample either

![Graph showing data comparison between two samples.](image)

*Figure 12.3. Shape Stroop performance in two samples of preschoolers.*
refused (15.1%) or failed the preliminary naming trials (33.5%) for the task. The frequent inability of children in the DPREP sample to name the fruits used in the Shape Stroop test underscores the importance of stimuli selection when implementing EF assessments in diverse populations. Pictures of the stimuli used in our Shape Stroop (shown in Figure 12.4) were the same as those used in Bell's lab. Is it possible that children in our sample had less exposure to these fresh fruits, or was it an issue of not recognizing them in cartoon form? We examined whether there was a difference in naming success by child ethnicity, but the Latino children in our sample failed at the naming trials at the same rate (34%) as did the African American children in our sample (33%). The failure of the children in the DPREP sample to successfully name the fruits used in the Shape Stroop task raises questions regarding its validity as a measure of EF in this ethnically diverse, low-income sample, particularly at the age of 30 months.

As described above, we also administered a Stroop-like task developed by Bell et al. (2010) called Mommy-Me in which the stimuli were pictures of the child and his or her mother. A comparison of the performance of our sample of children with a sample of eighty-one 24-month-olds reported by Bell et al. (2010) indicated that Mommy-Me is a more difficult task than Shape Stroop. Although Bell's sample of 24-month-olds still outperformed the 30-month-olds in our sample. Only 13.5% of the children in Bell's sample and 6.2% of the children in the DPREP sample made it to the test trials on Mommy-Me, compared with 29.6% and 30.9%, respectively, on the Shape Stroop task. It is interesting that none of the children in the DPREP sample failed the naming trials of the Mommy-Me task, which suggests that using stimuli that are familiar to the child (in this case, a picture of the child's mother and of the child) may be one way to overcome differences in familiarity with stimuli that might limit the validity of implementing other tasks with diverse populations. In addition, the lower success rates in both samples in the Mommy-Me task compared with Shape Stroop suggests that pointing to a picture of mommy is a stronger prepotent impulse than is pointing to a picture of a "baby" fruit.

![Figure 12.4. Stimuli used in Shape Stroop task. Copyright Martha Ann Bell. Reprinted with permission.](image-url)
CHALLENGES AND OPPORTUNITIES
IN CONDUCTING LONGITUDINAL RESEARCH
IN DIVERSE, LOW-INCOME COMMUNITIES

Collecting valid longitudinal data on the development of EF in ethnically diverse, low-income children is critically important not only for developing effective interventions but also for describing how developmental processes are similar or different across disparate populations. Developmental scientists, particularly those studying basic developmental processes in very young children, have relied on convenience samples of children from predominantly European-American middle-class families, with notable exceptions (Blair et al., 2011; Lengua et al., 2007; Li-Grining, 2007). A major hindrance to expanding the literature to include more ethnically diverse groups of children is that following such children longitudinally presents a number of challenges rarely discussed in empirical reports of study findings. In this section, we describe some of the challenges we have encountered in implementing the DPReP in hopes that this information can be helpful to others interested in working with similar populations.

Diverse and Changing Household Compositions

Many of the children in the DPReP sample lived in households that frequently did not fit neatly into one of our preconceived categories of household structure. Such situations were more common among our African American than our Latino participants. For example, we had several children for whom the primary caregiver was reported to be the mother but experiences in the field led staff to question this. In some situations, the child was living with the grandmother the majority of the time and the mother appeared to be visiting solely for the purpose of participating in the home visit. In other situations, the child moved between the mother’s home and the homes of other adult relatives on a regular basis. In yet another situation, the biological father of the target child lived with the child and the child’s mother for half the week and lived with his own parents the remainder of the week. Such fluid family structures and household boundaries are consistent with qualitative research on African American families that documents the utilization of extended kin as well as fictive kin networks in childrearing (Burton & Jarrett, 2000; Nobles, 1988; Stewart, 2007). This situation created practical challenges for scheduling, particularly during the summer months when movement between households was more frequent. One consequence was a lower follow-up rate in our African American sample (86%) compared with our Latino sample (93%).

Although Latino households in our sample were more stable over time, we encountered other, unanticipated challenges. Although the vast majority
(88%) of the Latino children in our study had a father living in the home at the time of the first home visit, the work situations of many of the Latino fathers made securing participation very difficult. Once we were in the field recruiting participants, we discovered a high number of Latino fathers were regularly traveling outside the city or even state for work, and we started recording more specifically how frequently the father was present in the home. Even Latino fathers who were not traveling to jobs often worked multiple jobs, especially during the spring and summer, and were infrequently at home and available to participate in a home visit. Furthermore, work schedules were unpredictable, and it frequently occurred that a home visitor would arrive at the home to discover the father had been called in to work at the last minute.

As a result of these challenges, we maintained maximum flexibility when completing father data collection. We had one team member, a native Spanish speaker and well known member of the Latino community in Dallas, who dedicated herself to completing father data collection. She scheduled visits with fathers at all hours of the day or night and every day of the week. Because of her connections in the Latino community, she was successful in convincing many fathers who were reluctant to be video-recorded to participate. (Generally speaking, we found African American fathers were much less resistant to participation than were Latino fathers in our sample, in part, we think, because they were more often not employed.) As a result, we were able to secure an unusually high rate of father participation as compared with other studies with similar populations of fathers.

Challenging Situations in the Home and Community

Any researcher who collects data in high-poverty neighborhoods has encountered a range of situations that present challenges to completing data collection activities, and the DPReP is no different in that regard. Although such instances were not frequent, research staff did encounter shootings while in the field or adult participants who were behaving or dressed inappropriately at the time of the home visit. It is important when hiring staff for a project such as this to hire individuals who are savvy about being in the community in terms of how they dress, how they act, and how they approach community residents.

As the first author of this chapter found in her work in Baltimore and we have found in our work in Dallas, having members of the community as part of the research team can be invaluable for ensuring the safety of research team members. Our team members who were familiar with the community could often anticipate problems before they arose. Throughout our fieldwork, we encourage our staff to rely on their instincts to dictate when it is safest to leave a situation without collecting data.
In addition, because our research team members who had ties to the community had long histories with their respective communities (both were mothers in their 40s), our research teams were able to connect with families in a way that supported recruitment and enhanced retention. Our research team members often knew other relatives of participating families, and being able to talk about these connections fostered a bond between the research team and family. These bonds were evident in rapport and scheduling calls, when families often asked if a particular team member would be attending the scheduled home visit. In such situations, the family might not agree to participate unless that particular team member was coming or if that individual could reassure the family firsthand about the team members who were scheduled to visit. Our research team has achieved an extraordinarily high retention rate with a population that is notoriously hard to track. We believe our experience underscores the importance of the relationship that is formed between the participant and the research team. Being sensitive to the bonds that participants form with particular research team members through all contacts with the family is critical for maintaining engagement and participation in the study.

Conditions in the homes can also present unique challenges for collecting valid EF data. Distractions during testing should be minimal so the child can focus on the task and perform to the best of his or her ability. However, many of the homes of the families in our study provided less than an ideal environment for data collection. Many families, especially the Latino families, were living with multiple families in the same residence. Some families were restricted to living in a single bedroom, for example, or were confined to a living area subdivided from a larger living area by hanging sheets. Ambient noise sometimes made hearing the recorded voices of participants difficult. During the summer of our follow-up visits, the Dallas area experienced record-breaking heat, with triple-digit temperatures every day for almost the entire summer. Many of our families could not afford the cost of air conditioning and turned off their units during the day, making home visits challenging to complete.

Despite the challenging conditions often encountered, we were encouraged by the positive reception our researchers received from many of the families who participated. The vast majority of parents in our study were very interested in how their child was developing and whether their child would be ready to enter school. For a number of families, our home visit was an important occasion for which parents took time off from work and other family members came to observe. Other challenges were presented, however, when additional family members, eager to witness the child's performance, added to the already overcrowded situation and sometimes interfered with the child's performance with verbal encouragement and prompts. The high
level of engagement of families with our study was evident when a number of families, when contacted for the follow-up visit, agreed even though they had not realized they would receive a financial incentive for the second visit. In addition, when we contacted some families about the follow-up visit, we discovered they had been anticipating our visit by practicing the tasks with their child as seen on the DVD we had sent after the first home visit as a thank you gift. We consequently altered our follow-up procedure and omitted those tasks from the thank you DVD that could potentially be practiced based on viewing the DVD.

Our experience with many of the fathers in our study provided a picture that is in contradiction with commonly held perceptions of absent fathers in low-income households, especially African American, households. Although a large proportion of the African American children in our sample (44%) did not have a father living in the household with them, many of the fathers who were there were exceptionally engaged with the research process. As stated previously, it was common to have a father take a day off work to be present at the home visit. In addition to the 5% of African American families and 1.4% of Latino families in which the father was the primary caregiver, we had a number of fathers who actively participated in all parts of the data collection including sitting next to the mother during her interview and providing additional information on the questions being asked. Our preliminary analyses of data from our 30-month home visit suggests that sensitive supportive fathering is uniquely associated with better EF performance, particularly for African American children. Although collecting data on fathers is challenging in a number of ways, our experience suggests that it is feasible and has the potential for adding invaluable information to our understanding of the factors contributing to the development of EF among low-income, ethnically diverse groups of young children.

**CONCLUSION**

Early childhood education intervention efforts such as Head Start that strive to tackle prevailing deficits in school achievement among low-income minority children in the United States have increasingly emphasized the importance of literacy and numeracy skills in their efforts to foster school readiness in low-income children. However, evidence points to the need to understand and support the young child’s development more broadly. Growing evidence of the links between children’s emerging EF skills and school achievement suggests that individual differences in these skills are important for processing and integrating information and regulating behavior in social interactions (Blair, 2002) and may be a source of ethnic disparities in
school readiness and early academic achievement. Unfortunately, the bulk of what is known about the development of behavior regulation and EF among very young children comes from middle-income European American children, rather than from children at greatest risk for poor school achievement and health. A major purpose of the DPreP is to help remedy this general dearth of data on the development of these skills among low-income African American and Latino preschoolers.

The findings presented in this chapter pertaining to the self-regulation skills shown in our children in the first wave of planned longitudinal assessments indicate that deficits in fundamental EF skills of simple and more complex response inhibition that involves attention focusing and attention shifting start early in these low-income children. Comparisons made of early EF skills between our low-income African American and Latino preschoolers and published data based on similar measures of middle-class mostly European American preschoolers indicate considerable self-regulation skill deficits of approximately 8 months, or more than a 25% delay at the early age of 2.5 years. These early deficits in EF skills suggest that greater emphasis on targeting and supporting the development of these skills in low-income children at an early age may advance the effectiveness of early childhood interventions to improve school readiness and eliminate school achievement disparities.

Variations in the early emergence of these skills were also evident in this study's first step in assessing developmental trajectories of EF in low-income African American and Latino children. In these preschoolers who were 2.5 years of age when first assessed for EF skills, even the simple response inhibition tasks presented a considerable challenge for a majority of the children. Meaningful variations would have been obscured by floor effects had we measured EF skills only by enumerating correct responses, given the very few children who showed evidence of "passing" responses, particularly in the more complex response inhibition tasks. We thus advocate our approach, based on Bell's EF rating classifications (Bell et al., 2010), that measures task understanding and foundational skills involved in the assessment of EF, such as the ability to discriminate and name task stimuli (e.g., the pictured pieces of fruit).

Our 1-year follow-up of study families has demonstrated an extremely low attrition rate despite having a study population that included a large proportion of families at high risk whose lives are very unstable and mobile. Our success in tracking participants is largely due to enlisting data-collection home visitors who are a part of and know well the families' communities, demonstrating that a community-engaged approach can enhance the effectiveness of longitudinal studies with ethnically diverse low-income populations. We expect the study will yield a new understanding of the development
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self-regulation of EF skills in the context of poverty and parent-child relationships, and the early results presented in this chapter are an important first step. It is our hope that this new knowledge will help shape effective supports for children's school readiness in ways that will serve to close the achievement gap that has been such a challenge to bridge.

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