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The Role of Siblings in the Development of Young Children
In Migrant and Seasonal Farm Worker Families

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By

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The Role of Siblings in the Development of Young Children in
Migrant and Seasonal Farm Worker Families

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There are almost 2 million migrant and seasonal farm workers (MSFWs) in the United States and when the workers' family members are included, the farm working community totals 3 to 5 million people (Colt et al., 2001; U.S. Department of Labor, 2000). To date, the MSFW population has been largely unstudied. The purpose of this study was to investigate how siblings relate to and influence the development of preschoolers in migrant and seasonal farm worker families. Theories such as the confluence model and the resource dilution theory posit why children in larger families tend to achieve less in multiple domains such as language, literacy, and cognitive ability. However, these models have not been applied to the MSFW population, which is distinctive from the mainstream population and other Latino populations in the United States. Data were collected from 229 direct child assessments in Migrant and Seasonal Head Start Centers in Florida and 332 interviews with parents. Results show the number of siblings, particularly older siblings, was significantly related to young children's increased English language skills. Furthermore, siblings' English language skills appeared to have a stronger relationship with preschoolers' English language skills above and beyond parents' English language skills. However, the number of siblings, whether older or younger, did not have a negative relationship with children's development in cognitive, social, general language, or pre-writing skills. Therefore, siblings may play a particularly important role in helping young children from MSFW families learn English but

their relationship to other developmental domains is still unclear. Findings indicate that models of how siblings influence child development used for the mainstream may not be applicable to this largely Latino, immigrant population. Limitations and future directions for research with MSFW families are discussed.

This dissertation by Corine Ashley Bell fulfills the dissertation requirement for the doctoral degree in Clinical Psychology approved by Sandra Barrueco, Ph.D., as Director, and by Brendan Rich, Ph.D. and Benjamin Hinnant, Ph.D., as Readers.

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Dedication

This dissertation is dedicated to Frank and Diana Bell, to the farm workers who make sure the country has food but often go without necessities for themselves and their families, and to their children who are striving to beat all odds.

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The Role of Siblings in the Development of Young Children in Migrant and Seasonal Farm Worker Families

Cultural and familial processes affecting the children of migrant and seasonal farm workers are complex, dynamic, and minimally understood (e.g., Barrueco & O'Brien, 2011; Clare & García, 2007; Colt et al., 2001; Hansen & Donahue, 2003; Hernandez, 2004; Rothenberg, 1998). Migrant and seasonal farm worker (MSFW) children are embedded in families who are likely to be members of ethnic and language minority groups (Spanish-speaking Latinos) in the United States living within the harsh conditions of the migrant farm worker lifestyle. Past studies show how parents and siblings affect the environment in which children develop but studies have been conducted primarily in middle-class, European-American families (e.g., Dunn, 1983; East, 2009; Lamb, 1982). For example, siblings can encourage the growth of cognitive (Azmitia & Hesser, 1993; McAlister & Peterson 2006), language (Dunn & Shatz, 1989; Perez-Granados & Callanan, 1997), and socioemotional skills (Dunn, 1983; Lamb 1982; Perez-Granados & Callanan, 1997). However, the effects of these family members on the same domains for MSFW children are virtually unknown and may be unique. Due to poor, transitional living conditions, reduced access to and utilization of healthcare and early education resources, these families may function in fundamentally different ways than the mainstream population. In addition, given the extremely high rate of Latino ethnic backgrounds and recent immigration, cultural factors and acculturation will also influence family functioning, perhaps leading to unique child outcomes. Thus, there is a need to develop focused studies of child development in consideration of the realities and

circumstances of this community. This study specifically examines sibling and parent influences within MSFW families on young children's socioemotional, language, and cognitive development. Research on the roles of farm worker and Latino culture, acculturation, and families, especially the role of siblings, is reviewed due to their integral functions of providing the background for child development in this distinctive population.

Who comprises the Migrant and Seasonal Farm Worker community?

There are almost 2 million MSFWs in the United States and, when the workers' family members are included, the farm working community totals 3 to 5 million people (Colt et al., 2001; U.S. Department of Labor., 2000). According to the National Agricultural Workers Survey (NAWS), MSFWs are typically hired field laborers who travel at least 75 miles for employment depending on the growing season (U.S. Department of Labor, 2000). Seasonal farm workers may remain in one general location while migrant farm workers may reside in various regions depending on crop harvesting times (e.g., living in the south for the winter and then traveling northward in spring). MSFWs are involved in planting and harvesting fruits, nuts, vegetables, and field crops such as cotton. Migratory life includes strenuous manual labor, long hours, and difficult living conditions (e.g., poor housing and sanitation) for these workers and their families with minimal pay (Hernandez, 2004).

Most workers are young males who are married and migrate with their spouses. Almost half of workers have children and one quarter of farm workers have children in their homes (U.S. Department of Labor, 2005). It is estimated that at least 250,000 children move with their families from farm to farm at multiple points throughout the year (U.S. Department of Health and Human Services (DHHS), 2002). In addition, more than 80% of farm workers

are born outside the U.S. with the majority coming from Mexican descent. While over 60% of farm workers live below the poverty line (DHHS, 2002), foreign-born MSFWs and large MSFW families are especially likely to live below the poverty line (U.S. Department of Labor, 2000).

Information on MSFW children is predominantly collected through federal agencies, although they admit that finding and tracking the families is difficult and incomplete (Hansen & Donahue, 2003; U.S. DHHS, 2002; U.S. Department of Labor, 2000). MSFW children develop in an environment plagued with risks from farm working, migratory life, and acculturation which directly and indirectly affect their functioning (Aguilera-Guzman, de Snyder, Romero, & Medina-Mora, 2004; García Coll, 1990; Hill et al., 2003; Kandel & Kao, 2001; Weiss, Goebel, Page, Wilson, & Warda, 1999; Zhou, 1997). There is growing concern about the children's physical and mental health risks embedded in their disadvantaged communities in addition to the stressors faced by their parents, including language barriers to resources and discrimination from the dominant culture (Corona, Lefkowitz, Sigman, & Romo, 2005). Understandably, children and their families may display patterns of stress which may be manifested in less family cohesion or difficulty coping over time (Roosa, Morgan-Lopez, Cree, & Specter, 2002).

Due to the distinct qualities of the MSFW population, it will be helpful to utilize a theoretical framework that accounts for multiple levels and types of influence on child development in order to understand the current conceptualization of the community as well as how to incorporate new research into the population's context. The ecocultural theory illustrates how a family's cultural environment, including social norms, language, and

resources, are influenced by the surrounding community and in turn, dictate the role and expectations for the development of the children in the family (Bronfenbrenner, 1979, 1986; Fuller & Garcia Coll, 2010; Harkness, & Super, 1983; Weisner, 2002). Barrueco and O'Brien (2011) developed a specific model for MSFW child development for families who participate in Migrant and Seasonal Head Start (MSHS) programs. The model captures the different levels of influence on MSHS children including: child characteristics; family, home, and MSHS experiences; community, state, and federal policies and agencies; country of origin and acculturative values, beliefs, and practices; along with time, agricultural conditions, and migration processes. Each level influences each other in a bidirectional manner and affects the child's health and growth. Much of this model is followed here, from children's specific characteristics such as neurological development to the wider understanding of societal impacts on development.

MSFW Child Development

Poverty in MSFW Families. Poverty alone has a constellation of detrimental effects on multiple levels of child development and family functioning which are no doubt present in the MSFW population. More than 30% of MSFW families' total income fell under the federal poverty line with three quarters of the population averaging around \$10,000 per year (U.S. Department of Labor, 2005). The likelihood of poverty increases with the number of people living in the home, especially in families with more than three members (U.S. Department of Labor, 2005).

Poverty has been strongly linked with less than optimal child development outcomes in a variety of domains. For example, children from low-income homes have lower levels of

academic achievement throughout and beyond schooling (McCardle et al., 2001; National Center for Education Statistics (NCES), 2008; Schatschneider, Fletcher, Francis, Carlson, & Foorman, 2004; Storch & Whitehurst, 2002; Zill & Resnick, 2006). Furthermore, poverty is associated with a greater likelihood of behavioral difficulties in children (Chang, Halpern, & Kaufman, 2007; Evans, 2004; Evans & English, 2002; Raikes & Thompson, 2005).

There are a variety of mechanisms by which poverty influences children. Along one vein, the stress of poverty affects family functioning and parent-child interaction (Kiernan & Huerta, 2008; Scararnella, Neppl, Ontai, & Conger, 2008). Parents from low-income homes tend to converse less with their children which is related to poorer vocabulary development compared to more financially secure families (Hart & Risley, 1995; Hoff, 2003). In turn, Connell and Goodman (2002) found that increased financial stress negatively relates to maternal sensitivity with children. In low-income families, financial worries can also increase the likelihood of maternal depression (Pettersson & Albers, 2001). Mexican Americans are among the most economically disadvantaged group in the United States (Hill, Bush, & Roosa, 2003; Kandel & Kao, 2001). Further, Mexican American mothers in poverty show increased rates of depression (Dennis, Parke, Coltrane, Blancher, & Borthwick-Duffy, 2003). Maternal depression has negative implications for their communication, relationships with children, and children's development including elevated internalizing and externalizing problems (McCarthy & McMahon, 2003; Weissman, Warner, Wickramaratne, Moreau, & Olfson, 1997). However, poverty is only one of the obstacles MSFW children face.

Living Conditions and Physical Health. Research is beginning to examine how the complex environments of MSFW life affect children medically. Children's physical health remains one of the greatest concerns regarding this vulnerable population. MSFW children's health is severely impacted by their high-risk living environment. Children in agricultural families may be directly exposed to dangerous toxins and weather because their parents bring them to the fields out of necessity (e.g., Frank, McKnight, Kirkhorn, & Gunderson, 2004; Koch, 1988). Health risks from their parents' work conditions include sun exposure and exposure to pesticides (Frank, McKnight, Kirkhorn, & Gunderson, 2004; Koch, 1988). Pesticides are of paramount concern as they can have long-lasting, devastating health effects and can be transmitted in utero (e.g., Perara et al., 2003; Rosenstock, Keifer, Daniell, McConnell, & Claypoole, 1991). In addition, there is some evidence that children may assist their parents in the fields for multiple reasons, one being to help bring in income, which leads to increased exposure through breathing and skin absorption (e.g., Bey, 2003). Therefore, pesticides can be transmitted directly to children in the fields and through placental transmission.

Children are also exposed to pesticides through indirect, environmental means. Parents' clothing can carry toxic chemicals into homes or pesticides can infiltrate homes through piping and the water supply as MSFW homes are often near the fields and do not have proper sanitation mechanisms in place (McCauley, Beltran, Phillips, Lasarev, & Sticker, 2001). The negative effects of pesticides on physical health are extensive especially for children. Pesticide exposure, especially to organophosphate (OP) based pesticides, is detrimental to the function of the central nervous system (Rosenstock, Keifer, Daniell,

McConnell, & Claypoole, 1991). Prenatal exposure is especially connected to deficits in cognition, such as poorer working memory, processing speed, verbal reasoning, and perceptual reasoning; 1.5 to 2 year developmental delays have also been identified (Bouchard et al., 2011; Harari et al. 2010; Rauh et al. 2006). When considering general intellectual abilities, Bouchard and colleagues (2011) found that cognitive scores decreased up to seven IQ points over time, in direct relationship to the level of pesticide exposure migrant, farm worker children experienced prenatally. In another study of 7-year-old children, exposure to prenatal OP pesticides was related to lower functioning in neuropsychological areas such as memory and attention (Ruckart et al., 2004). Concurrent exposure to OP pesticides also has been linked to impaired executive functioning in 6-year-old migrant farm worker children (Lizardi, O'Rourke, & Morris, 2008). Further, researchers found neurological consequences to OP pesticide exposure including less developed fine motor skills among preschool-aged, agricultural children (Rohlman et al., 2005).

In addition to pesticides, poor living conditions, as found in many MSFW homes, is related to increased cases of parasites and high lead levels which adversely affect children's development (e.g., Slesinger, 1992). Children are more susceptible to low levels of dangerous chemicals in pesticides, foods, and synthetic materials because of their small size and tendency to touch and mouth objects (Carlson, 2005). These substances are more prevalent in developed countries as well as concentrated in low-income communities.

Beyond living conditions, MSFW children's health is also at risk due to poor nutrition and healthcare. MSFW children have significantly more vitamin deficiencies, lower immunization rates, and poorer oral health than peers (Koch, 1988; Thomas, 1996; Weathers,

Minkovitz, Ocampo, & Diener-West, 2003). These health risks make children more vulnerable to infection and diseases. MSFWs have low rates of health-seeking and utilization behaviors for themselves and their children due to inadequate services in rural areas, limited insurance, lack of transportation, and poor health education (Anthony, Martin, Avery, & Williams, 2010). Farm worker children are particularly disadvantaged because even if they are eligible for insurance through Medicaid, only one in five MSFW children are actually enrolled and fewer have access to services (Casamassimo, 2003; Mofidi et al., 2002).

Academic Achievement. Beyond physical health concerns, MSFW children's development in academic domains is of concern. The limited literature regarding the functioning of migrant children and youth points to the accurate descriptor as this group being among one of the "most academically vulnerable groups in the United States" (Martinez & Cranston-Gringas, 1996; López, Scribner, & Mahitivanichcha, 2001, p. 253; Zalaquett et al., 2007). Studies on very young children tend to focus on domains such as pre-academic skills (e.g., emergent literacy skills), cognitive skills, behavioral problems, and socioemotional development.

One of the most researched domains is early language development as this domain is an important indicator of school success (Dickinson & Tabors, 2001; McCardle, Scarborough, & Catts, 2001; NICHD Early Child Care Research Network, 2002) and is an essential basis for subsequent learning (Knudson, et al., 2006). Ezell, Gonzales, and Randolph (2000) conducted a study with migrant, Mexican American preschoolers and found mixed results on measures of emergent literacy skills. For example, on a measure of recognizing print common in their environment, MSFW preschoolers scored below average

while scores regarding concepts about print were average for 4-year-olds. The authors found the literacy environment in the home to be the most important influence on emergent literacy skills. Related to this, MSFW families are less likely to engage in the language and literacy activities which support school performance (Shields & Behrman, 2004). Other studies have found that MSFW children are behind their peers on measures of emergent literacy skills in pre-school and when they enter kindergarten (Gonzalez & Uhing, 2008; Vernon-Feagans, Hammer, Miccio, & Manlove, 2001). Further, the migrant lifestyle disrupts their educational progress in later school years and puts them at greater risk for underachievement (Cranston-Gingras & Anderson, 1990).

The studies about longer-term academic achievement of MSFW children are scant. Frequently, it is difficult to track MSFW children longitudinally as documentation from state to state can be lost or does not follow the students at all as they move (Clare & García, 2007). The added complexity of educational documents following students in migrant families may result in repeating grades and increased frustration which is linked to drop out rates (Clare & García, 2007). In addition, these young, Latino students must struggle with learning academic material while learning a new language and new cultural norms in an unfamiliar system. Migrant students are often placed in “special needs” settings because they are behind grade level(s) (Tatto et al., 2000). Thus, it is challenging to evaluate MSFW children’s abilities and achievement through the typical means which are more accessible with the mainstream population.

Cognitive Development. The few studies that report on cognitive functioning in MSFW children used measures that have not been validated with this particular population

and may reflect the disadvantages of their circumstances rather than objectively measure their cognitive potential. Siantz and Smith (1994) found MSFW children scored over a standard deviation lower than same age peers on a general cognitive scale. Notably, the aforementioned toxins such as OP pesticides most likely influence children's cognitive abilities. Cognitive functioning is an area that continues to need further research taking the MSFW children's context into account.

Psychosocial Development. Additionally, there is a dearth of information about agricultural children's psychosocial functioning. In 1997, a pilot study conducted by Kupersmidt and Martin consisted of 110 MSFW children aged 8- to 11-years-old and found that 66% of the children had at least one psychiatric disorder. The most prevalent diagnoses were anxiety disorders which were at twice the rate of children in the general population (Kupersmidt & Martin, 1997). Mejia & McCarthy (2010) found that children of migrant workers in college exhibited increased rates of depression, anxiety, and acculturative stress compared to peers. Suarez-Orozco and Suarez-Orozco (2001) proposed that migrant children are deeply impacted by *social mirroring* which means these children are vigilant to how they are perceived by others. The authors found that social mirroring was one of the powerful mediators for educational and socioemotional well-being in migrant and immigrant children.

Parents' influence on MSFW children and family functioning. The physical and mental health of MSFW children as described above is inseparable from and directly affected by the well-being of their parents. Beyond the direct effects of migratory and farm working life on children, MSFW children are also impacted by their parents' physical health, as reviewed by Barrueco and O'Brien (2011). Migrant farm workers suffer from a variety of

health concerns including pesticide poisoning, musculoskeletal problems, infections, parasites, and sun exposure (e.g., Arcury et al., 2010; Bechtel, 1998; Center for Disease Control (CDC), 2006; Kandel, 1998). Musculoskeletal problems, the most common injuries, are conditions that affect the ability to work and how parents function in their families (Anthony, Martin, Avery & Williams, 2010). Most agricultural workers do not have paid leave or health insurance which hinders them from seeking treatment. Almost 60% of workers do not receive medical or dental care and only half of pregnant women in agricultural communities receive prenatal care (ACF, 2004). As a result of the confluence of health risks, poor living conditions, poor nutrition, and inadequate healthcare, the life expectancies of farm workers and their children are lower compared to mainstream populations (Kloosterman, Skiffington, Sanchez, & Kiron, 2003; Slesinger, Christenson, & Cautley, 1986; Slesinger, 1992). The implications for physical health are important for financial resources and availability of parents in MSFW families, but the effects of parental stress and mental health on young children in MSFW families also require empirical study.

Physical health concerns of parents in MSFW families are often coupled with mental health risks particular to this population. The mental health of parents is influential for children's developmental trajectories. Parents' mental health is vitally important to their relationships with their children and parenting practices (Cox & Paley, 1997; Hill, Bush, & Roosa, 2003) with each family member influencing each other in multiple ways (Corona et al., 2005; Minuchin, 2002).

Depression, anxiety, and migratory stress are all shown to be elevated in the MSFW population compared to mainstream populations as well as other Latino populations

(Alderate, Vega, Kolody, & Aguilar-Gaxiola, 1999; Hovey, 2002; Hovey & Magaña, 2000; Hovey, Magaña, & Booker, 2001). In recent years, anxiety particularly from immigration raids and investigations into documentation has increased in farm working communities impacting both parents and children (e.g., Capps, Casteñeda, Chaudry, & Santos, 2007). Migratory stress is unique and particularly acute for this population (Hovey, 2002; Hovey, Magaña, & Booker, 2001). The combination of stress and depression impairs typical functioning in social and behavioral domains for children (Connell & Goodman, 2002; Jacob & Johnson, 1997; Kane & Garber, 2004; McCarty & McMahon, 2003). Additionally, stress and depression can impact children by changing their parents' behavior.

As can be expected, stress has negative effects on parental behaviors in MSFW families. Siantz and Smith (1994) studied Mexican American agricultural families, their stress, and parenting styles in relationship to behavioral and socioemotional problems in Head Start Children. They found that when mothers perceived more social support, children exhibited better social functioning, as reflected in being more accepted by peers. In addition, maternal rejecting parenting style was significantly predictive of children's increased behavior problems. Interestingly, when fathers reported more social support, there was also an increased rejecting parenting style which increased behavior problems reported at home but not at school (Siantz & Smith, 1994).

In an updated study in 2010, Siantz and colleagues continued to find that greater parenting stress, maternal depressive symptoms, and rejecting maternal parenting styles, were related to children's emotional and behavioral problems. One key aspect in MSFW family functioning, particularly for mothers, is social support. Social support is extremely

important for migrant Mexican Americans mothers (Siantz, 1990). Siantz (1990) found that 75% of variance in maternal acceptance/rejection behaviors toward preschool children was due to perceived social support. The author noted that it is critical to identify mothers who feel isolated as it puts their children at-risk for low maternal warmth which, in turn, affects multiple domains of child development.

Family functioning is essential to the cognitive, psychosocial, and physical development of infants and preschool children (Garcia Coll, 1990; McCarty & McMahon, 2003). By parent and Migrant and Seasonal Head Start (MSHS) teacher report, maintaining strong family relationships can improve farm worker's resiliency and is related to children's socioemotional functioning (De Leon, Siantz, & Smith, 1993). However, there is a paucity of research on overall family functioning in the broader context of MSFW communities. The families are under intense economic and acculturative strain as well as prejudice from communities around them. For example, discrimination is a salient feature in the lives of many agricultural workers which increases stress in the home (Dalla & Christensen, 2005; Parra-Cardona et al., 2006; Ruiz, 2002; Wirth & Dollar, 2004). MSFW children also face negative experiences in their communities including discrimination and violence. In a study by Martin and colleagues (1995), over half of children from agricultural families had experienced some form of violence, either as witnesses or as victims. As described in Barrueco & O'Brien (2011), this rate of violence exposure exceeds national estimates and approximates those of poverty-stricken, high-crime urban areas (Richters & Martinez, 1993).

Furthermore, one can see how the families' circumstances may not change quickly with their many disadvantages that affect multiple generations. Ninety-four percent of both

parents and children are English Language Learners (ELLs) keeping the communities “linguistically isolated” (ACF, 2005). Although MSFW parents are extremely dedicated to their children’s educational success and linguistic proficiency in English and Spanish (e.g., Gloria & Segura-Herrera, 2004), there are numerous social and economic obstacles that hinder their efforts. Therefore, families in a Latino, immigrant population such as the MSFW community must overcome enormous challenges in order to achieve even minimal gains in U.S. society.

Latino, Mexican American, and Immigrant Families

Given the generally scant body of research that has been conducted to date with MSFW young children and families, this study was particularly informed by investigations conducted with the broader Latino (and specifically, Mexican-American) and immigrant communities. A general overview of risk factors for the population is first presented, followed by a description of the key protective considerations, namely the Latino family system. Subsequently, a brief review on Latino child development is presented, followed by a final section about the role of siblings on such processes.

Latinos comprise approximately 90% of the migrant and seasonal farm worker population, with about three quarters of the workers born in Mexico (U.S. Department of Labor, 2005). Unfortunately, being Mexican American or having a Latino background is also associated with outcomes such as lower socioeconomic status, lower educational achievement, and poorer health than other ethnic groups in the US (Chapa & De La Rosa, 2004; Hidalgo, 1998; Hurtado, 1995; Ramirez & de la Cruz, 2002). In the US, Latinos, and particularly Mexicans, are more likely to be in poverty compared to other ethnic groups

(Ruiz-de-Velasco & Fix, 2000). Further, in immigrant families, which are primarily of Latino backgrounds, one in five children live below the U.S. poverty line (Hernandez, 2004). Latino children and adolescents are at high risk for dropping out of high school and substance abuse (Buriel & Hurtado-Ortiz, 2000; National Center for Education Statistics, 2008; U.S. Census Bureau, 2010).

Immigrants are faced with the additional challenges of integrating into a new society such as accessing adequate employment, education, and healthcare resources. Other factors such as language minority status and low-wage jobs often keep immigrants from upward mobility in society over generations (Beavers & D'Amico, 2005; Douglas-Hall & Koball, 2004; Hernandez, 2004). One of the barriers for parents and children in the Latino and immigrant community is low English proficiency. Over 80% of children of Mexican origin have parents who are English Language Learners and predominantly foreign-born (ELLs; Fortuny, Hernandez, & Chaudry, 2010). However, the number of children who are foreign-born is significantly less than their parents. Almost 80% of all children in immigrant families were born in the US and, among children below the age of six, 90% were born in the US (Hernandez, Denton, Macartney, 2008).

Still, the experience of immigration, either through their families or how society treats them, profoundly affects children even though they may not be immigrants. Latino groups are also likely to face discrimination regarding ethnicity and social class which influences families' abilities to achieve educationally and economically (Durand, 2011). Discrimination has been linked to poorer physical and mental health outcomes in many groups including Latino Americans (Williams, Neighbors, & Jackson, 2008). The concern for children in

immigrant families, who are predominantly of Latino heritage, is growing due to their high rate of environmental stress and poverty, in addition to their parents' struggles with poverty, limited English-speaking ability, and acculturation challenges (Corona, Lefkowitz, Sigman, & Romo, 2005). Positively, González and Padilla (1997) showed a sense of belonging significantly predicted academic resilience and achievement for Mexican American students.

Besides the disadvantages of language barriers and low-income, Latino students also face educational risks. Children whose parents are from Mexico have lower high school graduation and college enrollment rates (García, 2001; Ruíz-de-Velasco & Fix, 2000). Sadly, children who are in migrant families have even lower rates (Valenzuela, 1999). Additionally, when at least one parent is of immigrant status, children are at risk for poorer educational and occupational outcomes than children without parents who are immigrants (Hernandez, 2004). Over 60% of children of Mexican heritage have parents who are both immigrants (Fortuny, Hernandez, & Chaudry, 2009). Finally, low teacher expectations of Mexican-American children have been linked with poorer academic performance (Martinez, 2003).

The Latino and Immigrant Family Systems. There are protective factors to note in families from Latino backgrounds that build and strengthen well-being (Landale, Oropesa, & Gorman, 2000; Rosenberg, Raggio, & Chiasson, 2005). One protective factor relates to the traditional Latino value of *familismo*, which encourages family cohesion, warm relationships, and obedience to parents (Halgunseth, Ispa, & Rudy, 2006; Sabogal, Marin, Otero-Sabogal, Marin & Perez-Stable, 1987). *Familismo* emphasizes the importance of the family's needs over the individual's needs. Evidence suggests that *familismo* is a protective factor for Latino families and has been linked to lower levels of substance and drug abuse (Gil,

Wagner, & Vega, 2000; Unger et al., 2002), decreased likelihood of child maltreatment (Coohey, 2001), and operates to protect against negative mental health outcomes in Latino youth and parents (Ayón, Marsiglia, & Bermudez-Parsai, 2010). Further, strong family involvement can contribute to optimal child development (Clare & García, 2007; Martinez, 2003; Valencia & Black, 2002), and shape long-term social and cognitive performance of Latino youth and children (Belksy & MacKinnon, 1994; Solis, 1995; Whiteside-Mansell, Bradley, & McKelvey, 2009).

Migrant children, specifically, may be more influenced by their families than dominant culture children (Clare & García, 2007). Parra-Cardona and colleagues (2006) found that being family-focused was a strong contributor to parents' report of their resiliency in Mexican-origin migrant families. Specifically, parents report that children tend to be a "source of inspiration when facing adversity and extreme hardship" (p. 372) and become the focus of parents' hard work. Dedication to family members and working to improve children's lives contribute to making meaning of adversity and higher life satisfaction (Parra-Cardona et al., 2006; Walsh, 2003).

Overall, Latino families display distinctive familial and communal processes that promote children's psychological well-being as found in values such as *familismo* (Harker, 2001). One manner in which the strong family-focus is manifested is in household composition. Families from Mexican origins tend to live with more people than mainstream populations (Hernandez, Denton, & Macartney, 2009). For example, grandparents, siblings, and non relatives are more likely to live in immigrant homes than native-born families (Hernandez, 2004). About 40% of school-age children in immigrant, Mexican families live

in housing classified as “overcrowded,” where there is more than one person per room.

Hernandez and colleagues note these homes may create conditions that are less amenable to studying, and studies of crowded housing situations find educational and socioemotional implications (Evans, Saegert, & Harris, 2001; Hernandez, Denton, & Macartney, 2009). On the other hand, the presence of these family members can be beneficial at times when individuals pool resources and share responsibilities. Indeed, higher ratios of adult family members in the household have been identified as a protective factor within the Latino community, although larger families are associated with poorer outcomes in other populations (Buriel & Hurtado-Ortiz, 2000; Chase-Lansdale & Pittman, 2002; McLanahan & Sandefur, 1994). More adults in the household, including fathers and grandparents, tend to have positive impacts on children including more income, supervision, teaching, and social support (Hernandez, Denton, & Macartney, 2009). Overall, though, the literature on the role of other family members, such as grandparents and siblings, in Mexican American families or Latino American is sparse.

Beyond *familismo*, Mexican American families have other cultural aspects that are infused in their lives in the US and may benefit child development. For example, many Mexican families are religious (Hernandez, Denton, & Macartney, 2008), which is often carried over into their lives in the US. Arzubiaga et al.’s (2002) study indicated that migrant children, who were primarily of Mexican heritage, had more success with reading when their family involved them in literacy activities specifically related to the family’s religious practices.

In addition, in many Mexican American families, mothers are described as the primary socialization agents who impart cultural values on children and structure the family environment in order to reinforce those principles (Valdés, 1996). Mothers in Mexican origin families have specific roles and distinct parenting practices. For example, child-rearing norms for Mexican American mothers often include more interdependence between mothers and children and less emphasis on children's early self-reliance skills (Falicov, 2005; Schulze et al., 2001). These parenting practices may sometimes be at odds with the dominant culture and may lead to misperceptions of parenting in Mexican American families (Durand, 2011). In fact, several studies found maternal physical control positively related with secure attachment in Mexican infants and toddlers (Carlson & Harwood, 2003; Fracasso, Busch-Rossnagel, & Fisher, 1994). Whiteside-Mansell, Bradley, and McKelvey (2009) also found that Latino-American parenting behaviors function differently than European American and African American parenting behaviors. For example, responsivity, stimulation, and acceptance of the child predicted positive social development in African American and European American children but did not predict social development in Latino American children. Thus, it is imperative to examine how parental attributes and behaviors affect child development before and after birth within their specific cultural framework.

Latino Child Development. Latinos have fewer very low birth weight newborns and lower infant mortality rates than mothers from other ethnic groups (Fuller, 2009; National Center for Health Statistics, 2003). Further, out of multiple Latino subgroups, Mexican-American Latinas and less acculturated Latinas (Spanish-speaking dominant) had particularly low-rates of risky prenatal behaviors (i.e., alcohol and tobacco use) and the most robust

infants. However, Fuller (2009) found that health status and the rate of cognitive growth decrease in Latino children between 9 months and 24 months as compared to European American children. From that point, Latino children's development continues to be lower than European Americans and other ethnicities. Therefore, the protective cultural factors that lead to healthy births may not exert additional influence on child development in other domains when they are toddlers. The authors attribute this pattern to variables such as lower maternal education, fewer pre-literacy activities, and larger numbers of children in the home combined with lower socioeconomic status compared to European Americans.

Welsh and colleagues (2010) studied cognitive development in Latino children in prekindergarten and kindergarten and how it affected other developmental domains. They found that general cognitive domains such as working memory and attention control significantly predicted growth in emergent literacy and numeracy skills. In turn, these specific skills predicted math and reading achievement in kindergarteners. This study demonstrates the importance of cognitive growth on academic performance prior to school entry. Further, Pashak and colleagues (2008) found that interventions teaching and encouraging specific cognitive skills increased academic achievement for a sample of mostly Latino Head Start children.

Language and emergent literacy skills are additionally important to address in preschool and in the complex linguistic context of Latino families. Oades-Sese and Li (2011) recently found that close relationships affect Latino preschoolers' language development in English and Spanish. Positive parent-child and teacher-child relationships predicted better overall language skills for bilingual preschoolers. Further, Farver and colleagues (2006)

found that Latino parents' direct involvement in and encouragement of literacy-related activities is associated with better school readiness skills. This is promising as research has established that parents who talk with their children, tell them stories, and read them books support their language, literacy, and early learning (e.g. Carpenter, Nagell, & Tomasello, 1998; Dunham & Dunham, 1995; Goldenberg, 1994; Hart & Risley, 1995; Melzi, 2000; Neuman, 1999; Newland, Roggman, & Boyce, 2002; Pine, Lieven, & Rowland, 1997; Valdez-Menchaca & Whitehurst, 1992). Longan and colleagues (2008) concluded that shared reading is most consistently linked to children's improved oral language development. In particular, parents who utilize specific strategies in literacy activities encourage language growth in young children (Justice & Ezell, 2000; Valdez-Menchaca & Whitehurst, 1988). However, families who have low-incomes, low parental education, or language barriers are less likely to participate in these activities. In fact, the more risk factors present in a family, the less likely families will engage in the activities that support early childhood learning (Bowman, Donovan, & Burns, 2001; Farver, Xu, Eppe, & Lonigan, 2006; Hart & Risley, 1995; Yarosz & Barnett, 2001).

Literacy practices and their regularity in migrant families' homes are largely unknown as few studies focus on this particular population (Ezell et al., 2000; Gonzalez & Uhing, 2008). Almost half of Spanish-speaking parents without high school diplomas reported never reading to their preschoolers (Yarosz & Barnett, 2001). In Latino, immigrant families, few books are available and mothers may read to their children only a couple times each month (Boyce et al., 2004). It has been suggested that Latino families may be engaging in literacy activities other than book reading (Delgado-Gaitan, 1992; Reese & Gallimore,

2000). For example, families may be more accustomed to oral storytelling and use narratives extensively (Henning-Stout, 1996). However, a national study did not find evidence of increased story telling rates (Barrueco et al., 2007).

Latino immigrant children's English language development is another key consideration in their growth. Encouragingly, Latino children can reach similar achievement in English skills as their English speaking peers. Fitzgerald and colleagues (2008) found that English language learning students in first through third grade were not significantly different from peers on English reading tasks. As such, ELL students overcame a large language disadvantage within a short amount of time. Other studies tracking kindergarten through second grade ELLs found that ELL students achieved reading levels similar to native English speaking peers especially when at-risk students were provided appropriate interventions (e.g., Araujo, 2002; Hutchinson, Whiteley, Smith, & Connors, 2003; Lesaux & Siegel, 2003; Manis et al., 2004; Weber & Longhi-Chirlin, 2001). However, many studies document the gap in achievement for ELL students throughout their educational career and they often do not receive the appropriate services to help them succeed (e.g., Aud, Fox, & KewalRamani, 2010; Lee, 2002; National Center for Educational Statistics (NCES, 2009) Literacy skills for children from Spanish-speaking homes is particularly supported by bilingual education that builds on the foundational skills of their first language as they are introduced to reading in their second language (Clare & García, 2007; Cummins, 2001; Goldenberg 1994, 2008).

There is very limited research on children's socioemotional development in Latino families. Research is more extensive on older Latino children and youth. In a national study with 11 to 15 year olds, Saluja et al. (2004) found that 22% of Latinos reported depressive

symptoms at a higher rate than in Asian-Americans (17%), European Americans (18%), and African Americans (15%). Mexican-American youth, specifically, experience more depressive symptoms compared to other ethnicities (Choi, Meininger, & Roberts, 2006; Mikolajczyk et al., 2007; Ramos, Jaccard, & Guilamo-Ramos, 2003). Anxiety disorders also appear to be more prevalent in Latino youth in comparison to European American youth (Glover et al., 1999; Roberts, Roberts, & Xing, 2006), although no national studies have been conducted to date. Roberts and colleagues (2006) reported that 8% of Mexican American 11 to 17 year olds had an anxiety disorder. Potochnick and Perreira (2010) found that factors involved in immigration and migration place Latino youth at greater risk for depression and anxiety. It is urgent that research focus on young Latino children and begin understanding their development and possible trajectories that lead to higher rates of psychopathology.

Extant research with young Latino children has mixed results regarding socioemotional health. Weiss and colleagues (1999) found that Latino preschoolers were generally well-adjusted and did not exhibit significantly more emotional or behavioral problems than peers. However, they were more susceptible to depressive symptoms and social withdrawal when parents were dissatisfied with family interactions and families used internal coping mechanisms. In addition, Perez Rivera and Dunsmore (2011) found that Latino mothers who were less acculturated to U.S. culture believed in guiding children's emotions. These Latino children displayed lower emotion understanding on several measures. The study demonstrated the importance of conversations about emotions between parents and children which, in turn, affect how children identify, display, and understand emotions.

However, in Latino families, parents are not the only socializing agents. Parents are often rooted in extended families and communities that participate in childrearing. Marshall and colleagues (2001) found that parents' social networks can indirectly affect socioemotional development and behavior in young children by influencing parenting. Parents who received more emotional support had increased positive parenting behaviors, such as being more receptive to their children's needs, and showed more warmth and responsiveness. These parents provided a stimulating home environment and felt more confident in their parenting practices. Their children scored better on measures of social competence and displayed fewer behavior problems than parents who had less positive parenting characteristics and less support (Marshall et al., 2001). Much more research is needed on the precise pathways of socioemotional development in Latino children as well as subpopulations such as migrant farm workers.

It should be noted that although many Latino preschoolers are at-risk for poor outcomes due to the myriad of experiences presented above, appropriate interventions can improve children's developmental trajectory. Mendelsohn and colleagues (2007) demonstrated that interventions that improved parent-child relationships could impact cognitive, language, and behavioral trajectories for low-income, Latino preschool children. Their intervention helped to reduce parenting stress and increase maternal warmth in a population with low maternal education. In turn, Barrueco (2012) found positive effects of a multi state intervention involving parents on the linguistic, literary, and socioemotional development of MSFW children in a large study (n=350). The effectiveness of interventions at this critical early period in children's lives makes research on early childhood development

even more essential. This research demonstrates that children who are in poor environments like those in farm working families can thrive if they and their parents are given the opportunity. However, in MSFW families it may be beneficial to understand how other family members, such as siblings, influence child development and to incorporate them into interventions as they also play an important role in childrearing.

Siblings and Family Composition

Due to an increasing portion of the U.S. population being of Latino heritage and the projected dominance of Latino children in the US in the near future, it is vital to learn more about this population's family life, developmental trajectories, child care, and school experiences (Cabrera & Garcia Coll, 2004; Contreras, 2002; Hernandez, Denton, & Macartney, 2008, 2009). It is imperative to study MSFW families as these children are one of the most at risk segments of the Latino population. Focus should be widened to include family members other than parents in research on young, Latino children's development in this family-centered population in order to expand the current literature.

The limited research on siblings in Latino homes show siblings are important in care giving, teaching, and socializing young children (Hafford, 2009). In Mexican American homes, siblings also play an important role in helping their parents learn about the experiences of younger children. Blocklin and colleagues (2011) found that Mexican American parents who were more oriented to their Mexican culture than U.S. culture tended to ask siblings about the activities and well-being of other children in the family. When parents sought out external sources for information about their children, such as teachers or adults outside of the family, it indicated dysfunction in the family.

Sibling relationships are influenced by cultural values endorsed by the family and society. For example, *familismo* may play an important role in the construction of sibling relationships in Latino families. Children are taught the importance of close-knit family relationships and siblings are encouraged to have warm, intimate relationships (Hafford, 2009; Halgunseth, Ispa, & Rudy, 2006; Sabogal, Marin, Otero-Sabogal, Marin & Perez-Stable, 1987). These relationships can provide stability especially for immigrant and migrant children whose parents work long hours away from home (Hafford, 2009). Due to close ties in Latino families, older siblings' support and encouragement may positively influence younger sibling's school achievement and motivation (Cooper, Denner, & Lopez, 1999). These close ties are evidenced in the educational experiences children have at home. Older siblings have been found to significantly assist younger siblings by introducing them to the school system, monitoring their behavior, and helping them with schoolwork (Cooper, Denner, & Lopez, 1999). For example, past research indicates that multiple members of Latino families are involved with literacy practices (e.g., reading books at bedtime) including siblings (Valdés, 1996; Volk 1999). In addition, older siblings in Mexican American families who participated in postsecondary education are also significantly influential on younger siblings' postsecondary achievement (Hurtado-Ortiz & Guavain, 2007). Hurtado-Ortiz and Guavain (2007) found that older siblings help to provide educational guidance to younger siblings from high school to college since parents typically have limited experiences with higher education in the US.

Research with mainstream populations has shown that siblings can both positively and negatively affect children's development (McAlister & Peterson 2006; East, 2009). For

migrant children, parents and siblings may be their only source of stability in a tumultuous lifestyle (Ezell, Gonzalez, & Randolph, 2000). Other family members such as older siblings may acculturate more quickly to the US and may be more effective in guiding young children in certain domains of development, such as language or literacy skills needed to be prepared for formal schooling (Denner & Lopez, 1999; Hafford, 2009). The current study will begin to examine some of these factors and determine how siblings may relate to young children's development.

Although research on family composition regarding siblings and their effects on MSFW children and Latinos is largely non-existent, family structure has been examined in depth. Most studies have been conducted with middle-class, European-American samples. Overall, a greater number of children in the household is linked with lower cognitive scores and achievement. This finding appears robust across many ethnic groups (e.g., Falbo & Poston, 1993; Liu, Lin, & Chen, 2010; Zajonc & Bargh, 1980; Zajonc & Sulloway, 2007). The reason for this prevalent phenomenon is uncertain although several theories have garnered support in the field. The *confluence model* is a longstanding and widely known theory explicating the presence of lower achievement in households with more children and fewer adults (Falbo & Cooper, 1980; Liu, Lin, & Chen, 2010; Zajonc & Bargh, 1980; Zajonc & Markus, 1975; Zajonc & Sulloway, 2007). The theory holds that the intellectual environment is less stimulating with the addition of another child, whereby child-driven conversation becomes more prevalent with less complex vocabulary and syntax in the home. In addition, parents may speak more frequently to the older, more verbally advanced child over the infant or toddler, and there may be an overall decrease in the number of individual

opportunities for building language skills. The confluence model is seen by some as a foundational theory and has led the field in explaining family structure and child outcomes since the 1980s. However, more recent theorists propose that it is not the “watering down” of the environment that inhibits optimal growth but rather the dividing of resources.

Specifically, the *resource dilution theory* stipulates that parents have less time, attention, and financial resources available with the addition of more children which, in turn, lead to poorer outcomes such as lower cognitive scores and educational success (Downey, 2001; Steelman, Powell, Werum, & Carter, 2002). Empirical support has been garnered for this theory; children from small families consistently benefit more from parental resources over children in large families (Steelman et al., 2002). Although research is promising, literature utilizing this theory is still in its infancy and continues to be sparse.

Indeed, there are some positive outcomes for larger families. Older siblings model or teach social, cultural, and educational norms to younger siblings who often assume the role of “learner” (Azmitia & Hesser, 1993; Perez-Granados & Callanan, 1997). In addition, siblings help to enhance social relationships and socioemotional development (Downey, 2004) and so may counterbalance some negative factors such as harsh parenting behaviors for large families. Further, research indicates negative factors in the family environment (e.g., effects of drinking or mental disorders) may be diffused in larger families (Downey, 1995; Steelman et al., 2002). Thus, the number of siblings may have beneficial and detrimental effects depending on specific circumstances.

Although some knowledge about siblings is known in mainstream and Latino literature, it is completely absent in the field of MSFW child research. Children, in general,

spend a significant portion of time with siblings (Dunn, 2007; Weisner, 1989). Latino siblings may spend even more time with their siblings because they often play a caretaking role for younger siblings (Hafford, 2009). This caretaking role is commonly found in Latino culture and may be even more necessary in farm working families. Parents may work for 12 hours per day in the field (U.S. Department of Labor, 2000) which may leave a caretaking void that siblings fill. There also may be periods of time or seasons where one parent may be separated from the rest of the family and other family members assume more responsibilities. The role of siblings in these circumstances is unknown but may be influenced by cultural factors pertinent to MSFW families. The extant literature regarding siblings and their influence on children's development in cognitive, language, and socioemotional domains will be reviewed.

Cognitive Development and Siblings. Studies show that older siblings can affect how younger siblings learn and develop problem-solving skills. Some research indicates that older siblings are able to instruct younger siblings comparably to parents and facilitate early learning skills (Cicirelli, 1976; Orellana, 2003; Pérez-Granados & Callanan, 1997). For example, older siblings can encourage cognitive development by providing instruction and opportunities to practice theory of mind and executive function skills (McAlister & Peterson, 2006). Sibling interactions often require children to utilize impulse control, thinking about the wants of another person, and the ability to compromise which are helpful in these specific domains. However, the quality of the instruction may need to be considered. Sibling guidance may not be as sophisticated as adult instruction which influences the speed and depth of learning (Perez-Granados, 2002).

Conversely, siblings may negatively affect the cognitive development of other children in the household indirectly by changing the home environment. In line with the confluence model, children born later in birth order tend to have lower educational achievement compared to first-borns (Falbo & Cooper 1980; Downey, 2001). Parents may experience more demands with the increased number of children and provide fewer individualized teaching opportunities with later children. Instead, older siblings may be given more responsibility over younger children and begin to teach their younger siblings academic and social skills which are helpful but not as beneficial as learning from adults.

Importantly, Latino siblings may play a salient role in providing a learning context of guided participation that helps generalize skills from home to school settings because of the close familial relationship and sense of responsibility for each other established by parents who adhere to traditional Latino values (Volk, 1999). Orellana (2003) found that Mexican-American students asked siblings for help on their homework more often than European-American students. However, older siblings may not be neither as proficient in these skills nor able to provide as much of an intellectually stimulating environment as adults as task difficulty increases (Perez-Granados, 2002).

Language Development and Siblings. The effects of siblings on language development are still unclear. Oshima-Takane and Robbins (2003) showed that simply having older siblings can alter the language learning environment for younger siblings. The authors also found that later born children learned language slightly slower than first born children although general language development was not significantly different. Younger siblings are more likely to be immersed in immature language by siblings rather than rich

adult language. Parents tend to utilize more child-centered learning techniques such as labeling objects and modeling syntax in language than siblings (Perez-Granados, 2002). In addition, mothers tend to direct more language toward older siblings when both older and younger siblings are present (Oshima-Takane & Robbins, 2003). The one exception Oshima-Takane and Robbins (2003) found in language development is younger siblings tend to learn personal pronouns faster than older siblings.

The language environment within the MSFW community may be different from mainstream patterns of language development as family members may have different levels of education and English language proficiency. As no studies have been conducted with MSFW children, it is necessary to turn to the broader Latino research. Ortiz, Innocenti, and Roggman (2004, 2005) found that family size and composition had mixed effects on Latino Head Start children's language development. In Spanish-speaking families, the presence of older siblings positively related to English language skills but did not benefit Spanish language skills. Furthermore, sibling age was also implicated as a significant contributing factor to preschoolers' language skills. The presence of school-age siblings was correlated with higher English skills than non-school age siblings. Notably, an interaction effect was found for siblings and parental English skills on children's English language skills. The influence of older siblings' on children's English language diminished when maternal English proficiency increased.

Evidently, levels of English language proficiency among siblings are extremely important to consider in relation to children's language development. Siblings' English language proficiency may affect the rate at which younger children learn English language

concepts. Overall, in language minority families, the oldest children are more likely to speak the parents' native language than later born children (Stevens & Ishizawa, 2007). Among Mexican immigrant families, 53% of school-aged children may be bilingual, speaking both English and a native language well (Hernandez, Denton, & Macartney, 2009). Ortiz (2009) found that more assimilated families (e.g., families with parents and children who were more English proficient) had Head Start children with higher literacy and language skills than Spanish dominant or Spanish only families.

Assessing English proficiencies in all children in the family is particularly important to study because English language skills can affect other developmental domains. Dawson and Williams (2008) utilized Hovey and Magna's (2000) conceptualization of Limited English Proficiency (LEP) status as an acculturative stressor and found an association with problem behavior. In turn, early problem behaviors are associated with later externalizing symptoms, low academic achievement, and poor social interactions (Achenbach, 1991; Olson, Bates, Sandy, & Lathier, 2000; Patterson, DeBaryshe, & Ramsey, 1989). Therefore, in the MSFW population, siblings and target children may be coping with the stress of language challenges, which may affect their wellness and the family system.

For families who immigrated to the US, older children may also have the added responsibilities of acting as an interpreter for their parents. They may monitor younger children who are navigating a new school system that is inaccessible to parents with limited English proficiency. Indeed, several studies have found that older Latino siblings tend to bridge the cultural and linguistic gaps between parents and schools (Cooper, Denner, & Lopez, 1999; Orellana, Dorner, & Pulido, 2003; Pérez-Granados & Callanan, 1997). Siblings

may fill in this vital gap between families and American institutions. However, it may also disrupt the established parent-child roles and undermine parental authority which is important in Latino families (Park, 2001; Portes & Rumbaut, 2001; Valenzuela, 1999). Research on preschoolers' general language skills, and specifically English language skills, is noticeably absent from literature on MSFW families.

Socioemotional Development and Siblings. The socioemotional skills and behaviors that children learn in early years have important implications for future success. Normandeau and Guay (1998) found that social behavior (e.g., cooperation, conflict resolution, responsibility) in kindergarten related to cognitive self-control and academic achievement in first grade. Additionally, Mantzicopoulos (2003) found that kindergarteners who were poorly behaved and less socially competent were less likely to be promoted to first grade. Socially competent children tend to be flexible, have good verbal skills, and emotion regulation skills (Oades-Sese, Esquivel, Kaliski, & Maniatis, 2011). Bilingual children in low income families who lack language competency may be at risk for social-emotional deficits and poorer academic outcomes (Oades-Sese et al., 2011). Therefore, it is necessary to understand how children learn social and emotional skills in their primary years especially in Latino families who have been neglected in research thus far.

Siblings are important socializing agents for children and older siblings may be foundational in teaching younger siblings social understanding (Dunn, 1989). As Dunn (2007) notes, sibling relationships are characterized by emotional intensity and intimacy which understandably affect how children learn to express themselves emotionally and interact with others. For instance, Dunn and colleagues (1991) showed that young children

who had a positive relationship with their older siblings tended to understand emotions in others better. Additionally, Sawyer and colleagues (2002) found that older siblings' positive emotional responsiveness related to preschoolers' increased social and emotional competence. The relationship between preschoolers' emotional responses and their older siblings' emotional reactions was moderated by child age, gender, and the age interval between siblings. However, sibling roles and expectations for sibling relationships vary between cultures and needs to be examined.

In many cultures, older siblings are given large responsibilities over younger siblings' lives including feeding, teaching, and disciplinary roles (Maynard, 2004; Orellana, 2003), although siblings enact these roles differently than parents. For example, siblings use harsher and more physically-based forms of discipline than parents which can affect children's health (e.g., more injuries) as well as social skills (e.g., more aggression) (Hafford, 2009; Perlman, Garfinkel, & Turrell, 2007). Older siblings in immigrant, Latino families play a significant role in the upbringing and socialization of younger siblings. For recent immigrants, siblings are intricately involved in caretaking, teaching, playing, and interpreting in non-English speaking families (Orellana, 2003). Latino siblings also teach and reinforce cultural values held by the family such as *familismo*, which encourages close family bonds, and *respeto*, which promotes obedience to authority figures (Hafford, 2009). These values may encourage special emphasis on sibling relationships. Gamble and Modry-Mandell (2007) found that Mexican preschoolers who had close sibling relationships had better social and emotional outcomes as well as fewer internalizing symptoms. Additionally, Latino adolescents benefit

from strong relationships with siblings in terms of their psychosocial, behavioral, and academic outcomes (East & Khoo, 2005; Gass, Jenkins, & Dunn, 2007).

Present Study

Adequate growth in the developmental domains reviewed above is integral for the well-being of MSFW children and requires clarification due to the pervasive lack of research on this group. Further, the role of siblings in the MSFW population is unclear given the considerations presented and needs to be examined. The influential nature of siblings on young children's development should be assessed, particularly in this family-centered population, and will be investigated in the current study in order to start filling in the knowledge gap.

In the current study, specific sibling and parent variables are explored in relation to child developmental domains. Siblings may be a significant factor in the development of younger siblings but the mechanisms at work in MSFW families are unclear. Siblings may be especially influential in MSFW families due to the parents' long work days and the emphasis on sibling caretaking documented in Latino populations. Older siblings may have an increased importance in cultivating necessary school and social skills due to their higher likelihood of having increased English competency and experience in the U.S. school system compared to parents. How siblings may contribute to child development within language (including English language skills), cognitive, socioemotional, and pre-academic domains is of particular interest. In order to begin capturing the influence siblings may have on the preschoolers, the number, age, and English proficiency levels of siblings will be utilized to predict child outcomes. Parents' English fluency, education, and income will also be

accounted for due to their importance in child development. Sibling and parental influence will be compared in relation to child developmental domains to parse out unique contributions of these family members. Furthermore, the current study will also take into account their preschool placement in Migrant and Seasonal Head Start (MSHS) centers. The children's attendance in the MSHS programs, as well as differences between centers, must be evaluated due to preschool's unique influence on children's cognitive, language, socioemotional, and pre-academic domains. Finally, findings must also be interpreted within the broader factors of Latino cultural values and the low-income conditions which affect the vast majority of MSFWs.

Further, it is important to address the confluence model because of its longstanding prominence in family structure and child development research. The confluence model has not yet been examined among MSFW families to see whether child development conforms to the same pattern as it predicts. However, due to the cultural and migratory circumstances that change family dynamics in migrant and seasonal farm worker families, the presence and number of siblings may result in a different pattern of outcomes for very young children compared to the mainstream population in which the model has been researched. This model will be examined in the current study in hope of revealing some of the dynamics to which siblings contribute to MSFW families.

Another key feature of the study will be to examine how siblings may influence their younger siblings' development over time. Siblings may become more influential as children progress in school and perhaps more so than parents. The relationships between siblings and children's initial skills at the beginning of a harvest season versus their skills at the end of the

season have not been explored. This temporal element will help to parse apart siblings' and parents' influence over the course of the season.

In sum, the purpose of this study is to examine how siblings are related to the development of young, Latino children in MSFW families. In order to achieve the above-stated goals the following questions are addressed:

Research Questions:

1. How do the number of siblings in the MSFW family relate to preschoolers' outcomes?
 - a. Is the confluence model applicable to the MSFW population?
In other words, is having more children in the home related to poorer outcomes?
 - b. Are older siblings more beneficial to MSFW children than younger or no siblings?
2. In what ways do the English language proficiency levels of parents and siblings relate to the English language proficiency levels of MSFW children at the beginning and end of the MSHS program?
3. Does the English language proficiency of siblings differentially relate to the preschoolers' English skills at the beginning and end of the MSHS program compared to parents' English language proficiency?

The predictions for the abovementioned research questions are described in the following hypotheses.

Hypotheses:

1. Higher numbers of children in the household will benefit MSFW children on language and socioemotional development but will be detrimental to cognitive skills.
2. Older siblings will be more beneficial to children than no siblings or younger siblings on English language skills and socioemotional domains.
3. Siblings with higher English proficiency will benefit children's English language skills.
4. Siblings' English proficiency will more significantly predict young children's language growth than parents' English proficiency levels. Results for these hypotheses are reported below.

Methods

Participants

Data in this study were collected as part of a larger multi-state early intervention study of agricultural families¹. Participants in this study were preschoolers enrolled in 11 Migrant and Seasonal Head Start (MSHS) centers in Florida, half of whom were participating in the intervention. The total number of preschoolers in the sample was 359 consisting of 194 females (54%) and 165 males (46%). Children's ages ranged from three to five years of age with the average age at the beginning of the season being 48.6 months ($SD=7.75$). There were 86 children who had a sibling in the same classroom. Seventy six percent of the sample was of Mexican descent and spoke Spanish. Mothers' average age was 29 years old

¹ Further details about the intervention and larger study are presented in Barrueco (2012).

($SD=6.66$) and fathers' average age was 32 years old ($SD=6.77$). Additional background information about the children and families is provided in the Results section.

Procedure

Center staff and family service coordinators were trained to conduct child assessments and parent interviews with the MSFW families. Children were assessed on at least two time points using the measures described in detail below. The first time point was at the beginning of the growing season in Florida (approximately October) and the end time point was at the end of the growing season (approximately May). The time span thus covers approximately eight to nine months. Scores at the beginning of the season constitute initial skills with which children came into the program while scores at the close of the season are considered end skills. Children were assessed in the MSHS centers during daytime hours by bilingual staff.

Parent interviews were conducted by family service coordinators at the beginning of the season. Parents were first asked with which language they were more comfortable using during the interview (English or Spanish) with the vast majority of parents choosing Spanish. They were then interviewed about demographic and familial characteristics, along with migratory and Head Start programmatic experiences. They also provided information about their own English language fluency details, as well as that of their families, as further described below. While interviewers attempted to interview both mothers and fathers, approximately 90% of completed interviews were conducted solely with mothers. As some parents were unavailable for interviews, information from 332 parent interviews was available for this study's analytic purposes.

Measures

Direct child assessments were conducted by staff at the MSHS centers. Staff also recorded children's attendance in the program. Measurements utilized in the study are described below.

Learning Accomplishment Profile-Third Edition. The Learning Accomplishment Profile-Third Edition (LAP-3) is a widely-used, comprehensive assessment for young children that measures pre-writing, cognitive, language, self-help, and social/emotional domains of development as well as gross motor and fine motor skills (Hardin & Peisner-Feinberg, 2004). The LAP-3 is a criterion-referenced measure with high internal consistency (.78 to .98), strong correlations with chronological age (.77 to .84) except for a moderate correlation on the personal social scale (.61), an approximate 2 month standard of error around the observed score, and high test-retest correlations (.97 to .99) (Hardin & Peisner-Feinberg, 2004). Scores for the pre-writing scale are determined by children's proficiency at various tasks, such as drawing people and writing their first and last names. The cognitive scale involves tasks such as counting, matching pictures, and demonstrating the understanding of concepts such as "cause and effect." The language subscale assesses narrative and communicative abilities. The self-help scale includes scoring behaviors such as going to the bathroom independently, wiping their own nose, and pouring a drink from a pitcher. Finally, children are observed and scored for interactions with both peers and teachers and if they participate in behaviors such as taking turns in games, following rules, and working in small groups in order to score the personal social scale. LAP-3 assessments were conducted at the beginning and end of the season.

Miami-Dade County Oral Language Proficiency Scale-Revised. Children's English language proficiency was directly assessed with the Miami-Dade County Oral Language proficiency Scale Revised (Miami-Dade County Public Schools, 1999). The Miami Dade English proficiency test is a screening tool that identifies children's level of English language communicative skills. Children are orally tested on expressive and receptive language items. Raw scores are converted into levels of English proficiency. Children are assigned the following categories: 1 = *Novice*, 2 = *Low Intermediate*, 3 = *High Intermediate*, 4 = *Advanced*, 5 = *Independent*. The assessment was conducted at the beginning and end of the season.

Sibling and Family Related Variables. The number of adults and children in the house, number of siblings, siblings' ages, household income, family members' levels of education, and family members' English language proficiencies were gathered from interviews conducted with parents, along with other pertinent demographic data including income that was verified with paycheck stubs. Parents reported English language proficiencies for themselves and siblings using the following 4-point Likert scale: 0 = *not at all*, 1 = *not well*, 2 = *well*, 3 = *very well*. Average sibling English proficiency was calculated based on the parents' reported level of English proficiency for siblings. Siblings of the target MSHS children who were infants during the data collection period were removed from this calculation. A sibling pair was counted if siblings were in the same classroom and data from a randomly chosen sibling in the pair was removed. Parent and sibling levels of education were coded into the following 10 options: 0 = *No education completed*, 1 = *Less than or equal to 4th grade*, 2 = *5th-8th grade*, 3 = *9th grade*, 4 = *10th grade*, 5 = *11th grade*, 6 = *12th*

grade (No Diploma), 7 = *GED*, 8 = *High school graduate/Diploma*, 9 = *Some college*, and 10 = *College degree*. The older sibling variable was recoded into a dichotomous variable where 0 meant the child had only younger or no siblings and 1 meant the child had at least one older sibling.

MSHS Center Variable. The MSHS centers throughout Florida were each assigned codes from 1 to 11. Each child was designated as attending a specific center. Centers may vary in numerous ways including teacher quality and the neighborhood in which the center is located. The differences between the centers may influence how children are taught or learn and may influence the developmental domains of interest. The MSHS center category was used as the second level variable in the hierarchical linear modeling analyses described in the next section.

Data Analyses

Due to the nested nature of the data (children nested within centers), hierarchical linear modeling (HLM) was utilized to illuminate the relationship between child cognitive, social, pre-writing, and language development and family and sibling characteristics. HLM allows for the estimation of variance created at multiple levels of analysis. In this study, HLM helped to capture the variance in between centers and control for how much that variation influences child outcomes. Models including the above variables were tested for children's initial skills at the beginning of the season (Initial Skills Models) and children's ending skills at the close of the season (Autoregressive Models). Analyses were conducted using HLM version 6.08 software.

Prior to conducting advanced statistical analysis, it is crucial to run descriptive statistics and basic analyses to obtain a general understanding of the sample and to critically examine the functioning of the study variables. For example, such analyses are used to test whether the necessary assumptions of the planned analyses are met, as well as to understand the interrelatedness of the variables. The latter included a series of correlations, ANOVAs, and regressions to identify which background variables should be included as covariates. The following variables were included as covariates due to their interrelationship with most of the dependent variables and due to their identification through extant child development research as strong influences on early developmental outcomes, particularly for Latino immigrant children: household income, parent education, number of parents in the home, child's gender, child's age, program attendance, and child's initial language skills. All descriptive and basic analytic procedures were conducted in the Statistical Package for Social Sciences (SPSS) version 17.

Results

Summary of Sample

The total number of MSHS children in the sample was 359 (54% female) with the average age being 48.6 months ($SD=7.75$) at the beginning of the season. Table 1 displays demographic information for children, parents, and siblings.

Families were below the federal poverty line of \$22,050 for a family of four (US Department of Health and Human Services, 2009) as the sample's average income was \$15,942.86 ($SD=\$5,790.19$). Over 70% percent of homes were described as "two parent"

households. Fathers had slightly lower education levels on average than mothers (5th-8th grade versus 9th grade, respectively).

The average number of household members was 4.36 ($SD=1.5$). About 19% of the sample was single children. The average number of siblings for the target child was 1.66 ($SD=1.3$). Fifty four percent of the sample had older siblings. The average age of siblings was 5.90 years of age ($SD=4.40$ years) although there was a large range of sibling ages from newborn to 29 years of age. Siblings' average level of education for was 1.38 ($SD=.89$) with most siblings enrolled in 4th grade or lower grades.

Average mothers', fathers', and siblings' English fluencies equate to "not well" on the 4-point Likert scale. Mothers had the lowest reported average English proficiency ($M=0.82$, $SD=1.02$), fathers were next highest ($M=0.88$, $SD=0.88$), and siblings had the highest average English fluency ($M=1.11$, $SD=0.99$). The family members' fluencies are all significantly correlated at the $p<.01$ level. Paired-sampled t-tests showed the mothers' and fathers' fluencies were not significantly different from each other ($t(257)=-1.21$, $p=.229$). However, siblings' average fluency was significantly different from fathers' fluency ($t(195)=2.77$, $p<.01$). In addition, siblings' average fluency was significantly different from mothers' fluency ($t(253)=3.06$, $p<.01$).

Additionally, Table 1 displays mean scores and standard deviations for LAP-3 domains and the Miami Dade English Proficiency test. Variation in the total number of assessments was due to absences at the time of assessment or family migration before assessments were conducted. Children's average developmental ages on the LAP-3 domains were as follows: 49.69 months ($SD=9.71$) for prewriting skills, 46.03 ($SD=8.93$) for cognitive

skills, 44.85 ($SD=8.81$) for language skills, and 52.36 ($SD=13.84$) for personal/social skills. As children's average age was 48.6 months ($SD=7.75$), this shows that cognitive and language initial scores are slightly below average for the age group. However, pre-writing and social skills are at age-appropriate levels. Children scored on average in the Low Intermediate range for English language proficiency on the Miami-Dade test.

Relationships between Variables

Correlations were conducted on both dependent and independent variables in order to determine their relationships to each other. All LAP-3 and Miami-Dade scores were significantly related to each other below the .01 significance level with correlations ranging from .46 to .93 (see Table 2 for the complete results).

Table 3 displays the correlations between the predictors and child outcome scores. Mothers' and siblings' English fluencies were related to children's Miami-Dade scores but not LAP-3 scores. Fathers' English fluency was not related to any outcome measures. Children's age was related to all outcome scores. Children's gender was related to all scores except beginning and ending LAP-3 cognitive scores and beginning LAP-3 language scores. Attendance was related to all LAP-3 scores but not Miami-Dade Scores. Covariates for the full models included child age, child gender, family income, and child's attendance at the MSHS center and are described as appropriate below.

Hierarchical Linear Modeling (HLM)

Hierarchical Linear Modeling (HLM) was utilized because intra-class correlations (ICC) were significant, indicating other statistical programs may misestimate error and lead to less accurate findings. For example, at the beginning and the end of the program, Miami-

Dade scores showed significant center-level variability, 13% for pre scores and 5% for post scores. At initial testing, LAP-3 subscale scores did not show significant center-level variability. However, by the end of the program all LAP-3 subscale scores showed significant center-level differences. The LAP-3 Language ICC was .07 which indicates 7% of variability in end scores was due to center level variation. The other three scales, Cognitive, Personal/Social, and Pre-Writing all had 16% of variability in scores due to center level variation (see Table 4 for complete results).

Thus, the hypotheses were analyzed using a series of hierarchical linear regressions to examine the contributions of child and family variables in predicting child outcomes, accounting for center-level effects. Each MSHS center had an average of 33 children attending the program ($SD=9.95$). There were two overarching models testing siblings' influence on children's scores. First, the influence of siblings on children's skills at the outset of the program was tested by using children's beginning scores. Second, beginning scores were controlled for in order to predict end scores to examine the influence of siblings over the length of the MSHS program which accommodated the harvest season (9 months). This approach will help to identify if siblings and/or parents differentially influenced child outcomes over the course of the program. Based on these analyses, the final models are displayed in Tables 5 through 8.

Hypothesis 1. It was expected that higher numbers of children in the household would benefit MSFW children on language and socioemotional development but would be detrimental to cognitive skills. However, the models did not support this hypothesis.

Initial skills model. As presented in Table 5, the first set of models controlled for child age, child gender, child attendance in MSHS, family income, and beginning language scores (except when predicting language scores) while testing the influence of the number of children in the household on initial skills. The number of children in the household did not have a significant relationship to any of the children's outcomes. Interestingly, the results also do not support the confluence model which would predict a significant negative relationship between number of children and cognitive skills.

Autoregressive model. The second set of models examined end scores while accounting for initial scores, child gender, family income, and beginning language scores. The results showed no significant effects for the number of the children in the household on outcomes. This finding indicates that the number of children in the household did not significantly influence children's developmental progress over the length of the program.

Summary. Hypothesis 1 predicted that the MSFW families would conform to the confluence model for cognitive skills, which predicts more children in the home to be linked with lower cognitive scores. However, it was also predicted that more children in the home may benefit MSFW children's language and socioemotional skills. The hypothesis was not supported because the number of children in the home did not appear to significantly impact these developmental domains in a positive or negative direction (see Table 5).

Hypothesis 2. The hypothesis that older siblings would benefit children's development more than younger or no siblings was not supported.

Initial skills model. Similar to hypothesis 1, the first set of models controlled for child age, child gender, child attendance in MSHS, family income, and beginning language

scores (except when predicting language scores) while testing the influence of older siblings versus younger and no siblings on children's initial skills (see Table 6). The model did not show a significant influence of the presence of older siblings on developmental domains when accounting for the covariates. It was noted that the Miami-Dade beginning scores were trending toward significance ($p=.055$), when covariates were not in the model.

Autoregressive model. Again, the second set of models predicted end scores while accounting for beginning scores, child gender, family income, and beginning language scores. The results did not show evidence of a significant effect for the presence of older siblings in the household on cognitive, language, pre-writing, socioemotional, or English proficiency outcomes. Therefore, having older siblings did not significantly influence children's scores in these areas over the length of the program as displayed in Table 6, when including covariates. Without the covariates, Miami-Dade end scores were significantly predicted by the category of siblings ($p=.03$).

Post hoc analyses. Post hoc analyses were run to further examine the influence of older siblings in families where parents had lower English fluency. The households that had the bottom two categories of English proficiency were analyzed to determine if older siblings may have a more extensive role in helping younger children develop. Overall, no evidence was found in these homes for most outcomes, except for a trend in the growth of English proficiency skills ($t(267)=1.86, p=.06$).

Summary. Hypothesis 2 predicted that the presence of older siblings would have a positive influence on young children's developmental domains. Overall, this hypothesis was not supported as the presence of older siblings did not significantly relate to children's

cognitive, language, prewriting, socioemotional, or English proficiency skills in the full initial skills or autoregressive models. When covariates were not included in the models, there is some indication that the presence of older siblings may impact young children's initial English language skills and growth of these skills over time.

Hypothesis 3. It was predicted that siblings with higher English proficiencies would benefit children's English language skills. The hypothesis was supported in the initial skills and autoregressive models.

Initial skills models. Average sibling English proficiency significantly related to children's English language skills at program entrance after accounting for age, gender, beginning language skills, and income, ($T(10,149) = 4.169, p < .01$; see Table 7). The standardized beta coefficient for sibling English language skills and its relation to target children's Miami-Dade scores at program inception was 0.36 ($p < .01$).

Autoregressive model. Average sibling English fluency was also significantly related to children's scores in English skills over the program period when controlling for beginning scores, income, and attendance, ($T(10, 153) = 2.226, p = 0.03$). However, sibling fluency became a trend when the child's gender was entered into the model ($p = 0.098$), with girls performing better on the Miami-Dade than boys. See Table 5 for all models.

Post hoc analyses. In order to parse apart older sibling effects, post hoc analyses were run on children who only had older siblings then the average English proficiency was calculated for the older siblings. Average older sibling(s)' proficiency was found to positively influence the preschoolers' English proficiency at the beginning of the program

($t(179)=4.83, p<.001$) ($n=109$) but did not significantly predict growth over the program ($t(178)=1.122, p=.26$), when controlling for initial English proficiencies.

Summary. Hypothesis 3 predicted that siblings with higher English proficiencies would positively influence young children's English language skills. The hypothesis was supported in initial and growth skills models as siblings' English skills significantly predicted children's English language skills. When examining the age of siblings, older siblings' English skills significantly predicted initial English language scores but not progress in English skills over time.

Hypothesis 4. Finally, siblings' English proficiencies were anticipated to be more predictive of young children's English language growth than either parents' English proficiency levels. The hypothesis was supported completely for fathers and partially for mothers as seen in Table 8.

Siblings' and fathers' initial skills and autoregressive models. Although caregivers' English proficiencies are highly correlated ($r=.49, p<.01$) and fathers have a higher average English proficiency than mothers, fathers' English proficiency is not predictive of child outcome scores either at the outset or at the end of the program.

Siblings' and mothers' initial skills and autoregressive models. Unlike fathers, siblings' and mothers' English proficiencies are significant for children's scores at the beginning of the program with siblings being slightly more influential than mothers, $\beta = 0.311, p<.01$ and $\beta = 0.221, p=.01$, respectively (see Table 8). Interestingly, as siblings' English fluency continues to be significant in relation to children's growth while in the

program ($t(125)=2.111, p=0.04$), mother's English fluency no longer predicts child fluency outcomes over time when gender and attendance were not covariates ($t(125)=1.305, p=0.19$).

Summary. Hypothesis 4 predicted that siblings' English fluency would be more influential than parents' regarding the development of young children's English language skills. This hypothesis was mostly supported. Siblings' English proficiency predicted children's English skills more than fathers' English proficiency in initial and autoregressive models. Siblings' and mothers' English levels predicted children's initial English skills; however, siblings' English proficiency predicted children's English language growth more strongly than mothers' English levels.

Discussion

Farm working and migratory life elicit a set of intense stressors for workers and their families. Some of the hardships these families endure include long hours of manual labor, extremely low wages, poor living conditions, and inconsistent educational opportunities for children. Stressors experienced by migrant and seasonal farm worker (MSFW) families are often compounded by acculturative processes (e.g., learning English) for this predominantly immigrant population. The sample in this study primarily consisted of Spanish-speaking participants of Mexican descent. These families tended to include two parents with two or more children living below the poverty line. The complexity of the families' circumstances and the field's current lack of knowledge about MSFWs warrant specialized attention from researchers and policy makers. We specifically need to examine family dynamics in these distinct communities as they may function differently than as expected for mainstream U.S. culture, as reviewed in the introduction. Research findings about these families could inform

clinicians, educators, and other service providers on how to optimize care for this heavily stressed population. Further, public policies, interventions, and educational programs may need to be modified in order to meet the needs of MSFW workers and their children.

The specific purpose of this study was to investigate how siblings relate to the development of preschoolers in MSFW families. To date, the MSFW population has been largely unstudied. Previously conducted studies have not incorporated both cross-sectional and longitudinal data which are necessary to understand the current status and functioning of children and how they develop over time. In addition, the current study is able to account for differences that may occur between children who attend different Migrant and Seasonal Head Start (MSHS) centers, which is of statistical and theoretical benefit. MSHS centers may differ from each other due to neighborhood factors (e.g., community demographics, income, crime, housing) which, in turn, affect children's development. These center based variations remain largely unnoticed in research, which can contribute to inaccurate conclusions. Center-level variations were indeed found in the current study and taken into account in analyses. Controlling for these variations, referred to as "center-level effects," is integrated into the analytical approach utilized in this study, specifically hierarchical linear modeling (HLM). These analyses allow researchers to account for variability that affect children's development and to what extent at not only the individual child-level but also at the center-level.

Prior to this investigation, no studies had ever examined sibling variables within this population and for the young age range considered. Non-parental family members, such as siblings, are often neglected in research despite literature that notes their importance in family functioning (East, 2009). Latino siblings may be even more integral to families as

they take on additional care giving responsibilities toward younger siblings (Hafford, 2009). Older siblings' influence on young children, especially at critical stages of development such as in preschool, needs clarification.

The present study aimed to fill in some of the aforementioned gaps in knowledge around siblings in MSFW families. Hypotheses were designed to explore how siblings may be more directly involved in young children's skill development. For example, the presence of more children in the family was predicted to be related to lower general cognitive skills for preschoolers when compared to the presence of fewer children in the home, as suggested by the confluence model. In addition, it was posited that that some skills, such as language and personal/social skills, might benefit from having more siblings in the household. Specifically, it was expected that preschoolers' higher English language skills would be related to having more siblings in the home who were school-aged or older. Lastly, siblings' English language skills were expected to be more influential than parents' skills on preschoolers' English proficiencies.

This study evidenced that the total number of children in the MSFW home, as well as number of older siblings, did not significantly relate whether positively or negatively to many developmental domains of interest for preschoolers, including cognitive, general language, pre-writing, and social skills. The one exception to this pattern was regarding English language skills. The relationship between siblings' English proficiency with both preschoolers' beginning English skills and growth of skills over the length of the program were robust. When siblings were reported to possess higher English fluency, MSFW preschoolers scored better on English language measures compared to peers with siblings

who had less overall proficiency in English. Older siblings were particularly associated with preschoolers' higher English language skills.

Understandably, older siblings tend to have more education and higher English fluency due to their enrollment in U.S. schools compared to their younger siblings. Due to the young age of the study's sample (preschoolers), younger siblings are most likely toddlers possessing lower language skills overall. Most likely, older siblings speak English at home with siblings and so provide young children with opportunities to hear and/or practice English. Therefore, MSFW siblings may play an important role in helping very young children learn English language skills before and during formal schooling.

Findings for MSFW parents differed from siblings regarding preschoolers' English language skills over time. Mothers' English fluency and siblings' English fluency were similarly significant in relation to preschoolers' English skills at program enrollment. That is, at the beginning of the program, both mothers and siblings were important in preschoolers' English proficiency. However, siblings surpassed mothers' influence on preschoolers' English skills by the end of the program when gender and attendance were removed from the model. Interestingly, when siblings were compared to fathers regarding the preschoolers' English skills, siblings' English fluency was significantly influential while fathers' fluency was not statistically significant at the beginning or throughout the program. The findings suggest siblings differentially relate to preschoolers' English skills to an even greater extent than parents. Siblings' role in the English development of MSHS preschoolers may be more influential than their parents' because parents have limited English skills and spend exorbitant amounts of time working in the fields. Siblings, on the other hand, are increasing

in their levels of English fluency and overall education and spend large amounts of time with younger siblings. In fact, parental education level was not significantly correlated to children's outcome measures at all. This finding may in part be due to the small range of educational achievement by parents in this sample. However, the implications should be further explored.

The present study's results question the overall applicability of the confluence model for this population. The prediction of the confluence model that more children in the house negatively affect younger children's outcomes, especially cognitively, was not supported. The confluence model expects that the intellectual environment in a bigger family is less stimulating compared to a small family; this does not seem to be an accurate portrayal of MSFW families. Other theories that explain why bigger families are detrimental to children's outcomes are also found wanting for the current sample since the phenomenon is not present universally. For example, the resource dilution theory proposes that adult attention and financial resources are segmented into increasingly smaller portions with the addition of each child, which would typically result in the youngest children from big families achieving lower scores on intellectual tests. However, in MSFW families, siblings may not significantly affect the amount of distribution of resources to each child since there are few available financial means in the first place. Therefore, the same process of dividing parental resources in the resource dilution theory, or watering down the intellectual environment as described in the confluence model theory, may not be occurring in MSFW families. Instead, due to long, intense work hours and low income levels of parents, there may be less attention and material

resources to give any of the children; as such, differences between the numbers of children could be minimal.

Empirical support for this assertion was indicated by the social, pre-writing, and language outcomes, where no significant influence from the number of children in the household was found in a positive or negative direction. Constraining analyses to preschoolers who only had older siblings did not change the results, implying that there was not an association between being the youngest child in a small or large family and outcomes as predicted from the confluence and resource dilution theories. Alternatively, MSFW siblings may be providing interpersonal resources such as attention and individualized learning opportunities that typically come from parents and so counteract some of the negative impact seen in other populations' big families. As a result, the current study supports the broader notion that there are processes occurring in the MSFW population differentially from mainstream populations.

Beyond mainstream populations, it is important to note that MSFW families differ in key ways from other Latino populations in the United States as well. Ortiz (2009) examined language and literacy skills in Latino preschoolers in Head Start, and found that children from larger families were at a disadvantage in most domains, in contrast to the result from the present MSFW investigation which found no differences between family sizes. The only exception from both Ortiz and the present study is with regards to English language skills. Both studies found older siblings are associated with better English language scores for preschoolers. On the other hand, Ortiz partly rejected the confluence model because children from 2-parent homes scored lower on language and literacy outcomes compared to children

from single parent homes. The confluence model predicts that more adults in the home raise the intellectual environment and so should result in better outcomes for children. The current sample had few instances of single parent homes in order to compare results on this particular point. Although the contrasting results between these two samples of low-income, Mexican-descent populations may be surprising due to their similarities, the results indicate there are unique factors of migrant farm workers' lives that make them diverge from functioning like other demographically similar Latino populations. For example, the MSFW families have higher rates of immigrant status at 75% compared to the national average for Latinos which is 37% (U.S. Census Bureau, 2010). In addition, they may live in homes without running water and electricity, which make seemingly simple daily tasks difficult and lengthy endeavors reducing the amount of time available for adult and child interaction. The amount of time and language used in verbal interactions between adults and children and between siblings is unclear. Results in the current study indicate that siblings may be taking a lead role in talking to the preschoolers in English, but these relationships and familial interactions need further investigation.

Conclusion

Caretakers and siblings may play distinct roles in the development of MSFW preschoolers' English language skills, especially as siblings develop English proficiencies which exceed that of their parents. Therefore, siblings may not only be critical in caretaking of younger siblings, as often documented in research on Latino families (e.g., East, 2009; Hafford, 2009), but they may help with the acculturative process of learning English. The aid siblings provide in English language skills to preschoolers may lead to higher educational

achievement. Research has shown that learning English along with the full development of the child's first language is beneficial for educational and occupational achievement (Reese et al., 2008; U.S Department of Education, 2008). Better education for MSFW children and other underserved populations is also beneficial to society as a whole economically (Natriello, McDill, & Pallas, 1990). In fact, Hernandez, Denton, & Macartney (2009) posit that "If they can maintain and develop their bilingual skills, these children represent an enormous potential resource for building connections throughout the world" (p. 629).

Since early education is known to be extremely important for later academic development (e.g., Gormley, Gayer, Phillips, & Dawson, 2005; Puma et al., 2005), Migrant and Seasonal Head Start programs and other preschools may help their young attendees by incorporating siblings into the curriculum or offering services to siblings in addition to parents. Currently, there are programs at some Migrant and Seasonal Head Start centers to help parents learn English and improve literacy skills, but it may be more impactful if the programs also include siblings. Such efforts would further the empirically supported family literacy approach (van Steensel, McElvany, Kurvers, & Herppich, 2011; Wasik, & van Horn, in press). Early intervention plans can then optimize the potential of all the family members, which would be in line with the deeply embedded cultural values of this population.

Finally, the implications of any study must be seen through the cultural lens appropriate to the sample. In the current study, conclusions must be drawn in light of strongly held cultural values in the vastly Latino MSFW population. For example, *familismo* is a powerful principle associated with Latino families that encourages strong, warm relationships and may contribute to the interactions between siblings (Halgunseth, Ispa, &

Rudy, 2006; Sabogal, Marin, Otero-Sabogal, Marin & Perez-Stable, 1987). Additionally, similar to national Latino family trends, MSFW families maintain high rates of two-parent households. Due to the migratory lifestyle, MSFWs may not travel with extended kin such as grandparents, aunts, and uncles, who often play highly involved roles in typical Latino families. Close, familial relationships are a critical component for the resiliency of this population in the face of difficulties (Fuller & García Coll, 2010). Therefore, MSFW families may be at a greater disadvantage than other Latino communities who can draw from a larger support system. MSFW families need to be understood in the appropriate cultural and contextual framework of their complex lifestyle which is just beginning to be examined.

Limitations

Some limitations of the present study should be noted. First, due to the migratory nature of the sample, tracking and following-up with families can be difficult. Nineteen percent of the children dropped out of the program before the end of the season assessments mostly due to mobility. Nevertheless, sample sizes in the present investigation are large for MSFW research, which helps to substantiate findings.

Secondly, within-family data analyses, such as birth order or the individual effects of each sibling on the target child, would be useful in the investigation of MSFW families and theories such as the confluence model. For example, adding the variables of age, gender, and gap in age between each sibling and the preschooler may illuminate how these variables are influential in development.

Thirdly, direct sibling measures in cognitive and language domains that corresponded to the preschoolers' measures would have allowed for stronger conclusions. The current

study used sibling data reported by parents. Although this valid method is used throughout the literature (e.g., Chao & Kanatsu, 2008; Edelbrock, Costello, Dulcan, Conover, & Kala, 1986), it did not allow for continuous score analysis or direct comparisons within families. Future research must include these measures to expand upon our conclusions.

Finally, it would be helpful to have more data on center-level variables in order to understand the differences between MSHS programs. For example, data on neighborhood factors would allow explanation of the center-level variability found in the present study's HLM models. The current study found that there are significant differences between centers and children enrolled at various centers differed in developmental domains. However, there was not enough neighborhood data to pinpoint the particular variables responsible for the disparities. Although no other studies in this field have accounted for center-level variability to date, a better understanding of the centers would enhance the models' ability to identify multiple levels of influence on child development.

Future Directions

As this study is the first to look at sibling variables in MSFW families, more research is needed to deepen our understanding of the role these vital family members play. Any investigations into this complex population should be couched in a theoretical framework that allows for multidimensional approaches like the ecocultural theory. Future studies could expand the literature on siblings in MSFW families by examining the relationship quality between siblings. Relationship quality has been shown to be important in children's development in many populations including young, Latino children through adolescence (Modry-Mandell, Gamble, Taylor, 2007; Updegraff, McHale, Whiteman, Thayer, &

Delgado, 2005). Siblings' relationships may be even more important in MSFW families as they move often and may not have typical long-term friendships with peers.

Finally, due to the contrary nature of the results to the confluence model and the general phenomenon of children from bigger families displaying less achievement, more studies focusing on siblings should be conducted and expanded with multi-method assessment and longitudinal designs within MSFW families. Sibling influence may change over time and throughout various stages of development.

The research on MSFW families continues to be in its preliminary stage partly since this population is difficult to reach and track. However, effort must be put forth to understand and help these families who face intense and serious challenges such as poverty, poor living conditions, and cultural isolation. These factors will undoubtedly affect how the families function within themselves, in the community, and how they interface with the broader context of U.S. culture. The unique, multi-faceted approach of this study helps to elucidate some of these families' characteristics. However, the need for a better understanding of these families and home environments is critical to the healthy development of their young children and to the benefit of the society in which they join.

Table 1

Summary of Sample Characteristics

Variable	N	Mean	SD
Child			
Age (months)	239	48.64	7.75
English Proficiency	351	0.80	0.82
Number of siblings	359	1.66	1.32
Attendance at MSHS (days)	355	87.68	25.91
Gender	359	194 (54% female)	--
Family			
Income	356	\$15,942.86	\$5,790.19
Maternal Education	338	2.83 (about 9 th grade)	2.27
Paternal Education	252	2.52 (about 8 th grade)	1.79
Maternal Age (years)	355	29.26	6.66
Paternal Age (years)	264	31.69	6.77
Mother's reported English proficiency	353	.82 (not at all-not well)	1.02
Father's reported English proficiency	260	.88 (not at all-not well)	.88
Number of Household members	356	4.36	1.50
Number of Adults in Household	356	1.72	0.45
Number of Children in Household	356	2.67	1.30
Sibling			
Age (years)	292	6.05	4.56
English Proficiency	257	1.11 (not well-well)	0.99
Level of Education	154	1.38 (4 th grade or less)	.89
Raw Scores			
LAP-3 Pre-writing Beginning	238	20.37	7.51
LAP-3 Pre-writing End	214	29.21	7.05
LAP-3 Cognitive Beginning	238	30.57	14.95
LAP-3 Cognitive End	214	47.64	16.66
LAP-3 Language Beginning	238	30.71	12.61
LAP-3 Language End	214	42.07	13.62
LAP-3 Personal/Social Beginning	238	28.99	10.91
LAP-3 Personal/Social End	214	37.65	8.33
Miami-Dade English Fluency Beginning	272	2.04 (Low Intermediate)	1.32
Miami-Dade English Fluency End	224	3.09 (High Intermediate)	1.36

Table 2

Correlations between Scores on Outcome Variables

	Miami- Dade Beginning	Miami- Dade End	LAP-3 Pre- Writing Beginning	LAP-3 Pre- Writing End	LAP-3 Cognitive Beginning	LAP-3 Cognitive End	LAP-3 Language Beginning	LAP-3 Language End	LAP-3 Personal/ Social Beginning	LAP-3 Personal/ Social End
Miami-Dade Beginning	1	.696**	.590**	.487**	.607**	.577**	.608**	.582**	.544**	.456**
Miami-Dade End	.696**	1	.633**	.516**	.618**	.564**	.604**	.590**	.586**	.465**
LAP-3 Pre- Writing Beginning	.590**	.633**	1	.765**	.884**	.754**	.827**	.776**	.859**	.679**
LAP-3 Pre- Writing End	.487**	.516**	.765**	1	.706**	.852**	.738**	.852**	.713**	.878**
LAP-3 Cognitive Beginning	.607**	.618**	.884**	.706**	1	.805**	.917**	.819**	.890**	.640**
LAP-3 Cognitive End	.577**	.564**	.754**	.852**	.805**	1	.795**	.925**	.731**	.815**
LAP-3 Language Beginning	.608**	.604**	.827**	.738**	.917**	.795**	1	.872**	.852**	.689**
LAP-3 Language End	.582**	.590**	.776**	.852**	.819**	.925**	.872**	1	.776**	.803**
LAP-3 Personal/ Social Beginning	.544**	.586**	.859**	.713**	.890**	.731**	.852**	.776**	1	.717**
LAP-3 Personal/ Social End	.456**	.465**	.679**	.878**	.640**	.815**	.689**	.803**	.717**	1

*significant at the 0.05 level (2-tailed)

**significant at the 0.01 level (2-tailed)

Table 3

Correlations between Predictors and Outcome Variables

	Child's Gender	Child's age at 1st LAP (calculated in months)	Mother/Mother Figure's English Fluency	Father/Father Figure's English Fluency	Number of Children in Household	Income amount	Number of Days Attended	Average Sibling English Fluency	Older sibling category ^a
Miami Dade Scores									
Beginning Score	-.172**	.568**	.161**	.033	.007	-.005	.098	.234**	.036
End Score	-.195**	.548**	.169*	.124	.019	.099	.130	.236**	.121
LAP-3 Subscale Raw Scores									
Pre-Writing - Beginning	-.161*	.818**	-.030	-.094	-.008	.090	.207**	.051	-.016
Pre-Writing - End	-.216**	.619**	-.048	-.080	.007	.113	.286**	-.016	-.004
Cognitive - Beginning	-.091	.892**	-.016	-.079	.006	.108	.155*	.025	-.018
Cognitive - End	-.110	.666**	-.008	-.048	-.015	.147*	.294**	.034	.017
Language - Beginning	-.105	.826**	.033	-.061	-.008	.057	.182**	.039	.011
Language - End	-.155*	.714**	-.019	-.077	.008	.120	.283**	.053	.028
Personal/Social - Beginning	-.140*	.839**	-.045	-.099	.035	.110	.167**	.012	.008
Personal/Social - End	-.137*	.576**	-.043	-.024	.027	.052	.278**	-.031	.040

*significant at the 0.05 level (2-tailed)

**significant at the 0.01 level (2-tailed)

^a Does the child have older siblings? Yes=1 No=0

Table 4

Intraclass Correlations for Outcome Measures

	Intraclass Correlations (ICC)	
	Beginning Scores	Ending Scores
Miami-Dade	.13*	.05*
LAP-3 Pre- Writing	.02	.16***
LAP-3 Cognitive	.02	.16***
LAP-3 Language	.01	.07**
LAP-3 Personal/Social	.02	.16***

*significant at the 0.05 level (2-tailed)

**significant at the 0.01 level (2-tailed)

***significant at the .001 level (2-tailed)

Table 5

HLM modeling results: Impact of number of children in household on development in migrant and seasonal farm worker preschoolers

	Initial Skills Model					Autoregressive Model				
	Cognitive	Language	Pre-Writing	Personal/Social	English Proficiency	Cognitive	Language	Pre-Writing	Personal/Social	English Proficiency
Number of children in household	-.19 (.42)	-.08 (.22)	-.12 (.21)	.05 (.25)	-.01 (.02)	-.11 (.60)	.04 (.43)	.09 (.17)	.26 (.23)	-.02 (.05)
Beginning skill level	---	---	---	---	---	0.54 (.09)***	.88 (.07)***	.45 (.10)***	.31 (.11)**	.58 (.08)***
Family income	<.01 (<.01)	<.01 (<.01)	<.01 (<.01)	<.01 (<.01)**	<.01 (<.01)	<.01 (<.01)*	<.01 (<.01)*	<.01 (<.01)	<.01 (<.01)	<.01 (<.01)*
Attendance	---	---	---	---	---	.19 (.04)***	.12 (.02)***	.05 (.02)*	.09 (.04)*	.01 (.01)
Child gender	-0.30 (.61)	-2.04 (.71)**	-1.61 (.54)**	-1.44 (.73)*	-.15 (.19)	-.87 (1.23)	-2.08 (.59)**	-1.67 (.54)**	-0.71 (.71)	-.30 (.17)
Age	.83 (.13)***	1.36 (.09)***	.46 (.08)***	.60 (.13)***	.04 (.01)**	---	---	---	---	---
Beginning language skills	.66 (.08)***	<i>presented above</i>	.25 (.05)***	.42 (.07)***	.04 (.01)***	.36 (.09)***	<i>presented above</i>	.15 (.05)**	.18 (.06)**	.02 (.01)***

Values are unstandardized regression coefficients with standard errors in parentheses.*p < .05;**p < .01; ***p < .001

Table 6

HLM modeling results: Older sibling(s)' influence on development in migrant and seasonal farm worker preschoolers

	Initial Skills Model					Autoregressive Model				
	Cognitive	Language	Pre-Writing	Personal/Social	English Proficiency	Cognitive	Language	Pre-Writing	Personal/Social	English Proficiency
Having older sibling(s)	-.97 (.90)	1.30 (1.09)	-.48 (.59)	-.06 (.62)	.24 (.19)	.95(1.41)	.38 (.91)	.41 (.59)	1.14 (.76)	.27(.15)
Beginning skill level	---	---	---	---	---	0.55 (.09)***	.88 (.03)***	.46 (.11)***	.32 (.06)***	.58 (.08)***
Family income	<.01 (<.01)	<-.01 (<.01)	<.01 (<.01)	<.01 (<.01)**	<.01 (<.01)	<.01 (<.01)	<.01 (<.01)*	<.01 (<.01)	<-.01 (<.01)	<.01 (<.01)
Attendance	---	---	---	---	---	.20 (.04)***	.12 (.03)**	.05 (.02)*	.09 (.03)**	.01 (.01)
Child gender	-.28 (.61)	-2.02 (.73)**	-1.60 (.55)**	-1.44 (.73)*	-.14 (.20)	-.85 (1.23)	-2.08 (.87)*	-1.67 (.57)**	-.71 (.73)	-.29 (.16)
Age	.82 (.12)***	1.36 (.09)***	.46 (.08)***	.60 (.13)***	.05 (.02)**	---	---	---	---	---
Beginning language skills	.66 (.08)***	<i>presented above</i>	.26 (.05)***	.42 (.07)***	.04 (.01)***	.34 (.10)***	<i>presented above</i>	.15 (.05)**	.32 (.06)***	.02 (<.01)***

Values are unstandardized regression coefficients with standard errors in parentheses.*p < .05;**p < .01; ***p < .001

Table 7

HLM modeling results: Sibling(s)' English Proficiency influence on English Proficiency in migrant and seasonal farm worker preschoolers

	Initial Skills Model	Autoregressive Model
	English Proficiency	English Proficiency
Sibling(s)' Average English Proficiency	.36 (.09)***	.10 (.07)
Beginning skill level	---	.54 (.08)***
Family income	<-.01 (<.01)	<-.01 (<.01)
Attendance	---	<-.01 (.01)
Child gender	-.07 (.18)	-.30 (.19)
Age	.05(.02)*	---
Beginning language skills	.04 (.01)***	.02 (.01)***

Values are unstandardized regression coefficients with standard errors in parentheses.

*p < .05; **p < .01; ***p < .001

Table 8

HLM modeling results: Sibling(s)' English Proficiency influence on English Proficiency in migrant and seasonal farm worker preschoolers compared to caretakers

	Mother		Father	
	Initial Skills Model	Autoregressive Model	Initial Skills Model	Autoregressive Model
Sibling(s)' Average English Proficiency	.31(.08)***	.09(.07)	.35 (.07)***	.06(.10)
Mother's English Proficiency	.22(.09)*	.11(.08)	---	---
Father's English Proficiency	---	---	.09(.12)	.15(.13)
Beginning skill level	---	.52(.09)***	---	.51(.12)***
Family income	<.01(<.01)	<.01(<.01)	<.01 (<.01)	<.01(<.01)
Attendance	---	<.01(<.01)	---	<.01(.01)
Child gender	-.07(.16)	-.31(.20)	.15(.18)	-.41(.21)*
Age	.05(.02)*	---	.06(.02)**	---
Beginning language skills	.03(.01)**	.03(.01)***	.04(.01)***	.02(.01)*

Values are unstandardized regression coefficients with standard errors in parentheses. *p < .05; **p < .01; ***p < .001

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