Bilingualism and Academic and Social Development

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Specific Aims

The aim of this study is to investigate the academic and socioemotional trajectories from kindergarten to fifth grade for children with different language abilities at kindergarten entry. Specifically, this study aims to assess the extent to which developmental paces differ for children who only speak English at home when starting school and children who speak both English and a non-English language at home upon school entry.

This issue is important for several reasons. First, the use of non-English languages at home has increased significantly over the past few decades due to concentrated immigration from Latin American and Asian countries (U.S. Census Bureau, 2003). Correspondingly, children of immigrants are projected to have accounted for more than half of the recent growth in the school-aged population by 2050, a trend that is not predicted to change in the near future (Capps et al., 2005; Passel & Cohn, 2008).

Second, the concomitant rise of English Language Learner (ELL) students in U.S. public schools and ELL's startlingly high relationship with poor academic achievement has sparked debate about policies and programs that may improve these students' school performance. The policies and programs that have been put into place thus far, as well as the public debates surrounding them, have generally been guided by the belief that English-only instruction is the optimal way to improve the academic performance of ELL students. However, a growing body of research has documented the benefits of bilingual fluency to various academic outcomes (e.g., Golash-Boza, 2005; Portes & Hao, 1998, 2002, 2004; Portes & McLeod, 1999; Portes & Schauffler, 1994; Portes, 1999), challenging the notion that a rapid shift to monolingual English fluency is best for children's educational success.

Third, the language-shift literature has consistently documented that children of immigrants quickly show proficiency in and a preference for speaking English, and despite the slower language transition for some Latinos, monolingual fluency in English is very high by the third generation across all

countries of origin (Alba et al., 2002; Carliner, 1999; Portes & Hao, 1998; Portes & Shauffler, 1994). Researchers have thus begun to investigate whether the loss of bilingual proficiency during students' transition to English monolingualism negatively affects their school performance.

In addition to the more obvious relationship between children's language abilities and academic outcomes, it is also important to examine the relationship between children's language abilities and socioemotional outcomes, particularly because ELL students may feel isolated if they are unable to communicate well with teachers and peers. Moreover, including an analysis of socioemotional outcomes makes for a more complete analysis of academic trajectories (Alexander & Entwisle, 1996; La Paro & Pianta, 2000; Saft & Pianta, 2001; Sbarra & Pianta, 2001) because of the close, empirically documented relationship between socioemotional skills and school readiness and success (Entwisle, Alexander, & Olson, 2005; Raver, 2002; Segal, 2006; Shonkoff & Phillips, 2000). For example, early behavior, conduct, or peer problems in school have been found to be linked to an increased probability of later dropout and delinquency (Dodge, Pettit, & Bates, 1994; Parker & Asher, 1987; Richman, Stevenson, & Graham, 1986; Rose, Rose, & Feldman, 1989; Wehby et al., 1993). This issue is of special importance for young children given the relative plasticity of socioemotional trajectories during the early school years (Alexander & Entwisle, 1996; La Paro & Pianta, 2000; Saft & Pianta, 2001; Sbarra & Pianta, 2001). For these reasons it is vital to understand what roles if any the school environment plays in shaping the early socioemotional trajectories of young children, not only in order to foster positive long-term socioemotional well-being but also in order to promote better educational outcomes (Entwisle & Alexander, 1999; La Paro & Pianta, 2000; NICHD ECCRN, 2003, 2004, 2005; Piatna & Walsh, 1996; Saft & Pianta, 2001; Sbarra & Pianta, 2001).

Given all of this evidence, it is important to understand why bilingual children's academic and socioemotional outcomes are different from their monolingual counterparts and how public policy might draw upon these children's strengths to promote their success in school. Understanding the

deficits associated with native language loss is especially urgent because children in immigrant families already make up a significant share of the U.S. student population. Moreover, the benefits of bilingual fluency cut to the heart of debates surrounding the appropriateness of English-only instruction for children of immigrant *and* native-born families given the increasing demand for multilingual speakers in the new global economy. In other words, the very idea of what constitutes school success may have to be reconstructed to stay relevant to an evermore global society, and bilingual children have an invaluable skill to succeed in this alternative framework. Unfortunately, it remains unclear exactly how bilingualism is associated with academic and socioemotional trajectories, partly because previous studies have not used longitudinal data that include more than 3 assessment points, and partly because no studies have examined children in their early school years.

Further disentangling the mechanisms behind this important empirical relationship requires a solid methodological framework and data source. The present work uses the Early Childhood Longitudinal Study-Kindergarten cohort (ECLS-K), which includes a large, contemporary cohort of children who entered kindergarten in the 1998/1999 school year and who have since been followed longitudinally through fifth grade (and will ultimately be followed until twelfth grade). Growth-curve modeling is used to evaluate the academic and socioemotional trajectories of children with different language use patterns.

This study focuses on Latin American and Asian ethnic groups because they have been and are projected to be the fastest growing ethnic groups in the United States, because the research to date has found that they exhibit significantly different academic performance than non-Hispanic White children, because they are among the immigrant groups most likely to speak languages other than English, and because a longstanding empirical void has largely prevented us from understanding their developmental trajectories.

Background and Significance

Lack of English proficiency is a salient issue among schools serving children of immigrants. Fully 5% of all U.S. school children are identified as ELL, while 60% of all ELL children are in grades K-5 (Fix & Passel, 2003). Although English proficiency is linked to generational status, it is erroneous to assume that all ELL students are foreign born. In actuality, only 35% of all ELL students are foreign born and 80% of all ELL students have been in the U.S. for more than 5 years.

In the immigrant literature, lack of fluent English ability was once considered to be one of the major reasons for the long-held finding that children of immigrants, particularly those of Latin American origins, exhibit *generally* poorer academic performance than native-born, non-Hispanic White children. Given that all academic tests are evaluated in English, the trend to help students become English proficient as fast as possible seems to make sense on the surface. However, more recent research on the benefits of bilingualism to children's academic performance challenges this common-sense perspective and the older waves of research.

Through the first half of the 20th century, bilingualism was considered in the linguistic and psychological literature to be the cause of poor educational and cognitive outcomes among children of immigrants (Brigham, 1923; Smith, 1939). Research in the latter half of the last century helped contradict this view by better controlling for the importance of family socioeconomic status and distinguishing between fluent and limited bilinguals (Portes & Hao, 1998). Findings from this line of research have shown the beneficial relationship that bilingual fluency has with various outcomes such as higher math and reading scores (Golash-Boza, 2005; Mouw & Xie, 1999; Portes, 1999; Portes & Hao, 1998, 2002, 2004; Portes & McLeod, 1999; Portes & Schauffler, 1994), higher self-esteem (e.g., Portes & Hao, 2002), and stronger family cohesion (e.g., Portes & Hao, 2002; Tseng & Fuligni, 2000). Scholars have generally explained bilingualism's positive effects through its relationship to greater cognitive flexibility and abstract thinking skills (Bialystok, 1988; Duncan & De Avilla, 1979; Rumbaut, 1995; Willig,

1985), as well as through the access that bilingual children have to positive "cultural capital" in their ethnic families and communities (Bankston & Zhou, 1995; Borjas, 1992, 1994; Coleman, 1988; Stanton-Salazar & Dornbusch, 1995; Matute-Bianchi, 1991; Portes & Rumbaut, 2001; Portes & Zhou, 1993; Rumberger & Larson, 1998; Zhou & Bankston, 1994, 1998).

Additionally, bilingualism is an indicator of linguistic assimilation. This is because language is not only a means of communication, but also deeply related to ethnic identity. Being bilingual thus may represent the preservation of one's ethnic values and beliefs. As illustrated in Portes and Zhou's "segmented assimilation theory" (1993) and the empirical research that has tested it, the immigrants who successfully move into the upper socioeconomic classes are likely to be those who maintain their ethnic culture and values while achieving economic integration (Rumbaut, 1994; Portes & Zhou, 1993; Zhou, 1997).

Although some research has been conducted on bilingualism, most studies have focused on adolescents, leaving a void in our knowledge of how bilingualism is associated with children's academic and socioemotional developmental trajectories, particularly during their early school years. Filling this void is particularly important given that a large body of research has shown the significance that this time period has for later academic and social development (for a review see Shonkoff & Phillips, 2000). Specifically, the school entry point is considered to be a "critical period" for children's academic and social development (Entwisle & Alexander, 1989; Pianta & Walsh, 1996) and to factor greatly into their later development (Burchinal etl al., 2002; Entwisle & Alexander, 1998). Studies have also shown that the levels of achievement and socioemotional outcomes formed by third grade are highly stable thereafter (Entwisle & Alexander, 1999; Rutter & Maughan, 2002; Sbarra & Pianta, 2001). This suggests that the learning and development of children of immigrants will be affected in part by how well schools understand their cultural contexts and unique experiences. It is thus important to identify early on the experiences that help to prepare children for success or put them at risk in the primary grades. This is

especially pressing for children of immigrants given the dearth of empirical research on their developmental trajectories, both in general and within the context of school environments that quickly push them into English-only instruction.

In her description of the developmental process of children aged 6 to 14, Eccles (1999) provided valuable insight as to how the school environment can sometimes inhibit the healthy development of students in middle childhood. Developmentally, age 6 is a pivotal time, which is characterized by a child's increased ability to reason and coincides with the beginning of formal education, when children are confronted with issues of social comparison and competition on a larger scale than they have likely experienced before. As school progresses, children may also receive "failure feedback," which can result in decreased confidence in their abilities or future success, destructive orientations towards school, and negative educational trajectories. Although not mentioned by Eccles (1999), these patterns may be felt more acutely by children of immigrants, whose introduction to school may not only represent their first nonfamilial social environment, but also their first time in a different cultural environment. The negative effects of social comparison and failure feedback may have unique implications for students who are beginning to see their own cultural identities as different from those of their peers. ELL children may feel especially discouraged and insecure around their fluent classmates.

The literature on education, child development, and immigrants presents a rich background on immigrant diversity, educational success and challenges, school characteristics, and the critical importance of early childhood in establishing positive developmental trajectories. To contextualize this information in a meaningful way that helps promote the healthy development of children of immigrants, special attention must be paid to the roles of language and how they are treated within the school environment.

The Importance of the School Environment

While the family undoubtedly serves as the most important force in children's learning and

development, the school serves as yet another important influence by being children's first connection to the external macro-environment and the place where they spend the majority of their daytime hours. Indeed, segmented assimilation theory postulates that the extent of assimilation depends on the resources available to the children from within and outside the family. In this case, the resources available at school would undoubtedly complement and/or supplement a family's resources to allow the children to have an optimal learning environment. At the same time, the school plays an important role in helping children retain their ethnic identity (i.e., by maintaining or improving his/her native language) so that they can achieve selective acculturation, which is considered to be very beneficial for children of immigrants in segmented assimilation theory. A large body of literature has shown that schools can affect children's academic performance both negatively and positively. In addition to the importance of the interaction between teachers and students and the perceptions of teachers, (Burchinal, et al., 2002; Early et al., 2007; Entwisle & Alexander, 1998; Pianta, La Paro, Payne, Cox, & Bradley, 2002; Werner & Smith, 1989), the school's structural resources and learning environments (Bennett, Elliott, & Peters, 2005; Borman & Overman, 2004; Pianta, Stuhlman, & Hamre, 2002; Rutter & Maughan, 2002; Suárez-Orozco & Suárez-Orozco, 2001; Valenzuela, 1999) are certainly important in this regard.

For example, teachers' perceptions of first graders have been found to differ systematically by race and class, and are in turn related to student performance as much as 9 years later (Entwisle & Hayduk, 1988). Males, minority-group members, and children of low economic status are rated to be less competent, tend to obtain lower marks, and are more likely to fail a grade in elementary school (Alexander, Entwisle, & Dauber, 1994; Bianchi, 1984; Sbarra & Pianta, 2001); later on, these children are more likely to drop out of high school (Ensminger & Slusarcick, 1992). Teachers have been found to have less positive (or more negative) interactions with students from low-income families or with children in schools with a high concentration of students living in poverty (Pianta et al., 2002). This is especially harmful because teacher-child relationships matter greatly to children's academic and socioemotional

development and their resulting achievements, and it is possible that these early school experiences may be the most influential of all (Baker, 1999; Hamre & Pianta, 2001; Masten, 1994; Pianta & Walsh, 1996; Saft & Pianta, 2001; Stuhlman & Pianta, 2004).

The educational literature has identified a number of important factors related to the school environment that may promote or inhibit children's learning (Benard, 1991; Borman & Overman, 2004; Crosnoe, 2005; Griffith, 2002, 2003; Herdenson & Milstein, 1996; Huff & Trump, 1996; Lee & Burkham, 2002; McNeal, 1997; Moody, 2001). These factors include school student composition (e.g., members of non-White, low-income, ELL groups), students' academic performance (a proxy for peer group characteristics, thus a high percentage of high-achieving students may create a positive learning atmosphere; Borman & Overman, 2004), and the school's efforts in providing an optimal learning experience (e.g., communication to parents about children's learning process and curriculum, teacher's efforts in supporting students' learning). For example, schools with strong principal leadership and adequate resources (e.g., physical space, teaching materials) may provide protective factors that mitigate school failure. Recent research has supported this perspective, finding that students in such schools perform better academically than their counterparts in under-resourced schools (Bennett et al., 2005; Borman & Overman, 2004; Comer, 1984; Masten, 1994). Further, a safe and orderly school environment seems to help reaffirm the types of positive social behavior that resilient children often possess (Lee, Winfield, & Wilson, 1991; Masten, 1994; Smith & Carlson, 1997). In contrast, schools that serve low-income, minority, and immigrant children have been found to jeopardize student performance by failing to provide a supportive school climate, mainly by institutionalizing low academic expectations, by having inadequate educational resources, and by experiencing high levels of teacher and administrator turnover (e.g., Borman & Overman, 2004; Matute-Bianchi, 1986; Ogbu, 1991; Valencia, 2000; Valenzuela, 1999). Indeed, it has been found that students who attend schools with high

concentrations of underachieving, poor, and minority students may be at increased risk for academic failure (Wang & Gordon, 1994).

Apart from how language instruction helps ELL students improve their overall proficiency, one of the most important school-level factors of such instruction is how it assists these children to communicate better with teachers and peers. The communication skills of children of immigrants may in turn have profound implications for their adaptation to the school environment, their socioemotional well-being, and thus their academic achievement (Suárez-Orozco & Suárez-Orozco, 1995, 2001). In an effort to improve the English language abilities of children of immigrants, both English-only and bilingual instruction approaches have been implemented within (in-class) or outside of (pull-out) the mainstream classroom. Although a wide range of language instruction programs have been implemented across schools, districts, and states (August & Hakuta, 1997; Cziko, 1992; Lucas, Henze, & Donato, 1997), English-only services have prevailed but in general run the risk of shifting children of immigrants to English monolingualism at the expense of developing their native language abilities. In contrast, bilingual instruction ideally supports the simultaneous development of both English and the native language. To the extent that bilingualism is related to children's academic and socioemotional outcomes, these programs could have very different influences on children's development.

More importantly, whether or not a school provides a learning environment that supports optimal academic and socioemotional outcomes is to a large extent dependent upon the continuity and stability of that environment (Pianta & Walsh, 1998). For example, a well-designed bilingual program may not fully promote children's academic performance if it is only provided to students for a short period of time. Likewise, a high level of teacher turnover may also reduce the benefits of a well-designed curriculum because of the discontinuity and interruptions it brings to children's learning process. The importance of continuity and stability to children's outcomes indicates that these factors are necessary in creating an integrated and learner friendly school environment, which also requires, for

example, qualified teachers, sound leadership, and a well-constructed curriculum.

Unfortunately, children of immigrants are more likely to attend schools with multiple risk factors that put them in a disadvantaged position to achieve school success (Conchas, 2001; Kasinitz, Mollenkopf, & Waters, 2004; Moody, 2001; Orfield & Yun, 1999; Suárez-Orozco & Suárez-Orozco, 1995, 2001). For example, children of immigrants are very often found to attend schools with a high concentration of minority students, crowded classroom space, inadequate supplies of textbooks and materials, and high levels of teacher and administrator turnover (Crosnoe, 2005; Kasinitz et al., 2004; Suárez-Orozco & Suárez-Orozco, 1995, 2001). In addition, previous studies have shown that the academic performance of some groups of immigrant children has been hindered by discriminatory treatment from teachers (e.g., labeling Mexican children as less industrious than Asian American children) (Conchas, 2001; Moody, 2001; Suárez-Orozco & Suárez-Orozco, 1995, 2001). The integrative model developed by García Coll and her colleagues (1996, 2004) indicates that children's behavioral, emotional, and cognitive development are greatly influenced by their daily experiences and surrounding environments, both of which are significantly shaped by class position, discrimination, and oppression. Schools (e.g., resources, teacher-child relationships, academic standards) are affected by social position (e.g., race/ethnicity, social class, and gender), racism (e.g., prejudice, discrimination, institutionalized or symbolic oppression), and segregation (e.g., residential, economic, and social and psychological), all of which have impacts on the development of minority children and families. Thus, for example, if teachers and school administrators do not have a high level of respect for children's native language abilities and culture, then it is unlikely that the school would be able to implement a bilingual instruction program that would successfully promote children's language abilities and related academic outcomes (Lucas et al., 1997). The integrative model and the research above suggest that students in schools with fewer resources and less advantageous characteristics are effectively segregated into an inhibiting learning environment that could very well stunt their development.

Nonetheless, not all children of immigrants perform poorly. Many achieve equally as well as, if not better than, children of native families, even when attending schools with inadequate resources and multiple risk factors. One of the most promising themes elicited from the literature on children of immigrants is that they can and often do achieve in school despite the odds, especially when they are supported by strong sociocultural contexts consisting of community, school, and family support. For example, one the one hand, Latinas face educational disparities that are strongly linked to poverty, poor quality schools, family responsibilities, limited neighborhood resources, and tracking in low-level classes (Zambrana & Zoppi, 2002). Alarmingly, Latinas have the highest high school dropout rate among all racial and ethnic groups. On the other hand, they also possess cultural wealth such as values and norms that guide their behavior and may contribute to their resiliency (e.g., a cultural emphasis on religious faith, collective orientation, showing affection towards young children, and a high value placed on responsibility to others, respect for elders, and polite and helpful behavior). Although a fundamental improvement in socioeconomic status has been found to be a necessary prerequisite for lasting educational success for Latinas (Zambrana & Zoppi, 2002), there are also concrete steps that schools may take to facilitate the process of turning their cultural wealth into social capital that may be utilized for academic success. One such strategy may be to provide a link between families and schools through the promotion of parental communication and intergenerational programs such as ESL classes.

In addition, the literature suggests that education is a process formed by a series of trajectories and pathways that are influenced by numerous factors and ultimately shape the unique individual and group outcomes of immigrants. Because these trajectories start early in life and are ultimately formed or neglected during this time, it is necessary for educators and policymakers to recognize the critical importance of early childhood learning for cognitive growth, socialization, and the development of a positive orientation towards learning and educational opportunity structures.

All of this points to the continually pressing importance of examining the academic

achievements and socioemotional development of children of immigrants in a school context. Despite a large body of research demonstrating the importance of early school experiences to later success (Ripple et al., 1999; Shonkoff & Phillips, 2000), most of the existing scholarship on immigrants has focused on immigrant adolescents instead of young children. Moreover, the majority of existing studies on immigrants have used a cross-sectional approach, which has made it difficult to understand the time-dependent effects of a variety of factors that are important to the experiences of children of immigrants.

Taken together, we know from research on both child development and adolescent immigrants that students' academic and socioemotional development is fostered in an ecological context, mainly because children's learning is heavily influenced not only by culturally guided family practices and interactions, but also by surrounding environments (e.g., schools) that shape how and what they learn every day. We also know that the early school years constitute a critical period to children's later academic and socioemotional well-being. Previous research on adolescent immigrants has also shown the benefits of being bilingual to academic achievement. What we do not yet know is how bilingualism factors into children's academic and socioemotional developmental trajectories during their early school years and how the school environment influences these developmental processes. This study fills this knowledge gap.

Data

The ECLS-K, collected by the U.S. Department of Education's National Center for Educational Statistics, consists of longitudinal data on a nationally representative cohort of children who entered kindergarten in the fall of 1998. Children were drawn randomly via a multistage probability design from a nationally representative sample of roughly 1,000 U.S. public and private schools that have either a full- or part-day kindergarten program, with an average of more than 20 children per school. Thus, a national probability sample of 21,260 children in about 800 public and 200 private schools was assessed at entry to kindergarten in Fall 1998. As of this writing, the publicly released data were available from

kindergarten to fifth grade, with a total of 11,820 children responding to the survey at fifth grade. The sample consists of children from different racial/ethnic and socioeconomic backgrounds and includes an oversample of Asian children. Thus, the sample is able to support separate estimates for Hispanic and Asian children from a variety of immigrant groups.

The ECLS-K collected detailed information on the child's language proficiency upon school entry and the language spoken between the parent and child at home, which makes the ECLS-K the one and only national dataset with the capacity to evaluate the relationship between children's language abilities during their early school years and their developmental trajectories.

To restrict the analysis only to children from Latin-American and Asian backgrounds, 4,158 children with family roots in other regions or who identified themselves as non-Hispanic Black, multiracial, or of an unlisted race/ethnicity were excluded, as were children of immigrants from South Central/Western Asia for whom no significant results were found. The present sample thus consists of children in the ECLS-K who had information on their home language, resulting in a study sample of 16,376 children. Of these, 58% are non-Hispanic White, 14% of the children speak a non-English language at home, and about half of the children are males.

It is worth noting that about 9% of children in the ECLS-K were not administered a direct reading assessment in the fall of kindergarten due to limited English proficiency; this percentage dropped to 2% by the end of first grade because most students could take the test in English. By third grade, every student was assessed in English. All English- and Spanish-speaking students were administered the math assessment in all grades regardless of their language ability. Growth curve modeling used in this analysis handles such unbalanced data well, as students did not have to be assessed at all data points to be included in the analysis (Singer & Willett, 2003). Nevertheless, the missing data on some children at kindergarten, and the fact that missing data were particularly likely for Mexican children, is a limitation that calls for cautious interpretations of the results. However, the ELL data offer a fortuitous strength, as

they provide the necessary information to identify children's language abilities for the analyses.

Multiple imputation (with STATA's "ice" command) was utilized to handle missing data (including outcome variables) with five imputed datasets. Rates of missing data were less than 1% for the demographic, family, and home-environment variables measured in the fall of kindergarten, 3% for the spring of kindergarten, and 4% for the spring of first, third, and fifth grade. Rates of missing data were higher for school factors, but generally below 20%. The multilevel structure of the ECLS-K data was preserved in the multiple imputation procedure by assigning the same imputed values for school variables to students from the same school.

This study uses direct assessments of children's reading and math achievement as well as teachers' reports of socioemotional well-being in the fall and spring of kindergarten and the spring of first, third, and fifth grade. In addition, the study also considers data gathered from parents on family characteristics and parental involvement in home learning and school activities, from teachers and school administrators on school characteristics, and from supervisors' observational ratings of the school environment. At each interview, computer-assisted telephone interviews were used to collect family background information from the parent, who in most cases was the child's mother and the rest of the time was another live-in adult who was knowledgeable about the child's schooling. About 6% of the parent interviews were conducted in a non-English language, which was Spanish 94% of the time.

Teachers and administrators completed self-administered surveys that were distributed and collected by field supervisors. At each data point, teachers provided information on individual students and classes and their own demographic and training backgrounds, teaching attitudes, and classroom practices. In the spring of each survey year, school administrators, principals, or headmasters reported on their own background and training and the school's student body, policies and practices, and physical, organizational, fiscal, and learning environments.

Measures

Academic Performance

Language use and literacy (in the reading assessment) and mathematics were assessed at all interview points in the ECLS-K. The reading assessment includes questions designed to measure basic skills (e.g., letter and word recognition), receptive vocabulary, and comprehension (listening to and understanding words in context). The mathematics assessment measures skills in conceptual and procedural knowledge and problem solving. The reliability of the assessments is high, ranging from 0.88 to 0.97 from kindergarten to fifth grade (hereafter, K to 5).

Direct assessments of reading and mathematics competence were collected in one-on-one testing sessions using an item response theory (IRT) approach. A brief language screening (the Oral Language Developmental Scale, OLDS) was given in the fall of kindergarten to 15% of children who were identified by teachers or school records as having a non-English language background. Approximately 59% or 1,363 of these children (9% of the overall sample) scored below the cut-off point and were given only the mathematics and psychomotor assessments that year. By first grade this number was down to 344, with 85% of these children's families originating from Mexico, 10% from other Latin American countries, and 5% from Asian countries. In third grade the OLDS was not administered, and all children were assessed in English (see Table 1).[1] As discussed earlier, the scores for children who were not assessed were imputed with multiple imputation.

Standardized *t* tests (*M* = 50, *SD* = 10) were used to examine reading and math outcomes via a transformed measure of the Item Response Theory (IRT) scale score. This norm-referenced score represents children's abilities relative to their average peers nationwide (i.e., children who entered

[1] The raw data suggest that, among immigrants, children who did not pass the OLDS by first grade had different attributes (e.g., more likely to speak a non-English language at home, to have more children under 18 and more adults over 18 at home, to be poorer and have a lower SES, to be less likely to attend center-based care before kindergarten, and to have mothers who were younger and less educated) than those who either passed the OLDS or who were proficient in English at the start of kindergarten. However, in an ECLS-K report (Denton & West, 2002), no significant reading *t*-score differences were found between the children who were assessed in English at all time points and the total sample, including those who were screened into the English assessment over time.

kindergarten in Fall 1998), and a change in mean *t* scores over time reflects a change in relative ability, which is the focus of this paper.

Social and Emotional Development

The socioemotional assessment draws teacher-reported data from the Social Rating Scale (Gresham & Elliott, 1990) and focuses on the skills and behaviors that contribute to social competence. These skills include social skills (e.g., cooperation, assertion, responsibility, and self-control) and problem behaviors (e.g., impulsive reactions, verbal and physical aggression) as measured through five scales. Approaches to learning, self-control, and interpersonal skills were rated on a scale of 1 (never) to 4 (very often). The approaches to learning scale includes six items that rate how often a child shows eagerness to learn, interest in a variety of things, creativity, persistence, concentration, and responsibility. The self-control scale consists of five items that indicate children's ability to control their behavior, such as the frequency with which a child fights, argues, or gets angry. The interpersonal skills scale has five items that rate the child's skills in forming and maintaining friendships; getting along with people who are different; comforting or helping other children; expressing feelings, ideas, and opinions in positive ways; and showing sensitivity to the feelings of others. In addition, externalizing problem behaviors (e.g., acting out) and internalizing problem behaviors (concerning the apparent presence of anxiety, loneliness, low self-esteem, and sadness), as reported by teachers, were also used. These scales have high split-half reliabilities, ranging from 0.50 to 0.90.

Because these scales were reported by teachers in each grade, an increasing or decreasing trend in any of these socioemotional outcomes could very well be the result of teachers' reporting bias instead of true upward or downward trends from K to 5. However, examining the data closely, the standard errors of each of the five measures were relatively stable over time for the whole group as well as within the subgroups (e.g., by language, country of origin, race/ethnicity). This gives the research some confidence that the issue may not be as serious as expected. To at least partially address this problem, a

standardized *Z* score with a mean of zero and standard deviation of 1 was computed for each of the five socioemotional outcomes to be used in analysis. Despite this, cautious interpretations of the analysis are warranted given the subjective nature of these socioemotional outcomes.

Language Exposure

Children's language exposure was measured by the combination of the language they spoke at home and their English proficiency as measured at school entry.

With respect to the language spoken at home, the ECLS-K collected detailed information in the fall of kindergarten on four directions of language interaction between the parents and child: mother's language spoken to child, father's language spoken to child, child's language spoken to mother, and child's language spoken to father. Each of these four interaction pairs consists of four possible language use patterns: never speaks the native language (or always speaks English), sometimes speaks the native language, often speaks the native language, and very often speaks the native language. Details on the spoken language between the parent and the child are provided in Table 2.

The second part of the determination of children's language exposure comes from their English proficiency at school entry, as determined by whether or not they were administered and passed the OLDS test. This measure of English proficiency is combined with children's language use at home with the mother[2] to create five dummy variables that represent children's language exposure as detailed in Table 3: English Monolinguals, English-dominant Bilinguals, Fluent Bilinguals, Non-English-dominant Bilinguals, and Non-English Monolinguals (did not pass the OLDS by the end of first grade).

Immigrant Generation Status and Race/Ethnicity

The mother was asked in the spring of first grade and the father in the fifth grade to report whether s/he was born in the US. In the spring of kindergarten, the parent was asked whether the child

[2] Approximately 90% of the father-child dyads had the same spoken language pattern as the mother-child dyads. In all of the analyses, a set of dummy variables were included to represent whether the mother-child and father-child dyads had the same spoken language pattern at home language (the reference group), the mother-child dyad used more English, or the father-child dyad used more English.

was born in the US. If either the parent or the child was born outside the US, the parent was also asked to report the country from which s/he came. These questions were used to identify a family's immigrant status (coded as immigrant for children who had at least one foreign-born parent) and whether the child was a first-generation (child not born in the US with at least one foreign-born parent) or second-generation immigrant (child born in the US with at least one foreign-born parent). Children's country of origin was categorized both by single countries and by grouping countries with similar cultures or refugee histories (for a detailed methodology, see Portes & Rumbaut, 2006). Ten Latin American countries, Spanish-speaking Caribbean countries (hereafter, Latin America is used to represent both Latin American and Spanish-speaking Caribbean countries for simplicity), and Asian regions were categorized: Puerto Rico[3], Central America (e.g., Costa Rica, El Salvador), South America (e.g., Argentina, Brazil), the Dominican Republic, Mexico, Cuba, East Asia (e.g., China, Japan, Korea), Vietnam/Thailand/Cambodia/Laos, other Southeast Asia (e.g., Indonesia, Malaysia, Philippines), and India. Details on the distribution of country of origin by five language groups are provided in Table 4. Approximately 12% of the study sample children were identified as either first- (2%) or second-generation (10%) children of immigrants originating from either Latin American or Asian regions (another 4% were from regions other than those to be examined in this study and therefore were excluded from the analyses). Over 60% of the first-generation children originated from Latin American regions, with the majority originating from Mexico. Approximately 65% of second-generation children had parents who came originally from Latin America, with half originating from Mexico.

For third- and later generation children (both child and parent born in the US), race/ethnicity was identified by three groups: non-Hispanic White, Hispanic, and Asian. Non-Hispanic Whites occupied two thirds of the total current analyzed sample.

[3] Although children from Puerto Rico are U.S. citizens, this paper acknowledges the important geographical and cultural differences between children from Puerto Rico and those born in the US and thus will separate them in the analyses.

ESL Instruction and Services

The ECLS-K collects some information regarding ESL instructional practices that are relevant to ELL students and that are offered through the classroom and larger school settings. The ECLS-K defines ESL as an instructional program designed to teach listening, speaking, reading, and writing English language skills to ELL children. The ECLS-K defines a bilingual education program as one in which the students' native language is used in varying degrees to instruct ELL children. Unless otherwise noted, each of the following variables was collected from K to 5. The following four measures were used to capture ESL instruction and services and are detailed in Appendix Table 1: (a) the amount of ESL instruction per week (including frequency and time spent, and the percentage of students receiving pull-out or in-class ESL instruction), available from K to 3; (b) the number of Title-I-related services provided by the school; (c) teachers and school administrators' ESL/Bilingual related experience; and (d) the number of services/programs provided to ESL families by the school.

The covariates examined in this analysis are described briefly below and are detailed in Appendix Table 1. In addition, details on the distribution of the descriptive statistics of these covariates by five language groups and racial/ethnic groups are provided in Appendix Table 2.

Larger School Settings

A total of 10 variables were examined to evaluate the school environment. They include school resources (i.e., type of school and poor/minority student composition), student learning environment (i.e., academic standards too low, school stability, observed learning environment, average student academic performance, and teacher's effort), school support and teaching environment, school work climate, and school physical resources. Appendix Table 1 provides details about these variables.

Child and Family Characteristics

Time-invariant variables collected in the fall of kindergarten included child's gender, birth weight, attendance in center-based care before kindergarten, parental marital status at birth, and

parental education (from either mother or father, whichever was higher). Time-variant variables were collected at all interview points and included the presence of siblings in the household, the number of people under age 18 in the household, living in a single-parent family, family SES (calculated from family income, parental education, and occupation), parental educational expectations, home environment, parental school involvement, region (e.g., northeast) and location (i.e., city, suburban, or rural) of residence.

Methods

Three-level growth curve modeling was used to estimate the associations between language status and children's academic trajectories. Analyses were estimated with Level 1 as time (i.e., within-individual effects), Level 2 as individuals (i.e., between-individual and within-school effects), and Level 3 as schools (i.e., between-school effects). With longitudinal data involving five assessment points, children's developmental *trajectories* (growth/decay curves) were estimated to compare the rate of growth of each group to see which have faster or slower growth curve over time. Three-level growth curve models also partition the outcome variance into between- and within-school portions, allowing for the most accurate estimation possible of school-level effects on individual-level outcomes and more accurate standard error estimates to account for students being nested within schools (Hox, 2002).

As recommended in the longitudinal data analysis literature (Singer & Willett, 2003), a sequence of statistical models was used to systematically evaluate (a) whether there were differences in the academic trajectories of children due to language status, and if so, (b) to what extent school-level factors were able to explain these variations. Typically, the first two models presented in a growth curve analysis are the unconditional means model and the unconditional growth model. The first of these models quantifies variation in outcomes across children and schools without regard to time in order to assess the amount of variation that exists at the within- and between-person and within- and between-school levels. The second of these models includes only a variable for time and allows us to determine

the extent to which within-person and within-school variation is systematically associated with time. Additionally, the amount of between-person and between-school variation present in this model tells us whether or not to add explanatory variables in order to explain such variation. Thus, these two models allow us to establish (a) whether there is systematic variation in the outcomes that is worth exploring, and (b) where that variation resides (within or between children or schools).

For brevity's sake, the results of these first two models are not presented, although they are described briefly in the results section. They are followed by three successively complex models. The first, Model 1, builds on the unconditional growth model by adding controls for language groups and the interaction between these groups and time (so that the growth rate of each group is allowed to differ). The next model further adds controls for child and family characteristics. Finally, the last model (Model 2) adds controls for school-level factors and their interaction with time (so that the effects of school-level factors are allowed to differ by time) to determine the associations between school characteristics and the outcome variables net of other important factors. The presentation focuses on Models 1 and 2 as specified above, which explore the main themes of the paper.

All continuous variables were centered at their grand mean values, except the dummy variables (e.g., attending public school), so that the reference child represents a realistic scenario (Singer & Willett, 2003). In addition, the variable "time" was centered so that the initial status would refer to the fall of kindergarten, which is the true starting point in this case.[4] All of the analyses were conducted separately for Latino and Asian groups so that models on samples of first-and second-generation children of Latino origin and native-born Hispanics would include all of these children in addition to native-born, non-Hispanic White children. Similarly, the models on the samples of first- and second-generation children of

[4] For example, in models with controls for language groups and school-level factors, the reference child would be a native-born White girl (boy = 1, girl = 0) of English Monolingual background who attended a private school (public = 1, private = 0) with average levels of ESL instructional practices, teachers' and administrators' ESL-related experience, Title I services, services for ESL families, poor/minority student composition, student learning environment, student academic performance, teacher's effort, school support and teaching environments, school work climate, and school physical resources in the fall of kindergarten.

Asian origin and native-born Asian children include all of these children in addition to native-born, non-Hispanic White children. Separate analyses by Latino and Asian groups allow the estimates for language exposure and school-level factors to differ across groups. This is particularly important given these two groups tend to exhibit generally different academic performance.

Results

Appendix Table 2 presents sample characteristics by language groups. Panel A presents the data on native-born, non-Hispanic Whites (hereafter, White), Panel B presents the data on the native-born Hispanics (hereafter, Latinos) and first- and second-generation children of Latino origins, and Panel C presents the data on the native-born Asians (hereafter, Asians) and first- and second-generation children of Asian origins. In general, compared to White children, Latino children tended to be the worst off, and Asian children tended to be in the middle, both according to the number of sociodemographic variables and in their parents' involvement in their schooling. Notably, Latino and Asian children tended to have parents who held higher educational expectations for their children. Regarding school characteristics, Latino and Asian children were more likely than White children to attend schools that were public or that had a higher composition of poor/minority students, lower average academic performance, a poorer student learning environment, less school support for teachers and poorer teaching environments, poorer work environments, and shoddier physical resources. However, these children were also more likely to attend schools with more ESL programs and related services for their families.

Appendix Table 2 also highlights the heterogeneity within racial/ethnic groups. Among Latino children, English Monolinguals and to a lesser extent English-dominant Bilinguals and Fluent Bilinguals were better off than Latinos who spoke less English on a number of socio-demographic variables, their parents' involvement in their schooling, and school characteristics. In the Asian group, non-English Monolingual children had the most disadvantaged characteristics. Non-English Monolingual children

were more likely to be of Thai/Vietnamese/Cambodian/Laotian, Central American, Dominican, or Mexican descent (see Table 4).

Appendix Tables 3–9 present children's two academic T scores and five socioemotional raw scores, respectively, by children's racial/ethnic membership as well as language exposure. English-dominant Bilingual and Fluent Bilingual children in the Latino group experienced the largest positive change in their reading scores from K to 5. Whereas White children seemed to lose ground on their math scores from K to 5, the majority of Latino and Asian children were making gains during this period. Although all groups of Latino and Asian children were more likely than White children to make noteworthy gains in their socioemotional outcomes, Fluent Bilingual, non-English-dominant Bilingual, and Non-English Monolingual children in both the Latino and Asian groups experienced the largest positive changes in their approaches to learning, self-control, and interpersonal skills. On the contrary, Latino and Asian children were improving on their externalizing and internalizing problems by showing less increasing or even decreasing trends in these two problem behaviors compared to White children, who were actually reported to have more externalizing and internalizing behaviors by their teachers.

Correlations among school-level predictors for the spring of fifth grade and the academic and socioemotional outcome variables at each time point are presented in Appendix Tables 10 and 11, respectively. As is evident in these tables, there was a general baseline relationship between academic and socioemotional outcomes and school-level factors (this relationship was also apparent when using school-level variables from kindergarten, first, and third grade).

The multilevel results below assess children's academic and socioemotional trajectories from K to 5. Models 1 and 2 are presented for each of the growth-curve analyses. Tables 5 and 6 present the academic and socioemotional results for the Latino group, respectively. Tables 7 and 8 present the academic and socioemotional results for Asian group, respectively. Because the focus of this paper is on school-level factors, the estimates for child and family characteristics were not presented to preserve

space.

Reading Results for Latino Children

The results for children's reading trajectories from K to 5 from both the unconditional means and unconditional growth models (results not shown) indicated that the average child's reading trajectory was 50.42 ($p < .001$) and had a strong positive slope of .21 ($p < .001$), revealing that reading scores increased through grades. Also, the average child's reading scores varied significantly over time, with approximately half of the variation in reading scores attributable to differences among children and 22% attributable to differences among schools.

Model 1 of Table 5 (the left columns) expanded on the unconditional growth model by adding children's language exposure as a predictor of both initial status and change. This model provides *uncontrolled* answers to whether or not children's language ability makes a difference in their reading trajectories. The coefficient estimates indicate that (a) the reading score for the average English Monolingual child was 51.53 ($p < .001$); (b) children with other levels of language exposure had significantly lower reading scores compared to English Monolingual children; (c) the average growth rate in reading scores for the average English Monolingual child was significantly increasing (b = 0.22, $p < .001$); and (d) Non-English Monolingual children's reading scores were increasing more slowly compared to English Monolingual children.

Model 2 of Table 5 (the left columns) evaluates the associations of children's language exposure with their reading trajectories while controlling for the effects of school-level and child and family characteristics. The results show that (a) the differentials in reading scores between English Monolinguals and all other language groups declined from 23% (for the English-dominant Bilinguals) to 51% (for Fluent Bilinguals) and (b) the differentials in the growth rates between English Monolingual children and English-dominant Bilingual and Fluent Bilingual children became significantly positive. English-dominant Bilingual and Fluent Bilingual children now had faster increasing rates in their reading

scores than their English Monolingual peers. Though the results from Model 1 are valid, Model 2 provides *controlled* answers to the research question. The decreased magnitudes in reading score differences in this model indicate that some of the differences between English Monolinguals and the other language groups may be attributable to school-level factors. Specifically, comparing the magnitudes of the estimates of the model controlling only for child and family characteristics (results not shown) with Model 2, at least one third of the drop in the magnitude of the estimates in Model 2 was due to adding controls for school-level factors. In particular, the type of school, school student composition, school services for ESL families, student learning environment, student academic performance, supportive and teaching environments, and school work climate were all significantly associated with students' average reading scores. Children in public schools, more ESL instruction, higher teacher effort, or better physical resources increased their reading scores faster than their peers in counterpart schools. However, children in schools with teachers and principals with more ESL experience and higher student academic performance increased their reading scores more slowly than their peers in other schools. For example, the average Fluent Bilingual child had a fitted trajectory with an intercept of 51.55 and a slope of 0.31 (0.12 + 0.19), whereas for the average English Monolingual child the figures were 52.49 and 0.12, respectively. By fifth grade, the reading scores were 53.26 for the former and 53.15 for the latter, a 100% reduction in the difference after controlling for school-level and child and family characteristics.

As seen in Table 5, within person variance remained similar across all models, which was to be expected as only a few time-varying Level-1 predictors were added. Also, the variance components in Models 1 and 2 were all lower than the unconditional growth model. Taken together in Model 2, language exposure, school-level factors, and child and family characteristics explained 24% of the variation in between-person initial status, 6% of the variation in between-person rates of change, 82% of the variation in between-school initial status, and 5% of the variation in between-school rates of change.

To evaluate the fit of each model presented in Table 5 (left two columns), three goodness-of-fit indices were used (Singer & Willett, 2003) as shown at the bottom of the table: the deviance statistic, the Akaike Information Criterion (AIC), and the Bayesian Information Criterion (BIC). For each successive model, the decrease in the deviance statistic was significant at $p < .001$, indicating that Model 2 provided the best fit of all the models. The comparisons between models using the AIC and BIC were similar (the model with the smaller value is preferable).

Math Results for Latino Children

Similar to the results for the reading models, the results from the unconditional means model and the unconditional growth model indicated that the average child's math score was 50.83 ($p < .001$) with a strong positive slope of 0.07 ($p < .01$), indicating that math scores increased through all grades. Also, the average child's math score varied significantly over time, with about half of the variation in math scores attributable to differences among children and 21% to differences among schools.

Model 1 of Table 5 (the right columns) expanded on the unconditional growth model by adding children's language exposure as a predictor of both initial status and change. The coefficient estimates indicate that the math score for the average English Monolingual child was 52.58 ($p < .001$) and the growth rate of change was a nonsignificant -0.03. In contrast, all other language groups had significantly lower math scores at kindergarten entry compared to English Monolingual children, but their math trajectories were significantly faster than the rate of change for English Monolingual children.

Model 2 of Table 5 (the right columns) evaluates the associations of children's language exposure with math scores while controlling for the effects of school-level and child and family characteristics. The results indicate that (a) the differentials in math scores between English Monolinguals and all other language groups declined from 27% (for the non-English-dominant Bilinguals) to 49% (for Fluent Bilinguals) and (b) the significant differences in the rates of change in Model 1 became larger and remained significant. As with the reading models, the decreased magnitudes suggest

the influence of school-level factors. Specifically, comparing the magnitudes of the estimates from the child and family model (results not shown) with Model 2, approximately one third of the drop in the magnitude of the estimates in Model 2 was attributable to adding controls for school-level factors. In particular, the type of school, concentration of poor/minority students, student learning environment, student academic performance, teacher's effort, school supportive and teaching environment, and physical resources were all significantly associated with children's average math scores. Children in public schools, schools with more services for ESL families, lower student academic performance, higher teacher's effort, and more school physical resources increased their math scores faster from K to 5. For example, the average Fluent Bilingual child had a fitted trajectory with an intercept of 50.05 and a slope of -0.13 (-0.52+0.39), while for the average English Monolingual child the figures were 51.31 and -0.52, respectively. By fifth grade, the math scores were 49.34 for the former and 48.45 for the latter, a 100% reduction in the difference after controlling for school-level factors and child and family characteristics.

Just as with the reading models, there was not much of a reduction in within-person variance across models due to the lack of time-varying Level-1 predictors. In each model, variances in initial status and rates of change at Level 2 were lower when compared to the unconditional growth model. In Model 2, language exposure, school-level factors, and child and family characteristics jointly explained 23% of the variation in between-person initial status, 5% of the variation in between-person rates of change, 86% of the variation in between-school initial status, and 36% of the variation in between-school rates of change.

The three goodness-of-fit indices presented at the bottom of the right-hand columns of Table 5 (the deviance statistic, AIC, and BIC) indicate that each subsequent model provided a better fit than the previous model. Model 2 thus provided the best fit of all.

Figures 1.1 and 1.2 present the reading and math trajectories, respectively, from K to 5 for Latino children based on Model 2 of Table 5. It is clear that English-dominant Bilingual and Fluent

Bilingual children were surpassing English Monolingual children by fifth grade for both reading and math scores despite having scored lower at kindergarten entry. In contrast, non-English-dominant Bilingual children started kindergarten with significantly lower reading and math scores, and thus they were still lagging behind on their reading scores by fifth grade, but their significantly faster increasing rate of math scores allowed them to narrow the academic gap with their native-born White English Monolingual peers. Non-English Monolingual children, however, not only had significantly lower reading and math scores at kindergarten entry, but also a downward academic trajectory from K to 5 that even further widened the academic gap with their native-born White English Monolingual peers.

Socioemotional Results for Latino Children

Table 6 reports the estimates from the growth curve analysis on the five socioemotional outcomes—approaches to learning, self-control, interpersonal, externalizing, and internalizing behavior using the same table structure as shown in Table 5. Because *Z* scores were used, the estimates were small, and thus three decimal points were presented instead of two in the tables. For brevity's sake, the discussion below focuses on Model 2.

With respect to the results on approaches to learning, the results from the unconditional growth model indicate that the average child's score varied significantly over time, with approximately 39% of the variation attributable to differences within individual children, 52% to differences among children, and 10% to differences among schools. Results in Model 2 indicate that, compared to English Monolingual children, Fluent Bilingual children had significant higher scores on this outcome at kindergarten entry. In addition, whereas the growth rate for English Monolingual children was nonsignificant (neither increasing nor decreasing), Fluent Bilingual, non-English-dominant Bilingual, and non-English Monolingual children all increased their approach-to-learning skills faster from K to 5; even though non-English Monolingual children had significantly lower average scores at kindergarten entry. Children in public schools, schools with higher student academic performance, and better supportive

and teaching environments had significantly higher average scores, but children in schools with more teacher's effort, better work climate for teachers, and better physical facilities had significantly lower average scores. With regards to growth curve, children in schools with higher school stability, higher teacher's effort, and better physical facilities increased their approach–to-learning skills at a faster rate, whereas those in schools providing more instructional ESL classes and more Title I services increased their approach-to-learning skills more slowly.

Regarding the results on self-control, the findings from the unconditional growth model indicate that the average child's self-control scores varied significantly over time, with approximately half of the variation attributable to differences within individuals, 42% to differences between children, and 11% to differences among schools. The results from Model 2 indicate that no significant differences in the average scores at kindergarten entry were observed between English Monolingual children and their peers with different language exposure. In contrast, although English Monolingual children were rated by teachers as having significantly increased their self-control skills from K to 5, non-English-dominant Bilingual children had an even faster increasing rate. Children in public schools, schools with higher student academic performance, teachers considering that the school's academic standards were too low, and better supportive and teaching environments were rated to have significantly higher average scores on self-control. However, children in schools with teachers and principals having more ESL experience, higher school stability, higher teacher's effort, and better physical facilities had teachers who rated them as having significantly lower average level of self-control skills. Notably, with regards to growth curve, children in schools with higher school stability and better physical facilities had teachers who described them as increasing their self-control skills significantly more quickly, whereas children in schools with higher student minority composition and more instructional ESL classes and Title I services had teachers who described them as increasing their self-control skills significantly more slowly than their peers in counterpart schools.

With respect to the results on interpersonal skills, the findings from the unconditional growth model indicate that the average child's interpersonal skills varied significantly over time, with approximately half of the variation attributable to differences within individual children, 38% to differences between children, and 12% to differences among schools. The results from Model 2 indicate that although non-English-dominant Bilingual children and non-English Monolingual children had significantly lower scores on teachers' ratings of interpersonal skills compared to English Monolingual children, teachers reported that the former groups increased their interpersonal skills significantly faster from K to 5. Fluent Bilingual children also increased their interpersonal skills significantly faster from K to 5 compared to that of English Monolingual children. Children in public schools, schools with more ESL instructional classes, teachers considering that the school's academic standards were too low, lower school stability, and better supportive and teaching environments had significantly better interpersonal skills than their respective counterparts. In addition, with respect to growth curve, children in schools with higher stability, better physical facilities, and teachers who considered that the academic standards were good enough were rated by their teachers as having increased their interpersonal skills significantly faster. In contrast, children in schools with more ESL instructional classes and Title I services were reported by their teachers as having increased their interpersonal skills significantly more slowly from K to 5 compared to children in other schools.

For the results on internalizing behavior problems, the findings from the unconditional growth model indicate that the average child's internalizing behavior problems varied significantly over time, with approximately 58% of the variation attributable to differences within individual children, 33% to differences between children, and 8% to differences among schools. The results from Model 2 indicate that Fluent Bilingual children not only had significantly fewer internalizing behavior problems at kindergarten entry compared to English Monolingual children, but also they had teachers describe them as having a slower rate of increase for internalizing behavior problems from K to 5. In contrast, English

Monolingual children had significantly faster increasing rates of internalizing behavior problems from K to 5. Children in public schools, schools with better supportive and teaching environments (but lower teacher's effort) had significantly lower average internalizing behavior problems compared to their respective counterparts. Children in schools with better supportive and teaching environments but that provided less Title I services had teachers describe them as having a significantly slower increasing rate of internalizing behaviors from K to 5 than schools with weaker teaching environments but more Title I services.

In regard to externalizing behaviors, the results from the unconditional growth model indicate that the average child's externalizing behaviors varied significantly over time, with approximately 35% of the variation attributable to differences within individual children, 59% to differences between children, and 6% to differences among schools. The results from Model 2 indicate that whereas Fluent Bilingual children and non-English-dominant Bilingual children had significantly lower average level of externalizing behavior problems at kindergarten entry, only the latter group had significantly slower increasing rates of externalizing behavior problems from K to 5 compared to English Monolingual children who had teachers describe them as having significantly increased their externalizing problems from K to 5. Children in public schools, schools with higher student academic performance, and schools with better supportive and teaching environments had significantly lower externalizing problems, whereas children in schools providing more Title I services, that had teachers and principals with more ESL experience, and that had higher teacher's effort were described by their teachers as having significantly higher externalizing behavior problems. With respect to growth curve, children in public schools with poorer supportive and teaching environments and work climates (but better physical facilities) were described by their teachers as having a faster increasing rate of externalizing problems from K to 5 compared to their peers in the opposite school environment.

Just as with the reading and math models, there was not much of a reduction in within-person variance across models due to the lack of time-varying, Level-1 predictors. In each model, the variances in initial status and rates of change at Levels 2 and 3 were lower when compared to the unconditional growth model. In Model 2, language exposure, school-level factors, and child and family characteristics jointly explained 20% (approach to learning), 16% (self-control), 15% (interpersonal skills), 14% (externalizing problems), and 8% (internalizing problems) of the variation in between-person initial status. For the variation in between-person rates of change, 8% was explained for approach to learning, 5% for self-control, 10% for interpersonal skills, and 2% for externalizing and internalizing problems. For the variation in between-school initial status, the corresponding numbers are: 20% (approach to learning), 16% (self-control), 15% (interpersonal skills), 14% (externalizing problems), and 6% (internalizing problems). Finally, for the variation in between-school rates of change, 8% was explained for approach to learning, 5% for self-control, 10% for interpersonal skills, and 2% for externalizing and internalizing problems.

The three goodness-of-fit indices presented at the bottom of Table 6 (the deviance statistic, AIC, and BIC) indicate that each subsequent model provided a better fit than the previous model. Therefore, Model 2 provided the best fit of all.

Figures 2.1 to 2.5 present the socioemotional trajectories from K to 5 based on Model 2 of Table 6 for Latino children. It is clear that non-English-dominant Bilingual and Fluent Bilingual children were doing very well on all five socioemotional well-being. Their approaches to learning, self-control, and interpersonal skills increased at a faster rate, which allowed them to surpass every other group by fifth grade. Additionally, these two groups had the lowest levels of internalizing and externalizing behavior problems by fifth grade, or at least they had teachers from each grade who reported them as having fewer behavior problems over time. English-dominant Bilingual children had similar socioemotional trajectories to English Monolingual children, with the exception that English-dominant Bilingual children

had the highest level of externalizing behavior problems of all groups by fifth grade. Non-English Monolingual children increased their approach-to-learning skills significantly faster than English Monolingual children, and thus the former group had higher approach-to-learning skills by fifth grade. However, their self-control and interpersonal skills were still rated the lowest of all groups by fifth grade even though they had an increasing growth curve. Alarmingly, non-English Monolingual children had the highest level of internalizing behavior problems at kindergarten entry, and this was still the case by fifth grade.

Results for Asian Children

Table 7 presents the results on academic outcomes and Table 8 presents the results on socioemotional outcomes for children of Asian origin and native-born Asians. The results for both reading and math scores for Asian children were very similar to those presented for Latino children, with a few exceptions. For example, Asian children in schools with higher concentrations of poor/minority students increased their reading scores significantly slower from K to 5, but this was not the case for the Latino group. Overall, language exposure, school-level factors, and child and family characteristics jointly explained 23% of the variation in between-person initial status, 5% of the variation in between-person rates of change, 78% of the variation in between-school initial status, and 9% of the variation in between-school rates of change for the Asian children's reading scores. The corresponding numbers for math were 22%, 5%, 84%, and 38%, respectively.

Figures 3.1 and 3.2 present the reading and math trajectories based on Models 2 of Table 7 for Asian children. Although English Monolingual children had the highest reading and math scores from kindergarten entry to fifth grade, English-dominant Bilingual and Fluent Bilingual children were closing the gaps, and Fluent Bilingual children even performed as well as English Monolingual children on math outcomes by fifth grade. Non-English-dominant Bilingual children had significantly lower reading and math scores at kindergarten entry and their reading trajectories did not allow them to narrow the gap,

although they were able to close some of the gap with their White English Monolingual peers in terms of math scores. Non-English Monolingual children were lagging behind at kindergarten entry and this was even truer by fifth grade.

The findings on socioemotional outcomes are shown in Table 8. The results from the unconditional growth models indicate that the average child's socioemotional outcomes varied significantly over time. Approximately 52% of the variation in approach–to-learning skills were attributable to differences among children and 9% were attributable to differences among schools; 42% and 12% of the variation in self-control skills were attributable to differences among children and among schools, respectively; 38% and 13% of the variation in interpersonal skills were attributable to differences among children and among schools, respectively; 34% and 9% of the variation in internalizing behaviors were attributable to differences among children and among schools, respectively, and; 60% and 6% of the variation in externalizing behaviors were attributable to differences among children and among schools, respectively.

The results from Model 2 indicate that, with English Monolingual children as the comparison group, English-dominant Bilingual children had significantly lower approach-to-learning skills as reported by teachers at kindergarten entry, but their teachers described them as increasing their approach-to-learning skills faster from K to 5. Although English-dominant Bilingual children did not have significantly different average self-control skills as they advanced from K to 5, their teachers did say that they increased their self-control skills significantly faster from K to 5 than English Monolingual children. Fluent Bilingual children had significantly lower average interpersonal skills at kindergarten entry but had teachers describe them as increasing their interpersonal skills significantly faster from K to 5. Non-English-dominant Bilingual and non-English Monolingual children had significantly lower average scores on approaches to learning, self-control, and interpersonal skills compared to English Monolingual children, but only non-English-dominant Bilingual children had teachers report them as improving on all

of these three skills at a significantly faster rate than White English Monolinguals from K to 5. Non-English-dominant Bilingual children also had teachers report them as significantly decreasing their externalizing behavior problems compared to White English Monolingual children, who had significantly increasing rates of externalizing behavior problems from K to 5.

Children in schools with better supportive and teaching environments had significantly higher average scores on approaches to learning, self-control, and interpersonal skills and lower average scores on internalizing and externalizing behaviors from K to 5. All of the other school-level factors were important to children's average socioemotional scores from K to 5, except student learning environment and school work climate for teachers. Importantly, there were a number of school-level factors that mattered to children's growth curves for socioemotional outcomes from K to 5. First, teachers in schools with more Title I services reported that their students increased their approach-to-learning, self-control, and interpersonal skills significantly more slowly but increased their internalizing behavior problems significantly faster. Teachers in schools with teachers and a principal who had more ESL experience described their children as increasing their approach-to-learning and interpersonal skills significantly faster and as increasing their internalizing and externalizing behaviors significantly more slowly. Teachers who thought their school's academic standards were too low reported that their children increased their self-control and interpersonal skills at a significantly slower rate over time. Teachers in schools with higher school stability reported that their students improved their approach-to-learning, self-control, and interpersonal skills significantly faster. Teachers in schools with better work climates for teachers reported that their students were improving their interpersonal skills at a significantly slower rate. Finally, teachers in schools with better physical facilities reported that their students were improving their approach-to-learning, self-control, and externalizing behavior problems at significantly faster rates.

As with the reading and math models, there was not much of a reduction in within-person variance across models due to the lack of time-varying Level-1 predictors. In each model, the variances in initial status and rates of change at Levels 2 and 3 were lower when compared to the unconditional growth model. Taken together, in Model 2, language exposure, school-level factors, and child and family characteristics jointly explained 15% (approach to learning), 12% (self-control), 15% (interpersonal skills), 8% (externalizing problems), and 14% (internalizing problems) of the variation in between-person initial status. For the variation in between-person rates of change, 6% was explained for approach to learning, 10% for self-control, 13% for interpersonal skills, 14% for externalizing problems, and 5% for internalizing problems. For the variation in between-school initial status, the figures were 16% (approach to learning), 14% (self-control), 15% (interpersonal skills), 12% (externalizing problems), and 3% (internalizing problems). For the variation in between-school rates of change, the figures were 10% (approach to learning), 6% (self-control), 8% (interpersonal skills), and 3% (externalizing and internalizing problems).

The three goodness-of-fit indices presented at the bottom of Table 8 (the deviance statistic, AIC, and BIC) indicate that each subsequent model provided a better fit than the previous model. Model 2 thus provided the best fit of all.

Figures 4.1 to 4.5 present five socioemotional trajectories from K to 5 based on Model 2 from Table 8 for the Asian children. The trends for the Asian group were similar to those for the Latino group with one exception: non-English Monolingual Asian children had the highest level of externalizing problem behaviors by fifth grade, despite starting out with the lowest level of all groups at kindergarten entry.

Discussion and Conclusion

It is no surprise to learn that children speaking a non-English language tended to have lower reading and math scores than their English-speaking peers upon entering kindergarten, or that this was

largely due to their generally disadvantageous family backgrounds. However, it is important to recognize that schools can play an important role as well in shaping these children's academic and socioemotional trajectories. The present analyses suggest that school-level factors explained at least one third of the reductions in the differences in children's academic performance after considering child, family, and school characteristics. In other words, schools can assist children with different levels of language exposure in narrowing the initial academic gaps with their "mainstream" peers. This is evident by the increasing rates of change in math scores for children with different language backgrounds.

Overall, the results showed that despite starting with lower math scores in kindergarten, Fluent Bilingual children fully closed the math gap with their English Monolingual peers by fifth grade. This promising result indicates that children with different language exposures perform on par with or even surpass their English Monolingual peers if the resources are in place to assist them. This result may also echo the findings from previous scholarship that bilingual fluency is positively related to academic achievement. However, because non-English-dominant Bilinguals and non-English Monolinguals started with significantly lower reading and math scores compared to their English Monolingual peers, by fifth grade they still had significantly lower scores. This was particularly true for non-English Monolingual children, especially in that they had significantly downward rates of change in reading and math.

Latino and Asian children who were not English Monolingual were doing better than English Monolinguals on their socioemotional outcomes, at least for those considered here. Fluent Bilingual and Non-English-dominant Bilingual children were surpassing every other group on all five socioemotional outcomes, with the highest levels of approach-to-learning, self-control, and interpersonal skills and the lowest levels of internalizing and externalizing behavior problems by fifth grade (or at least their teachers from each grade tended to rate them better over time). English-dominant Bilingual children and English Monolingual children had similar levels of socioemotional well-being. Non-English Monolingual children, however, were slipping. They were not only lagging further behind on their

reading and math scores over time, but they were also rated by their teachers as having the most troubling signs of socioemotional well-being, with low scores on social competencies and high scores on problem behaviors.

Given this paper focused on the academic and socioemotional trajectories of students with different degrees of language exposure, the discussion first concentrates on ESL instruction and services and their association with students' developmental trajectories. The results from the growth-curve analysis suggest that more ESL instruction was particularly helpful for the reading trajectories of Latino and Asian children, whereas having more services to ESL families was particularly helpful to the math trajectories of children for both the Latino and Asian groups. This finding is promising given research has found that 1 to 4 years of remedial language programs (e.g., pull-out ESL, content/sheltered ESL instruction when taught as a program with no primary language support, structured English immersion, and transitional bilingual education) may provide ELL students with important support in their academic learning (Collier & Thomas, 2004).

However, Collier and Thomas (2004) also argue that to truly maintain the beneficial effects of ELL language programs on academic achievement, even 4 years of remedial programs is not enough time to fully close the academic gap. The raw data in the present analyses indicate that students received an average of 3 years of such language programs. In addition, a dual-language enrichment model that teaches the mainstream curriculum through two languages could do more to improve ELL students' academic achievement; however, such a program would need to be offered for at least 6 to 8 years in order for ELL students to maintain the gains in academic achievement and to close the gaps with native-English speakers. The raw data in the present analyses indicate that about a third of children who spoke a non-English language at home did not receive any ESL instruction in kindergarten or first grade, and almost 50% of them did not receive any instruction in third grade. For children who did receive ESL instruction, the majority received it on a daily basis during kindergarten and first grade

(55.18% and 50.26% respectively), but only about a third received daily ESL instruction in third grade. In addition, about 40% of them received 31–60 minutes of ESL a day in first and third grade, respectively. Overall, the majority of children who spoke a non-English language at home and received at least some ESL instruction in school received less than an hour of such instruction daily from K to 3. ELL students who received at least some language programs were more likely to receive both bilingual and ESL programs (32% in kindergarten, 28% in first grade, and 24% in third grade) than just ESL instruction, although this was common as well. When schools offered ESL instruction or bilingual programs, ELL students received an average of almost 4 years of ESL instruction or almost 3 years of mixed ESL/bilingual instruction from K to 3.

It is important to note that the raw data suggest a downward trend in schools offering ESL instruction from K to 5. For example, the frequency of ESL instruction and the percentage of students receiving both ESL and bilingual programs decreased from K to 3 on average across the study sample (much of this information was not collected in fifth grade). As shown in this study, for the cohort of students entering kindergarten in 1998, schools did not have the resources to provide relevant ESL and bilingual programs. Even with enough resources, it is essential to have an active and committed principal who (a) hires qualified teachers, (b) plans collaboratively with teachers and staff who are involved in ELL students' education (e.g., bilingual and ESL specialists), and (c) provides ongoing staff development and planning time (Collier & Thomas, 2004). Indeed, the findings from this study suggest that these school factors played important roles in ELL students' learning trajectories.

The present analyses found that schools offering more services for ESL families (e.g., having translators available for parent-teacher conferences and outreach workers to help families (e.g., home visits) showed increases in the math learning rates of children with various language exposures compared to English Monolingual children. This finding is particularly valuable in the context of the NCLB

in that when ELL students and families receive relevant resources and services, they can perform on par with or even surpass their mainstream peers.

Additionally, consistent with the education literature (Bogard & Takanishi, 2005; Reynolds, 2003), schools with greater teacher's effort (e.g., frequency of meeting with other teachers to discuss class planning, curriculum development) and better physical resources (e.g., if the cafeteria, computer lab, and library meet the students' needs) were significantly associated with faster reading and math learning rates. These results may be a manifestation of the inadequate resources often found in schools with large poor/minority student populations (Masten, 1994), which is essentially a form of modern-day segregation (García Coll et al, 1996). Conversely, adequate resources may benefit students' academic trajectories. Conversely, adequate resources may benefit students' academic trajectories. Most important, these factors have recently been touted as integral to PK-3 education in that they (a) provide continuity (as proxied by school stability) and promote educational consistency, (b) support effective school leadership and the hiring and retention of qualified personnel and infrastructure resources[5], (c) encourage communication among teachers and between teachers and parents, and (d) provide family support services (e.g., Title I services, services/programs for ESL families) (Foundation for Child Development, 2005).

However, while ESL-related programs and services seem to benefit children's academic trajectories, their associations with children's socioemotional outcomes were more complicated. In fact, children in schools providing more Title I services and having teachers and a principal with more ESL-related experience were more likely to have teachers rate them unfavorably on various socioemotional outcomes. Furthermore, these students tended to increase their positive social skills much more slowly but increase their problem behaviors much more quickly compared to their peers in schools with fewer Title I and ESL services. Of course, this result could also have been due to the fact that these

[5] Similar to the variable in this analysis measuring ESL instruction, which includes the ratio of ESL/Bilingual teachers to students, Title I services, and services/programs for ESL families.

socioemotional outcomes were reported by teachers, and more troublesome, by different teachers in different grades. Although it is beyond the scope of this study and we can only speculate, this result could also reflect teachers' attitudes in schools with certain characteristics. Schools with more Title I services are also more likely to serve students from low-income and/or minority backgrounds. Schools serving more minority or ELL students are more likely to have teachers and a principal who have more ESL-related experience. These associations echo previous findings on teachers who tended to rate minority and low-income students as less competent (Alexander et al., 1994; Sbarra & Pianta, 2001).

It is important to note that teachers in more stable schools (e.g., less teacher absenteeism, teacher turnover, and children absenteeism) and schools considered to have insufficient academic standards tended to describe their students as increasing their positive social skills faster and increasing their problem behaviors more slowly.

Still, although most of the school-level factors were related to children's academic performance at each point even after controlling for a range of covariates, only a few were important to children's academic *trajectories*. Similarly, it is not clear why certain school-level factors were important to children's reading trajectories but not to their math trajectories and vice versa. For example, although children attending public schools had significantly lower reading and math scores, they had significantly faster rates of change from K to 5. These seemingly contradictory findings reveal the multifaceted nature of school factors. For instance, public schools often face challenges such as a lack of funding or resources, but being surrounded by a peer group with similar characteristics may provide a sense of belonging that promotes children's learning. Nonetheless, the school-level factors that were found to be significant to children's learning trajectories were mostly proxies for school resources that may enhance students' learning experience (i.e., public schools, services to ESL families, teacher's effort, and physical resources). In contrast, the finding that the school's learning environment and supportive teaching environment and work climate were not important to the academic *trajectories* from K to 5 for children

speaking a non-English language at home reinforces prior findings that certain school contextual factors are important to the learning experiences of all children. This is not to say that these school-level factors are not important to students' learning experiences. In fact, they were significantly related to students' reading and math scores at each point of the assessment from K to 5, and the initial benefits may have provided a buffer to prevent underperformance in later grades.

Furthermore, a more supportive teaching environment indeed had consistently shown to have teachers rate their students to increase their positive social skills more quickly and their problem behaviors more slowly. Thus, the contradictory results from the academic and socioemotional trajectories highlight the complexities of promoting academic achievement in subjects and socioemotional well-being that may involve different competencies and resources.

Limitations

The results are limited in several ways. The first is the inadequate data on ESL instruction and practices. Although the ECLS-K collects a decent amount of information on ESL instruction (e.g., the frequency and amount of ESL instruction), the quality of ESL or bilingual programs was not available, and this has profound limitations for our understanding of the effects of ESL instruction on ELL students' developmental trajectories. Another limitation is the discontinuity of the information collected in the ECLS-K, and this is particularly the case for ESL-related information. For example, the frequency and amount of ESL instruction was only collected from kindergarten to third grade. Although we can only speculate, this discontinuity may reflect the assumption in the NCLB that ELL students should be on grade level in English in 3 years. This raises serious questions about the effectiveness of ESL instruction in improving ELL students' English proficiency and academic performance, particularly given the research that suggests a much longer span for ELL programs (Collier & Thomas, 2004).

A third limitation of the ECLS-K data (and secondary data sources in general) is that it does not include detailed information about what is going on in the classroom (e.g., the amount of time in which

the instruction is conducted in a non-English language, the amount and quality of support that teachers provide to students with different language abilities) or in the school (e.g., the materials available for language programs, the principal's support for language programs). These factors have been found to be crucial to the success of bilingual programs (August & Hakuta, 1997; Lucas et al., 1997), and thus these data limitations need to be considered when interpreting the results.

Fourth, scholars on bilingual education have advocated for the use of achievement tests in children's native language while they are still in the ESL or bilingual education program because academic test scores in English are likely to underestimate their true abilities. Once ELL students have reached full parity with native-English speakers, a curricular test in English should then provide just as valid and reliable a score as it does for native-English speakers. Thus we need to recognize that the direct academic assessments in the ECLS-K data (and other national datasets) may not truly represent ELL students' academic abilities.

Fifth, the ELL literature also highlights the importance of individual differences in the student learning experience in addition to environmental factors. In particular, studies on instructional practices for ELL students have found that even with the same quality of instruction, two children may respond differently and thus experience different outcomes (August & Shanahan, 2008). This finding highlights the importance of attending to the individual needs of students, particularly given that ELL students are a diverse group to begin with. Although this analysis considered both home language and English proficiency and separate analyses by Latino and Asian groups, the diversity within each group makes culture an elusive concept to capture (Portes & Rumbaut, 2006). For example, separating the analyses by ethnicity highlighted not only the similarities in the relationships of English proficiency and school-level factors with students' developmental trajectories, but also the diversity among Latino and Asian groups themselves. For instance, although Asian children are usually considered to be a "model minority," non-English Monolinguals in the Asian group were clearly struggling. In contrast, although

Latino children are oftentimes stereotyped as having lower academic performance, English-dominant Bilingual and Fluent Bilingual Latino children were doing as well as, if not better than, their English Monolingual peers. Therefore, while this study has provided a general overview of the academic and socioemotional trajectories of young children in various language groups, future research focusing on the similarities and differences within particular cultural groups is needed to provide us with a more in-depth understanding of young children whose home language is not English.

Sixth, research on how different types of migration are related to family background and in turn children's learning trajectories would shed light on the initial and long-term differences in the learning pathways of children with various language backgrounds. For example, immigrants from East Asia and India are more likely to hold a work visa and arrive as professionals; some Asian and Latin American groups, such as Koreans and Cubans, are more likely to be entrepreneurial immigrants; most Latin American groups tend to migrate as sojourners or with family reunification in mind and work in lower paying jobs; and Southeast Asians are likely to enter as refugees or asylees with a wide variation in family backgrounds. All of these factors shape immigrants' experiences in the US (Portes & Rumbaut, 2006). This selection factor is certainly important in understanding children's language backgrounds and performance in school.

Seventh, the different results of school-level factors observed between children's academic and socioemotional trajectories highlight the complexities of promoting both academic and socioemotional well-being, which may involve different teacher competencies and school resources. It is also noteworthy that the differences in children's socioemotional well-being have a great deal to do with the differences among and between individual children and not necessarily with the differences between schools. This may explain the lower variance in socioemotional well-being explained by the school-level variables. However, this result does not suggest that there is no role that schools can play in shaping children's socioemotional well-being. Indeed, given that children are likely to receive a great deal of

"feedback" from their peers during school years (Eccles, 1999) and that when children have a difficult time communicating and interacting with their peers and teachers due to language problems, such a "failure in communicating with peers and teachers" is likely to influence children's self-identity and self-worth.

Finally, although this study considered many covariates, the data did not include some important school-level characteristics that might help explain children's developmental trajectories. For instance, information on children's interactions with their teachers and peers might be valuable given previous findings on their influence on children's well-being (e.g., Conchas, 2001; Suárez-Orozco & Suárez-Orozco, 2001). Additionally, despite including some school-level variables (e.g., student poor/minority composition) that have been found to be associated with inadequate educational resources and academic failure, the data did not allow for a thorough analysis of factors important to the academic achievement and socioemotional well-being of children of non-English language backgrounds, such as racial discrimination and oppression. Future studies should utilize mixed methodologies to disentangle the still under-researched issue of the learning experiences of children with diverse language backgrounds.

Conclusions

With these limitations in mind, the results presented in this paper nonetheless provide empirical evidence to support the importance of school resources for students' learning progress. In particular, services to ESL families proved to be critical in making improvements in math for children. Schools with a supportive and positive teaching environment helped to allow children to increase their positive social skills more quickly and to reduce their problem behaviors over time. Although public schools and poor/minority student composition are not direct indexes for the level of school resources, the very significant association between these factors in prior studies also strongly suggests that the results here speak to the importance of school resources in providing students with an optimal learning environment.

This may be particularly true for ESL families, who stand to benefit more from these resources (e.g., through language programs and related services), especially when their children are in schools with inadequate resources to begin with. As shown in this study, an important reason that children who spoke a non-English language at home learned at a significantly faster pace than English Monolingual children from K to 5 was the school resources available to them and their families.

The present findings have important implications for practice. In particular, rigorous and high-quality ESL and other bilingual programs should be supported and increased, particularly for ELL students attending high-poverty schools with inadequate resources. These supports should be provided early and sustained throughout students' learning trajectories so that students can maintain their native language while gaining fluency in English. In addition to the benefits that these language programs seem to have for academic achievement and socioemotional well-being, maintaining bilingualism is important because scholarly research and larger global dynamics both suggest that bilingual and multilingual competencies will continue to gain saliency in an increasingly interdependent world.

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