THE IMPRINT OF ABSENCE

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This dissertation examines the heterogeneity among immigrant children in the United States. Given the global demand for female labor from developing countries, that many of these families are poor and cannot afford to migrate together, and that once separated reunification is further prolonged by immigration policies, many immigrant children are separated from a primary caregiver for some portion of their development. This dissertation project compares the developmental outcomes of three groups of Caribbean immigrant children, one group of first-generation children who migrated with their mothers (family migration), another group of first-generation children who were separated from their mothers due to migration (separated migration), and a third group of second-generation children. Studying maternal separation in immigration illuminates an important context in which child development occurs for some immigrant children. Drawing support from the research on adverse childhood experiences, like childhood poverty, it is hypothesized that different immigration ecologies will engender different parent-child relations, mental health outcomes, and cognitive abilities. Chapter two examines the attachment patterns of Caribbean immigrant adolescents and establishes a link between maternal separation in immigration and attachment anxiety. Chapter three explores the role of attachment security and parenting styles on the mental health of Caribbean immigrant youth. The results of this paper show that attachment security fully mediates the link between immigration experiences and mental health outcomes. Chapter four proposes executive function as a potential explanatory variable for

the academic disparities observed among immigrant youth. Results show that children from the family migration group report better cognitive flexibility than the other two groups. Results also show that parental involvement positively and significantly impacts executive function abilities. Together, this dissertation provides evidence that maternal separation due to immigration is associated with some adverse child development outcomes. The findings from this project are useful to families, educators, and policy-makers as work together to support this population.

BIOGRAPHICAL SKETCH

Rochelle Coretta Cassells was born in Saint James, Jamaica and raised in Trelawny, Jamaica and Barnegat, New Jersey. She attended Temple University where she majored in Psychology and minored in French and Political Science. Rochelle was positive she would work for the United Nations Development Program after university, but once she was introduced to the bioecological systems theory, she knew she had found her place in Psychology. Rochelle attained a fellowship with the National Institutes of Health during her sophomore year which allowed her to pursue an independent research project at Cornell University as a rising senior. She worked with her advisor, Dr. Gary Evans, for the first time during the summer of 2011 and the experience crystallized her desire to pursue a graduate degree. In fall 2012, she began her graduate studies in the department of Human Development at Cornell University. While at Cornell, Rochelle served as Graduate Resident Fellow (GRF) in both Carl Becker House and Alice Cook House. Her graduate tenure was funded by the National Science Foundation Graduate Research Fellowship Program and the SUNY Diversity Fellowship Program. After completing her PhD, Rochelle joins the department of Psychology at Sarah Lawrence College as a Guest Faculty member. She hopes that whatever she does in this life will be in service of others, particularly the poor and disenfranchised.

To God, my secure base

And mummy, my other secure base

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CHAPTER 1

MIGRATION AND CHILD DEVELOPMENT FROM AN ECOLOGICAL PERSPECTIVE

Separation from family members has featured to some degree or another in the migration process. The pervasive narrative of the past maintained that men were the initiators of migration while women and children would only follow behind (Lee, 1966). Contemporary research refutes this perspective suggesting considerable variation in the sequence and structure in which families pursue migration (Adserà & Tienda, 2012). A consequence of these varying migration patterns is one cannot assume the 12 percent of foreign-born children currently living in the United States is a homogenous demographic subgroup (Zong, Batalova, & Hallock, 2018), especially with regard to what portion of their development occurred with their primary caregiver. Among immigrant youth who were younger than 20 years old between 2009 and 2011, 21 percent had been separated from their mothers for at least one year (Enchautegui & Menjívar, 2015). The potential importance of this fact for child development is accented by the fact that these children will have spent an average of 27 percent of their lives away from their parents (Enchautegui & Menjívar, 2015). That some foreign-born children experience maternal separation as a result of migration raises questions of whether the developmental outcomes of these children are different from those children whose families migrated together.

According to the bioecological model of development, children develop within a number of overlapping contexts (Bronfenbrenner, 1979). These include the microsystem, mesosystem, exosystem, macrosystem, and chronosystem (Bronfenbrenner, 1994; Bronfenbrenner, 1977). Each of these environmental contexts vary in approximate distance to the individual. Proximal factors are the people and places regularly encountered by the individual and exert their influence

directly. Distal factors are not necessarily ones that an individual readily interacts with, but rather are those factors that exert their influence indirectly. For instance, where a parent works or how much she or he works can both indirectly affect children's development. A significant thrust of Bronfenbrenner's theory was to compel researchers to engage in more ecologically valid scholarship (Bronfenbrenner, 1977). The choice to study maternal separation in the context of immigration is very much a nod to the ingenuity of this theory. Maternal separation is to be understood here as an important context for some immigrant children and one that requires more scholarly attention.

The theory is as much a psychological one as it is a sociological one (Bronfenbrenner, 1977). This dualism positions the theory quite aptly in a place where it is able to contend with the behavioral and socio-spatial aspects of migration. Consequently, the theory provides a useful framework from which to contextualize the factors working together to create the context of maternal separation in immigration. To begin the illustration, let us turn to the chronosystem. The chronosystem refers to normative and nonnormative changes in time (Bronfenbrenner 1986). Normative changes are those that have a shared meaning among societal members. Examples include puberty, marriage, and retirement. Nonnormative changes are unanticipated events. For example, the impact of the Great Depression on birth rates produced a specific cohort of individuals who differ significantly from other birth cohorts. In the last half-century there has been a shift in the directionality of global migration due to economic and demographic changes (Czaika & De Haas, 2014). A two-fold process has occurred; European emigration has slowed as new countries entered the migration market. The result is that global immigration is concentrated

to specific destination countries like the United States. What this means is that migrants today are much more likely to originate from non-European societies.

An explanation of this shift can be found in the macrosystem of popular immigration countries. The macrosystem is where one finds the societal rules and norms. Each society has its own customs upon which their formal and informal structures are built. Laws represent an important aspect of any macrosystem. For example, the Hart-Cellar Act of 1965 had a fundamental impact on the flow of migrants to the United States (Chishti, Hipsman, & Ball, 2015). Prior to this bill, American immigration policy gave preference to European migrants and limited the number of migrants from other nationalities. Once this quota system was replaced, more individuals were able to pursue relocating to the United States. While this policy made matters fairer, other immigration policies have more harmful consequences, particularly for families (Menjívar, 2012; Slack, Martinez, Whiteford, & Peiffer, 2015). Aspects of immigration law obstruct family reunification and significantly contribute to family separation (Enchautegui & Menjívar, 2015). For example, there are caps on family preference visas and reentry bans for previously undocumented immigrants. According to Enchautegui and Menjívar (2015), there were one million children and spouses of legal permanent residents awaiting visas in 2012. The top waiting countries included Mexico, Philippines, Haiti, Dominican Republic, and Jamaica.

A change in immigration laws is not enough to motivate migration; there are other social and economic factors to consider. A review of the relevant theories on international migration will allow us to better situate these motivations. The world systems theory of migration draws on early dependency theories which highlighted the core-periphery relationships created by the global capitalist economy (Arango, 2000). Colonial histories have shaped present day societies such that markets and wages are unequally distributed, and power is concentrated in the hands of former

colonial powers who represent a select number of core countries (Cardoso & Faletto, 1979). If this theory is joined with the macroeconomic neoclassical view of migration, which argues that the supply and demand of labor are unequally distributed across countries thereby producing wage differentials, we see that individuals living in low-wage countries are attracted to high wages in other countries and thus pursue migration in order to procure better wages (Harris & Todaro, 1970). Relatedly, there is a demand for foreign workers in industrial societies because of the segmentation of the labor market (Massey et al., 1993). In many industrial countries, the labor force is divided between high- and low-skilled workers. The job hierarchy created by this type of economic system attracts immigrant workers because they can be hired seasonally and paid relative little. This system also alleviates pressures from natives in the host-country who do not want to occupy the lower strata of the labor market (Massey et al. 1993). Employment opportunities are therefore an essential motivation for migration. This brings our discussion to the exosystem which consists of tangible institutions like the work place. The latter part of the 20th century showed an increase in the demand for female workers in the global economic system and accounts for some of the gender specific changes in immigration (Ehrenreich & Hochschild, 2004). The care work required in the Global North, largely driven by dramatic increases in Global North women in the workplace, finds that women from the Philippines (Parreñas, 2001; Parreñas, 2004), Mexico (Dreby, 2006; Dreby & Stutz, 2012) and the Caribbean (Morrison, Schiff, & Sjöblom, 2007; Solimano, 2010) migrate for work as nurses, domestic workers, and nannies.

The new economics of migration argues that the decision to migrate occurs within the family context, and that individuals pursue migration as part of a larger effort to diversify familial risks and resources (Stark & Bloom, 1985). In this way, migration is used as an income stabilizing strategy. The lack of credit, banking, and insurance options in low-income countries, or the

inequalities in accessing these options, compel families to look abroad as a way to overcome the effects of poverty (Massey et al. 1993). Our framework now turns us towards the mesosystem which is an interaction between two microsystems. The microsystem consists of spaces frequently inhabited by individuals such as the home, school, and workplace. When women make the decision to migrate for their families this decision is driven by factors in the home and at work. Let us use the Caribbean as an example as this is the region of focus in this dissertation. Since the 1970s, low-SES persons are among the majority of Caribbean migrants (Baptiste, Hardy, & Lewis, 1997; Crawford-Brown & Rattray, 2001). Given their fewer economic resources, families altered the manner in which they pursued migration. Instead of migrating as a family unit, as was conventional in the past, families shifted towards serial migration (Baptiste et al., 1997). Serial migration refers to family members migrating one by one over time. In many cases of Caribbean serial migration, it is the female who migrates first (Crawford-Brown & Rattray, 2001), and typically single mothers (Best-Cummings, 2009; Glasgow & Gouse-Sheese, 1995).

Together, the bio-ecological systems theory has framed our discussion of migration and the ways in which proximal and distal factors work together to create a context of maternal separation for some children. The discussion has revealed that global migration today is comprised of a small number of destination countries while there is great diversity in the countries of origin. What this means is that separation from family members disproportionately affects individuals from non-European societies. Moreover, when separation among family members occurs, there is a chance that the separation is prolonged due to the immigration policies in many destination countries like the United States. The interaction between poverty in developing countries and the feminization of migration is visible in the migration streams of recent years. Many poor women now migrate in order to take care of their families. The socio-political and economic changes taken together

have altered notions of who leaves and who gets left behind. Discussions on gender and migration have considered the impact of female migration on family life, especially now that it can no longer be assumed that when family separation occurs as a result of migration that the absent parent is the father. As more and more women migrate, there are increased cases of mother-child separation in the context of immigration (Parreñas, 2005; Suárez-Orozco, Bang, & Kim, 2011)

Maternal separation in the context of migration has several important implications for child development. This dissertation explores three aspects; parent-child relationship, child mental health, and child cognitive ability. The first paper examines the attachment patterns of Caribbean immigrant adolescents; comparing the second generation to two groups of first generation children, one group that migrated with their mothers (family migration) and another group that migrated after their mothers (separated migration). This is the first research program to document that attachment patterns are different across these three immigrant groups and establishes a link between maternal separation in immigration and attachment anxiety. The second paper explores the role of attachment security and parenting styles on the mental health of Caribbean immigrant youth. The results of this paper show that attachment security fully mediates the link between immigration experiences and mental health outcomes among 14- to 19-year olds. Finally, the third paper proposes executive function as a potential explanatory variable for the academic disparities observed among immigrant youth. The findings from this paper are useful to educators and policy-makers as it shows that deficits in executive function may account for variation in academic achievement among immigrant teens. Researchers and practitioners may want to consider developing executive function interventions and programs for this population.

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CHAPTER 2

STRANGE SITUATION: THE ATTACHMENT PATTERNS OF CARIBBEAN IMMIGRANT CHILDREN

INTRODUCTION

Early in his career John Bowlby was commissioned to write a report for the World Health Organization about mental health outcomes associated with maternal deprivation. Utilizing existing evidence of the time, he asserted that maternal deprivation was harmful to children (Bowlby, 1951). This evidence was drawn from direct observations of children in institutionalized care or extended hospitalizations, retrospective studies, and follow-up studies of children who had experienced deprivation in early life. Bowlby addressed the limitations of these studies in his concluding remarks, explaining that the ideal research conditions under which to study the effects of maternal deprivation on development would require taking healthy children out of otherwise loving families and placing them into conditions of maternal deprivation (Bowlby, 1951). What Bowlby could not have anticipated was that contemporary migration patterns would unfold in such a way as to create just such an opportunity to examine the nature of maternal separation on the outcomes of children.

At the time when Bowlby began his writings on the child's tie to the mother, war, global depression, and restrictive policies slowed international migration. As an illustration, estimates show that the total share of foreign-born persons in the United States plummeted to five percent by 1965 compared to almost thrice that amount at the turn of the 20th century (Pew Research Center, 2015). In addition to the decreased migration during that time, a commonly held belief was that men were the initiators of migration (Boyd & Grieco, 2003), which would have biased against any study of maternal separation in migration. The assumption that migration is a male-

led process associated separations among family members with father and husband absence (Lee, 1966). Modern examination of migrations patterns not only challenges these assumptions, but fully debunks them (Donato, 2015). In fact, it is now evident that women have always played a meaningful role in migration. Though some new destination countries are experiencing a feminization of migration, this occurred in centuries prior for high volume receiving countries like the United States (Donato, 2015).

The relation between gender and migration bears significant consequence for the lives of children worldwide despite early scholarship focusing primarily on the effect of husband's migration on women (see Chattopadhyay, 1997; O'Laughlin, 1998). The migration framework offered by Adserà and Tienda (2012) places children at the center of the migration process and shows that parental absence is not uncommon. Further, when women are seen as agents of their own migrations it becomes necessary to consider the possibility of maternal separation for children. Women undertaking migration for their families does not necessitate maternal separation, but conditions in the global socio-political and economic system provide threads that increasingly lead toward that end. The global economy demands female laborers (Ehrenreich & Hochschild, 2004) yet immigration policies are often prohibitive of families migrating as a unit (Dreby, 2010, 2015b; Enchautegui & Menjívar, 2015). Coupled with the fact that migration is often used as a poverty alleviation strategy for many families in developing countries (Massey et al., 1993), we begin to see these factors working together to create separations among family members and specifically separations among children and their mothers.

What we have today is a generation of migrant children who will spend some portion of their lives apart from their mothers. Thus, the overarching research question becomes: What are the consequences of migration on the nature of family dynamics over time and how might different

family dynamics affect children's development? Within this broader question lies a multitude of important conceptual and ultimately policy questions, one of which stands as a re-articulation of Bowlby's own from decades ago. That is, what impact does migration-based maternal separation have on the attachment bond between mothers and children? The immigration context has provided an opportunity to examine this question in the kind of quasi-randomized study called for by Bowlby. Therefore, the purpose of this research project is to take advantage of the circumstances of contemporary migration patterns, most notably the proportion of female migrants to the United States and the reality of family separations, in order to examine whether maternal separation in this context relates to attachment security. Before discussing the theoretical background of attachment theory, it is important to highlight a key geographic region that is the focus of the program of research.

The Caribbean

Maternal separation due to immigration affects many families worldwide, but is particularly prominent among Caribbean families (D'Emilo et al., 2007). The same legal and socioeconomic factors that express themselves in various regions across the globe are particularly salient in the Caribbean context. The majority of early Caribbean migrants belonged to the higher echelons of the social class system (Baptiste, Hardy, & Lewis, 1997). This pattern did an about-face with the Hart-Cellar Act of 1965. This United States federal law replaced country quotas and loosened immigration restrictions and subsequently attracted Caribbean migrants from lower socio-economic status (Best-Cummings, 2009). Given their fewer economic resources, this later generation of migrant families adopted a pattern of serial migration (Baptiste et al., 1997). Serial migration refers to family members migrating one by one over a period of time instead of migrating as a family unit. Women migrate first in many cases of serial migration in the Caribbean because

global labor markets since the 1970s have depended on female workers, particularly in care industries (Crawford-Brown & Rattray, 2001; Ehrenreich & Hochschild, 2004). Moreover many of these migrating women are single mothers, a point that also has potentially important implications for two factors theoretically critical to the formation of children's attachment bonds (Best-Cummings, 2009; Glasgow & Gouse-Sheese, 1995). First, because the child left behind in her Caribbean community may not have a proximate father, she may be raised within an extended kinship household. Second, because the migrating mother is a single parent, she may lack both emotional and tangible social support operating alone in her newly adopted country. Both of these factors as discussed below can influence both the formation and maintenance of attachment.

Family structure in the Caribbean makes the region an even more compelling context in which to examine maternal separation. For one, there is a prevalence of single mothers and female-headed households in Afro-Caribbean (Clarke, 1957; Hickling, Matthies, Morgan, & Gibson, 2012; Massiah, 1983) and Dominican families (Landale, Oropesa, & Bradatan, 2006). How children respond to mother absence, especially in societies where father presence is limited is an important question. One hypothesis is that these children feel the loss doubly as much. This idea is supported by what is known about societal norms about mothers and motherhood. Gendered notions of parenthood often means that maternal separation in immigration is met with more resentment and distress compared to paternal separation (Dreby, 2006, 2010; Gamburd, 2008; Parreñas, 2005a, 2005b). What it means to be a mother is socially constructed (Parreñas, 2005a), and children as well as society at large internalize messages that biological mothers are "real" mothers (Bragin & Pierrepointe, 2004). Research has found that children report more dissatisfaction with mother migration compared to father migration (Dreby & Stutz, 2012; Wen & Lin, 2012). Although not the focus of this study, mothers are also impacted by these same gender

ideas. Mothers express guilt about leaving children behind (Dreby, 2006) and married women deal with additional challenges negotiating their new role as breadwinner when husbands remain in the home country (Gamburd, 2004, 2008).

Caribbean families also practice a style of caregiving that emphasizes the role of extended family in the parenting process (Chamberlain, 2003; Falicov, 2007; Landale et al., 2006; Olwig, 1999). The attachment system does not place an inherent primacy on the mother. In fact, the effects of separation can be stemmed by a substitute figure (Ainsworth, Blehar, Waters, & Wall, 1978; Bowlby, 1988) and attachment representations are comprised of experiences with different significant relationships (van Rosmalen, van Ijzendoorn, & Bakermans-Kranenburg, 2014). Therefore, one possibility is the caretakers with whom children are left may have played an active role in the child's life prior to separation and so may act as a buffer during the period of separation. In line with this hypothesis Smith, Lalonde, and Johnson (2004) suggest that children may be so connected to these caregivers that when the times comes to reunite with parents, a second traumatic separation occurs. Another possibility is that the caretaker relationship comes with unintended, negative effects (Dreby, 2010). Some research has shown that caregivers do not provide adequate care or supervision for children left behind in the Caribbean (Crawford-Brown, 1999). This paper seeks to resolve this open question by exploring the nature of the bond between once left-behind children and surrogate mother-figures.

The literature indicates an average length of separation for Caribbean children as five years, but separations can last up to 10 years (Best-Cummings, 2009; Crawford-Brown, 1999). When compared to the children from Philippines, another region with high rates of maternal separation due to migration (see Parreñas, 2001), Caribbean children were separated from their parents for significantly more time (Rousseau, Hassan, Measham, & Lashley, 2008). A similar finding was

found in an American-based sample; Caribbean left-behind children were separated from their mothers for longer lengths of time compared to other popular migration origin regions (Cassells, 2015). Additionally, children are separated as early as the first week of life (Arnold, 2006), but more often during the first year (Best-Cummings, 2009; Crawford-Brown, 1999). Using data from the Children of Immigrant Longitudinal Study, Cassells (2015) found that Caribbean left-behind children were separated from their mother at younger ages compared to left-behind children from Asia and Central America. These findings make the Caribbean a relevant and apt region to explore migration-induced maternal separations.

As is apparent, there is a bi-directional purpose for looking at attachment in immigration. On the one hand we learn more about the consequences for these children and can empirically assess what the attachment bond may look like for children who were separated. On the other hand, we get to answer long-standing questions in the literature. For example, attachment researchers are interested in the stability of attachment security over time and whether intervening factors change the nature of the mother-child bond (Thompson, 2013). Negative early life events like loss of a parent or divorce can change attachment style (Waters, Merrick, Treboux, Crowell, & Albersheim, 2000). Having two groups of immigrant children, those who experienced separation and those who did not, allows us to approximate the impact of this kind of intervening life event on attachment bonds. Also, having some information on the age and timing of separation might provide clarity on whether there is a sensitive developmental window when these effects are most vulnerable. Finally, there is a need for cross-cultural studies of attachment and the role of multiple attachment figures for the individual (Thompson, 2013). Examining the quality of the relationship between children and the person who took care of them in mother's absence may shed some light on whether mother absence in early life can be buffered by an important other.

This paper is structured as follows. The first section presents the theoretical background, highlighting critical elements of attachment theory. Then the second section reviews existing studies using attachment theory in immigrant populations noting gaps in empirical assessments among immigrant children. The paper will then present study methodology, results, and conclude with a discussion of research findings and future research.

THEORETICAL BACKGROUND

The origins of attachment theory

During the time when Bowlby began theorizing about the relationship between mother and child the most dominant view was the secondary-drive theory. Secondary-drive theory suggested that infants bond to their mothers as a learned response to mothers meeting the babies' physiological needs (e.g. provision of food) (Bowlby, 1958). Bowlby challenged this idea based on his empirical observations that children exhibited significant distress upon separation from the mother, even in cases where food was provided by another caretaker (Bowlby, 1988). Bowlby reasoned that if feeding was indeed the main force behind these behaviors, then infants should be distressed by separation from the person who feeds them. And looking to studies with other animals, he found support in Lorenz's work on imprinting and Harlow's work with rhesus monkeys. Lorenz found that ducklings demonstrate a bond to the mother duck, yet they feed themselves (Lorenz, 1935).

Research by Harry Harlow debunked the secondary drive theory through experimental testing. His first experiment showed that rhesus monkeys preferred caretakers that provided comfort above and beyond a mechanical apparatus which provided food (Harlow, 1958). Regardless of whether the monkeys were fed on a simulated, wire mesh mother or a cloth mother, each group of monkeys spent significantly more time with the cloth mother. He also found that

regardless of nursing condition, infant rhesus monkeys preferred the cloth mother in times of fear (Harlow, 1958). These experimental findings not only helped Bowlby depart from secondary drive theory, but also helped him to develop a framework that articulated a hardwired, internal motivation for infants to bond to their mothers.

In chapter four of his seminal work, *Attachment and Loss, Vol 1. Attachment*, Bowlby underscored evolutionary theory as indispensable to his theory of attachment (Bowlby, 1969/1982). Bowlby contended that human behaviors must be considered as a function of the primeval environment from which they were produced. Therefore, attachment behaviors are best understood from an evolutionary perspective. Like other mammals that come into the world requiring close contact to their mothers in order to be protected from predators, so too do human offspring have an evolutionary and biological motivation to remain close to an individual the infant believes is capable of keeping them safe in times of danger or distress (Bowlby, 1969/1982).

Infants use a complex set of behaviors to elicit the desired response from their mother, namely comfort and security. The "sucking, clinging, following, crying, and smiling" behaviors Bowlby observed among infants can be classified as instinctual responses that are biologically programmed and organized within the attachment behavioral system. Broadly, the system functions to increase the likelihood of survival and reproduction (Bowlby, 1969/1982). More specifically, the set goal of the attachment system is to maintain proximity with the attachment figure, and the biological function of the system is to provide protection and security (Bowbly 1969/1982; Bowlby, 1988).

Normative aspects of attachment

While protest behavior (e.g. crying loudly upon separation from mother) is what initially allowed Bowlby to think about the role of separation anxiety in the dynamics of mother-child

bonds (Bowlby, 1960), from the outset of attachment theory, proximity maintenance was considered the defining feature of the attachment behavioral system (Bowlby, 1973). However, as the theory developed, some questioned whether this variable was sufficient to determine an attachment bond. One such scholar was Mary Ainsworth whose empirical studies with human infants helped to provide validation as well as extend a number of the theory's major tenants.

Based on her observations of Gandan infants, Ainsworth found that infants directed specific behaviors to their primary caretaker in the presence of multiple other caretakers (Ainsworth, 1963). Rather than staying near the caregiver, Ainsworth found infants were more likely to explore the world in the presence of this person. And so, the concept of a *secure base* was advanced as an important criterion by which to determine an attachment figure. Further, both Ainsworth and Bowlby noted than when alarmed or frightened, infants look to return to their caregiver for comfort and support; the mother took on the role of a *safe haven.* (Ainsworth, 1967; Bowlby, 1962/82). Together, the criteria for an attachment figure takes into account these four normative aspects of attachment.

Not only are these components helpful in describing attachment behaviors, they are also useful in identifying attachment figures. A person to whom these four behaviors—proximity maintenance, separation distress, secure base, and safe haven—are directed would be classified as a primary attachment figure (Bowlby, 1988). Though it is normative for individuals to have multiple attachment figures, there is variation in their treatment. These important people exist within an attachment hierarchy and in this hierarchy there is a tendency to identify one person as top of the list. Bowlby referred to this tendency as monotropy; the person who occupies this privileged position is indeed an important attachment figure (Bowlby, 1969/1982).

Hazan and Zeifman (1994;1999) were the first to explore the age-related changes in the

targeting of attachment behaviors. They developed the WHOTO (Who Do You Turn To?) interview measure that asks respondents to select a preferred person for each component. For example, "whom do you turn to for comfort when you're upset, feeling down, etc.?" is representative of the safe haven component. This work was the first to show that there are developmental shifts from parents to peers as targets of attachment behaviors. Children and adolescences direct their proximity maintenance behavior to peers rather than parents and begin to use peers are source of support between the ages of eight and 14. Parents remain important for separation distress and secure base until late adolescence (Hazan & Ziefman 1994; 1999).

Individual differences in attachment

In addition to her contribution to the development of the secure base concept, Mary Ainsworth was also fundamental in delineating individual differences in attachment. Her seminal Baltimore study introduced the Strange Situation Paradigm, the first empirical assessment of attachment patterns of behavior (Ainsworth et al., 1978). Using the distinctive normative components of attachment, Ainsworth and her colleagues developed a laboratory procedure that measured infant behaviors over the course of eight episodes. The procedure consists of a child playing with toys in a room with his or her caregiver. Over the course of a 20-minute period, the caregiver and a third party (i.e. stranger) take turns entering a leaving the room while also alternating their engagement with the child. The dimensions of interest to the researchers were exploratory behavior and attachment behavior. Data showed that some infants explored their environment more freely when mothers were present and were less exploratory in her absence or in the presence of a stranger.

The reunion episodes, when the stranger exists and the mother returns, illustrated individual differences in the nature of the child's attachment to the mother. Ainsworth et al. (1978)

developed a classification system based on their observations of the reunion episodes (see Table 1.1). The bulk of the infants were referred to as securely attached. These infants were upset when separated from mothers but looked to the mother for comfort when she returned (Ainsworth et al., 1978). Another group of infants were insecurely attached. Within this group are some infants who demonstrate significant distress during separation and are difficult to soothe upon return. These are anxious-resistant. Another group of insecure infants were categorized as avoidantly attached. These infants were detached during the separation and avoided the mother upon reunion (Ainsworth et al., 1978).

Table 1.1. *Attachment classification based on Strange Situation Procedure*

	Frequency distributions	Infant behavior at reunion
Secure attachment	60%	seeks comfort and trust caregiver to provide support
Anxious-avoidant attachment	15%	little sign of distress, appears indifferent to caregiver support
Anxious-resistant attachment	10%	significantly distressed, cannot be soothed, and appears angry at caregiver
Disorganized attachment	15%	displays uncoordinated efforts towards proximity to caregiver, typified by fear and anxiety

A fourth attachment pattern was identified by Mary Main and Judith Solomon, who found that some infants could not be captured by Ainsworth's classification system (Main & Solomon, 1986) as their behavioral patterns were disorganized. For example, these infants greeted their caregivers brightly upon return, but then suddenly avoid contact. They appear dazed during comfort and avoid eye contact with caregiver. Main and Solomon refer to this as behavior as "avoidance-in-contact," (Main & Solomon, 1986). Main and Solomon (1986) suggested that these

infants had mothers who suffered from mental illness like depression.

Internal working model

Hitherto the discussion of attachment theory and its operations have been confined to attachment in infancy. It is limiting to view attachment in terms of mere presence and absence of attachment figures, especially given the physical and cognitive changes that individuals endure with age (Ainsworth et al., 1978). Experiences with attachment figures are collected and stored within a cognitive map of the individual (Bowlby, 1973). These mental representations, referred to as an internal working model, provides information concerning the environment, self, and others. According to Bowlby, "in the working models of the world that anyone builds a key feature is his notion of who his attachment figures are, where they may be found, and how they may be expected to respond," (Bowlby, 1973, p. 203). Note that such an internal working model means that the type of attachment one has with their primary caregiver operates regardless of the actual presence of that caregiver.

The goal-corrected nature of the attachment behavioral system is centrally expressed in the internal working model. Individuals receive feedback regarding their behavior, and the behavior of the important other, which helps to govern future behavior in interactions with that person. Behaviors are assessed based on their effectiveness in eliciting the desired outcome, and sometimes altered if determined that a new action would garner the desired response. Nested within the construct of the internal working model is an evaluation of others as supportive and responsive—working model of others, and an evaluation of the self as worthwhile or lovable—working model of self (Bowlby, 1973). That is, one's working model of their primary attachment relationship generalizes with maturation extending to peers, partners, and ultimately the self. The process of developing the models begins around nine months (Bowlby, 1988), and there has been

some evidence showing that infants as young as 12 months hold mental representations of the social interactions based on personal experiences with their own mothers (Johnson, Dweck, & Chen, 2007).

Using a visual habituation paradigm, Johnson, Dweck, and Chen (2007) constructed a scenario with a graphical mother and infant at the base of a hill. In the scenario, the mother walks partly up the hill. Her infant remains at the bottom of the hill and begins to cry. In one condition the mother returns to the base of the hill to respond to the crying infant. In another condition, the mother continues to the top of the hill without attending to her crying infant. The authors' hypothesis that secure infants would look significantly longer to the second scenario, as it would represent an unfamiliar experience, was supported. Extending these findings, Johnson et al. (2010) used a similar procedure, but altered the behavior of the infant. In one condition, the crying infant would approach the mother who has returned to provide support and in another condition the crying infant would withdraw from the mother. Results showed differences in the expectations of insecure children. While insecure-resistant infants were similar to secure infants in that they expected the infant to approach the mother, insecure-avoidant infants did not hold this expectation and looked longer at the scenario where the infant approaches the mother. Together, these findings provide support for the argument that infants hold expectations about social behaviors, particularly between mother and child, which are informed by lived experiences.

The internal working model of self and other has a hierarchical structure (Collins & Read, 1994). Individuals may have separate working models for each parent and their models may vary according to their role. At the top of the network exists a general model of attachment representations containing one's overall relationship histories and experiences. At the second tier there are models for parent-child relationships and peer relationships. Within parent-child

relationships there are models of mother and father. Within peer relationships there are models of friendships and romantic relationships. These can be further refined to include specific friends and one's romantic partner (Collins & Read, 1994).

Main, Kaplan and Cassidy (1985) were the first to explore attachment longitudinally and articulated the notion that individual patterns of attachment behavior are modulated by the internal working model. They found that discrete differences in attachment security were not limited to freedom in the physical sense (i.e. comfort in exploring the environment). Insecure infants have more restricted attention, behavior, and emotional expression compared to secure ones (Mary Main, Kaplan, & Cassidy, 1985). In particular, they noted key psycholinguist differences between secure and insecure parent-child dyads. Secure parent-child dyads had open and free flowing conversations while insecure parent-child dyads had either stilted conversations or conversations that flowed in fits and starts (irregular movement). In their study they showed six-year-olds an image of a children who was separated from their mother and asked what the pictured child would feel or do in that situation. The interviews revealed that secure children were more comfortable with emotional expression than insecure children, and some insecure children responded that they were not sure what they would do in this situation while others indicated that they would retaliate against the parent or harm themselves. In contrast, secure children reported that they would call on trusted adults for help.

Measures of attachment in adolescence and adulthood

Various continuous and categorical approaches have been employed in the study of individual differences in adolescent and adult attachment, each with their own advantages and disadvantages (Griffin & Bartholomew, 1994). The typology approach places individuals into ideal types akin to Ainsworth's (1978) classification system. One popular measure was developed

by Bartholomew and Horowitz (1991) based on linear combinations of the working model of self and other. The Relationship Questionnaire (RQ) constructs a model of self and other across two dimensions (positive and negative) through which four theoretical ideal types of attachment behavior can be formed (see Table 1.2) (Bartholomew & Horowitz, 1991).

Secure individuals view the self and others positively; they believe themselves to be lovable and expect others to be responsive. The polar opposite of this are fearful individuals who see themselves and others negatively. Not only do they think they are unlovable, but they also expect others to be rejecting and are averse to intimacy. Preoccupied individuals see themselves negatively, but judge others as trustworthy. These individuals develop a dependency on social relationship, often using this as a means through which to fulfill their self-esteem needs. On the other hand, dismissing individuals views themselves positively while expect others to be unreliable. For this reason, they tend to avoid intimacy, often minimizing its importance while simultaneously valuing independence and self-reliance. Bartholomew and Horowitz (1991) found important gender differences in these attachment categories; men are more likely to report themselves as dismissing while women are more likely to report themselves as preoccupied.

Table 1.2. *Adult attachment classification based on Bartholomew & Horowitz (1991)*

	Frequency distribution	Model of self and other
Secure	47%	Positive view of self and others
Dismissing	18%	Positive view of self, negative view of others
Preoccupied	14%	Negative view of self, positive view of others
Fearful	21%	Negative view of self and others

Another way of looking at attachment in adolescence and adulthood is by using a dimensional approach, which takes into account the variation within group categories and views

at attachment security on a continuum (Cummings, 2003). A recent measure that has been given much attention is the Experience of Close Relationships-Relationship Structures (ECR-RS) (Fraley, Heffernan, Vicary, & Brumbaugh, 2011). One advantage of this measure is that attachment is assessed in specific relationship domains rather than leaving the attachment reference category ambiguous as is often the case with categorical measures. In the ECR-RS, participants are asked nine questions regarding a specific relationship from which composite scores can be derived corresponding to attachment related anxiety and avoidance. Example of attachment-related anxiety is "I don't fully trust this person" while attachment-related avoidance would be "I don't feel comfortable opening up to this person" (Fraley et al. 2011).

In summary, this theoretical review has traced attachment across the lifespan and showed that the internal working model functions in early life and is influenced by interactions with main caregivers. Main, Hesse and Kaplan (2005) showed that infant attachment security to mother, as classified by the Strange Situation Paradigm, predicts adult attachment security at age 19 using the Adult Attachment Interview (AAI), suggesting stability in attachment patterns. The theoretical and empirical evidence support the argument to be advanced, which is that migration may act as a traumatic life event, especially for those children who experienced maternal separation in early life, and may alter attachment patterns of behavior. Should there be differences between the three groups of immigrant children, then some support is garnered for the notion that a change in attachment patterns occurred as a result of not only migration, but separation from a parent due to migration. Additionally, various measures are used in the study of attachment patterns. Some recommend that multiple assessment be used in studies on attachment (Scharfe & Bartholomew, 1994). Therefore, a strength of the present study is its use of a multi-instrumental technique. The following section will review extant literature of attachment and immigration that will help to

motivate study aims and ground study hypotheses.

LITERATURE REVIEW

Attachment and immigration

Research has shown an important application of attachment theory to the immigration experiences (van Ecke, 2005). For example, Polek, van Oudenhoven, and ten Berge (2008) found that secure attachment was positively related to psychological well-being and identification with Dutch society and culture among immigrant adults, whereas fearful, preoccupied and dismissing patterns of attachment showed inverse relationships. In another study, both secure and dismissing attachment styles buffered sociocultural stress, protecting adult immigrants from psychological distress (Sochos & Diniz, 2012). Belizaire and Fuertes (2011) found in a sample of adult Haitian immigrants that anxious attachment was significantly related to acculturation stress and predicted poorer quality of life across physical, psychological, social, and environmental dimensions. One study to look specifically at the effect of family separations on adult attachment found a significant effect on attachment anxiety, but not avoidance (Santa-Maria & Cornille, 2007).

These studies show that research on attachment and immigration are often limited to adult samples. As one scholar puts it, "studies examining the relationships between different migration experiences and attachment among children are clearly needed," (van Ecke, 2005, p.470). Over a decade later this request has scarcely been fulfilled. This paper seeks to fill two literature gaps by empirically assessing attachment patterns among of immigrant children, and specifically examining the attachment styles of immigrant children who experienced maternal separation.

Attachment and maternal separation

Attachment theory features heavily in the discussion of maternal separation in immigration (Arnold, 2006, 2011b; Bragin & Pierrepointe, 2004; Crawford-Brown, 1999; Gindling & Poggio,

2012), yet few have undertaken rigorous empirical analysis. What has been done are rich qualitative studies (Arnold, 2006; Gindling & Poggio, 2012; Lopez, 2010; Smith et al., 2004).

Qualitative studies

Several qualitative studies document feelings of abandonment, loss, and rejection among Caribbean left-behind children (see Dillon & Walsh, 2015 for a comprehensive literature review). These feelings are associated with tension and stress to the mother-child relationship, especially after reunification. One left-behind woman recalls her own experience in the following quote:

> ''I didn't know how to take this woman. I had seen pictures of her so I knew her physical appearance but I didn't know her. I was ambivalent, I felt wanting to hug and not wanting to hug; my body was kind of withdrawing as well. That's how I experienced it but she was warm and wanted to hug. I could not understand why my body fell towards her and back from her…" (Arnold, 2006, p. 164).

The quote above suggests that the reunion experiences for some left-behind children may have similar elements to the articulation of a disorganized attachment style. Others working with this population have suggested that the young age at which children are separated leads to a lack of "mental picture" of the parent (Pottinger, Stair, & Brown, 2008). In many cases, communication does not alleviate these issues because conversations tend to be proscriptive during separation (Best-Cummings, 2009). Because their lives are apart, parents tend to know little about the day-to-day life of their children, and conversations tend to center around the child's behavior or performance in school. Difficulties in communication continue when families are reunited (Arnold, 2006). Some parallels could be drawn between the reported challenges with communication and the psycholinguistic differences cross attachment styles observed by Main and her colleagues (Main, Hesse, & Kaplan, 2005).

Maintaining a strong emotional bond with their children is a challenge for many transnational parents. Remittances, or sending money home, are often seen as a way for parents to express their love and care (Gamburd, 2008; Gündüz, 2013). In Jamaica, the practice of sending barrels filled with material resources is common among migrant parents, so much so that children with parents aboard are termed "barrel children"(Crawford-Brown, 1999). In fact, many children make judgments of their mothers' love based on their financial contributions (Crawford-Brown, 1999; Crawford, 2003; Glasgow & Gouse-Sheese, 1995; Olwig, 1999). Gendered parenting roles makes this strategy sometimes less effective for migrant mothers. While the expectation of migrant fathers is for them to be economic providers, migrants mothers have the double responsibility of providing financial and emotional support for their families (Dreby, 2006; Parreñas, 2005b).

The relationship between emotional bonds and economic provision is precarious for three reasons. First, some children feel as though their migrant parents choose money instead of being with them. One left-behind girl says, "for me, the money is not really important," (Dreby, 2015, p. 248). Second, some children feel unable to express their emotions to their parents because they are expected to feel gratitude about their mothers sacrifice and many fear upsetting their mothers by speaking freely (Baptiste et al., 1997; Pottinger & Brown, 2006). Being unable to have open dialogue may lead to an idealization of the mother and a shutting down of valid emotions or concerns within the child, all of which are associated with a dismissing attachment style (Main, Hesse, Kaplan, 2005). The third reason relates to the strain female migration places on parental relationships as mothers and father adjust to changes in breadwinner roles. This may indirectly impact the child through increased parental stress and subsequently harsher parenting behaviors (see Cassells & Evans, 2017).

PURPOSE OF THE STUDY

Hypotheses

The present study seeks to answer the following questions: (1) what are the differences in patterns of attachment between second-generation Caribbean adolescent children, children who migrated from the Caribbean to the United States at the same time as their mothers, and Caribbean children who were separated from their mothers as a result of migration? and (2) How do attachment to mothers and attachment to caregivers compare for children who experienced separation? With regard to the first research question, this paper hypothesizes that there will be group differences in patterns of attachment, and that children who were separated from their mothers due to migration are expected to report an insecure attachment style compared to the other two groups. Mothers are expected to be less likely the targets of attachment behavior for separated children which will be evidenced in their absence from the WHOTO, particularly on the safe haven and secure base components. A dimensional approach to attachment would suggest that these children are likely to have greater attachment anxiety due to potentially greater mother unreliability.

Concerning the categorical approach, separated children are hypothesized to more likely report themselves as dismissing or fearful. According to Main et al. (2005) children who are dismissing tend to idealize their parents and ignore or downplay valid evidence of a distressing situation. Separated children might do the same in an effort to reconcile their awareness of traditional mother roles as well as to fulfill their desire to have a typical mother-child relationship, one not marked by prolonged separation. On the other hand, a fearful pattern of attachment may emerge considering the possibility that separated children may have been seeking a haven of safety during their mother's absence with no apparent solution. This is especially likely if the caregiver

who took care of them most was rejecting or neglectful. These children may learn during the separation to see others as untrustworthy and themselves as unlovable. There are no a priori predictions with respect to question two.

METHOD

Participants and Design

This cross-sectional study was designed to explore differences in patterns of attachment between three different groups of immigrant children. A hundred and twenty-five (125) Caribbean immigrant teenagers, ages 14 to 19, were recruited primarily from two afterschool programs in the Bronx and in Westchester County, New York State. One participant is excluded from analyses due to incomplete portions of the demographic survey. Fifty-three were second-generation immigrant children, 39 migrated with their mothers (family migration) and 32 migrated apart from their mothers (separated migration). The average age of the participants in the sample was 16 years old (M = 16.19; SD = 1.26), though second-generation children were younger (M =15.75, SD = 1.30) than children of family (M = 16.41, SD = 1.04) and separated (M = 16.66, SD = 1.23) migration. There was an even divide between males and females (n = 62) in the overall sample, however, some gender imbalances exist within in the foreign-born groups. There were more girls in the family migration group and more boys in separated migration group (see Table 3). Age and gender are included as covariates in analyses.

Recruitment. Participants were recruited on the basis of their migration experience, with children fitting into one of three migration groups. (1) *Second generation*: U.S. born children of immigrant (2) *Family migration*: foreign-born children who migrated to the U.S. at the same time as their mothers (3) *Separated migration*: foreign-born children who migrated to the U.S. apart from their mothers. In all but one cause children migrated to the U.S. after mothers. All of the

second generation and family migration participants were recruited from a high school afterschool program in the Bronx. In addition to being recruited from this location, some of the participants in the separated migration group were recruited from a high school afterschool in Westchester County.

Eligibility. Youth were identified by the afterschool director as potentially meeting the inclusion criteria. A formal eligibility screening was conducted by the afterschool director or the principal investigator. The inclusion criteria are as follows: (a) youth between the ages of 13-19 (b) foreign-born or U.S.-born to Caribbean parents. Eligible Caribbean countries included the 13 sovereign nations (Antigua and Barbuda, The Bahamas, Barbados, Cuba, Dominica, Dominican Republic, Grenada, Haiti, Jamaica, Saint Kitts & Nevis, Saint Lucia, Saint Vincent and the Grenadines, Trinidad & Tobago) and Guyana, (c) English proficient, (d) youth must currently live with mother (e) mother migrated from country of birth to U.S. (no pattern of repeated migrations).

Table 1.3. *Demographic characteristics*

	2nd generation (***n*** **= 53)**	Family migration (***n*** **= 39)**	Separated migration (***n*** **= 32)**
Child characteristics			
Female	52.80	61.50	31.00
Young adolescents	69.80	48.70	46.90
Nativity			
Antigua & Barbuda	-	-	3.10
Dominican Republic	-	35.90	21.90
Guyana	-	15.40	6.30
Haiti	-	2.60	-
Jamaica	-	46.20	68.80
Mother characteristics			
Age	45.72 (6.79)	42.62 (6.67)	41.45 (5.88)
Married	56.60	48.70	31.30
Educational attainment			
Less than high school	7.00	19.40	12.00
High school/GED	34.90	25.00	44.00
Some college	27.90	41.70	24.00

Bachelor's degree +	30.20	13.90	20.00
Nativity			
Antigua & Barbuda	-	-	3.10
Dominican Republic	22.60	35.90	21.90
Guyana	13.20	15.40	6.30
Haiti	-	2.60	-
Jamaica	54.70	46.20	68.80
Saint Kitts & Nevis	5.70	-	-
Saint Lucia	3.80	-	-
Family characteristics			
Child lives with biological mother and father	47.20	41.00	6.30
Child lives with biological mother and stepfather	9.40	2.60	21.90
Child lives with mother and mother's partner	1.90	5.10	6.30
Child lives with mother alone	41.50	48.70	62.50
Child alternates living with mother and father	-	2.60	3.10
Father lives abroad	3.80	20.50	45.20
Child eligible for free/subsidized lunch	73.50	91.90	86.70

As shown in Table 1.3, the majority of the sample was of Jamaican (56%) and Dominican (26%) descent and classified themselves as either lower-middle class (37%) or working class (44%). More than half (57%) of the participants did not currently live with their biological fathers with 19% of their fathers residing abroad. Youth in the sample indicated economic improvement as the chief reason for their mothers' migration to the United States. Overall, the average age reported by youth for their mothers was 43.57 (*SD* = 6.73) and many of the mothers were reported as earning a high school degree and attending some college. Table 1.3 provides a breakdown of the demographic information of children and their families across the three migration groups.

Table 1.3 also includes information on a categorical age variable that was created due to the uneven age distribution in the sample. Slightly more (57%) younger adolescents, ages 14 to 16, in the sample.

Procedure

The project protocol was reviewed and approved by the Cornell Institutional Review Board. Both parental consent and child assent were obtained. Youth were invited to a classroom where they were given a unique ID number. Youth were given access to the Qualtrics survey that contained a demographic questionnaire and attachment measures. Children who were separated in migration had to complete additional information about who cared for them most in mother's absence. At the end of the study each participant was debriefed and compensated $20 for their time.

Measures

Who do you turn to (WHOTO) is an interview measure developed to assess the attachment behaviors visible in infancy in a sample of young children and adolescents through the use of items that are similar (Hazan & Zeifmann, 1994). Each item taps into a component of attachment (i.e. proximity maintenance, secure base, safe haven, and separation distress). The measure allows researchers to determine the people towards whom attachment behaviors are directed. Respondents can list up to four persons important others per item. Four questions, each corresponding to a component of attachment, were used in this study. For example, "the person I know will always be there for me" was used as a measure of secure base. The WHOTO can be used as a continuous measure by calculating total scores and ranking the highest scored person either overall or by component. The person listed in the first position receives the highest score of 4 and the person listed in the last position receives the lowest score of 1. A score of zero is

given if no one is listed. The WHOTO can also be used categorically indicating presence or absence of a hypothesized important other.

The Relationship Questionnaire (RQ) is a single item scale consisting of four short paragraphs describing a prototypical patterns of attachment: secure, preoccupied, fearful, and dismissing (Bartholomew & Horowitz, 1991). Participants rate each paragraph on a 7-point Likert scale for how well they correspond to the way they typically relate to others. A best-fitting style is also selected. The highest scoring attachment style is calculated based on scores on each paragraph. In cases of a tied for highest score, the best-fitting style is used instead. According to Ravitz, Maunder, Hunter, Sthankiya, and Lancee (2010) the RQ is among 11 of the most commonly used adult attachment measures with robust psychometric properties. A review of studies using the RQ found adequate reliability and strong face and discriminant validity. The measure demonstrated stability of attachment classification with little differences in participants self-report at time one and eight months later at time two (Scharfe & Bartholomew, 1994). This moderate stability is indicative of moderate reliability.

The Experience of Close Relationships-Relationship Structures (ECR-RS) questionnaire is a self-report measure of attachment across a number of close relationships (Fraley et al., 2011). The nine-item scale ($\alpha = .84$) generates two scores, one for attachment-related anxiety and another for attachment-related avoidance. The measure allows for domain-specific attachment patterns to be assessed. All respondents completed the ECR-RS about their attachment relationship with their mothers. The group of children separated in migration also completed the ECR-RS about their attachment relationship with their surrogate caregivers. In adult (Fraley et al. 2011) and adolescent (Donbaek & Elklit, 2014) samples there is high internal reliability for each subsample (alpha values greater than .80). Donbaek and Elklit (2014) found strong discriminant and convergent

associations between the ECR-RS and the RQ.

RESULTS

Attachment at the component level: Analysis of the WHOTO

Descriptive statistics

Parents, peers, and other relatives accounted for an average of 89 percent of the responses across each attachment component with remaining responses being listed as "no one" and to a lesser extent non-relative adult (Table 1.4). Table 1.5 shows that mothers were the relationship target with the highest percentage of responses across each component and accounted for more than half of the responses on the secure base pillar (60%). Friends were the second highest reported relationship target for proximity maintenance (17%) and safe haven (21%).

Table 1.4. *Percentages of responses by relationship category and attachment component*

Relationship Category	Attachment components			
	Separation distress	Secure base	Proximity maintenance	Safe haven
Parents	53.30	66.40	45.90	35.20
Peers	4.90	10.70	25.40	28.70
Other Relatives	21.30	17.20	22.10	23.80
Total	79.50	94.30	93.40	87.70
No one	19.70	4.10	5.70	11.50
Non-relative adult	0.80	1.60	0.90	0.80
Grand Total	100.00	100.00	100.00	100.00

The WHOTO measure was used to evaluate the attachment hierarchies of immigrant adolescents, particularly in order to assess whether mothers were listed first (i.e. evidence of monotropy) on each normative aspect of attachment; separation distress, secure base, proximity maintenance, and safe haven. Table 1.6 shows the percentage spread by migration group revealing that overall youth in the serial migration group listed their mothers first at a lower percentage than youth in the second generation and family migration, with an exception of proximity maintenance

where there was only a one percentage point difference between them and youth in the family migration group. In terms of secure base, only half of separated children listed their mothers first while a majority of children in the other two groups listed their mothers as such on the same dimension. First-four percent of youth in the family migration group listed mother first on proximity seeking, a respective 19 and 18 percentage point difference between family migration and separation migration groups.

Table 1.5. *Percentages of responses for relationship targets across attachment components*

Relationship target	Attachment components			
	Separation distress	Secure base	Proximity maintenance	Safe haven
Mother	43.40	59.80	43.30	30.30
Father	9.80	6.60	2.50	4.90
Grandparent	4.90	3.30	7.40	3.30
Sibling	9.80	9.00	9.00	11.50
Friend	3.30	6.60	17.20	20.50
Romantic partner	1.60	4.10	8.20	8.20
Other relative	6.60	4.90	5.70	9.00
Non-relative adult	0.80	1.60	0.80	0.80
No one	19.70	4.10	5.70	11.50
Grant Total	100.00	100.00	100.00	100.00

The original dependent variables were on an ordinal scale (0-4) with four indicating the first position and zero indicating a total absence. Crosstabulations of the dependent variables across levels of the independent variable (migration group) revealed low counts on units one, two,

and three. The dependent variables were recoded to collapse these units into one. The resulting scale (0 to 2) represents the following: 0 = mother is listed nowhere, 1 = mother is listed somewhere, and 2 = mother is listed first (reference group). The assumption of parallel lines was met in all cases with the exception of secure base, $p = .006$. Multinomial regressions were used in all analyses. Table 1.7 shows the results of these regressions.

Table 1.6. *Percentage of youth who listed mother first on attachment dimensions by migration group*

Migration group	**Separation Distress**	**Secure Base**	**Proximity maintenance**	**Safe Haven**
Second Generation	45%	60%	38%	34%
Family Migration	49%	67%	56%	33%
Separated Migration	33%	50%	37%	20%

Proximity maintenance

The overall model for proximity seeking was not significant; there was no main effect of gender, age, or migration group, all *p*s > .05. Parameter estimates showed a significant difference family migration and separated migration, Wald χ^2 (1) = 4.23, $p = .035$. These findings are consistent with Table 1.6 that showed a large share of children in family migration directed proximity seeking behavior towards their mothers.

Separation distress

The model for separation distress was not significant and there was no main effect of gender, age, or migration group, all *p*s > .05. A gender effect was found in the parameter estimates showing a comparison of nowhere to the reference category of first, Wald χ^2 (1) = 5.03, $p = .025$. Girls were more likely than boys to list their mothers nowhere rather than first on the separation

distress dimension.

Table 1.7. Multinomial regressions prediction mother placement on WHOTO measure

	χ^2	*n*	*df*	*p*
Proximity seeking	8.89	122	8	.352
Separation distress	9.79	122	8	.280
Secure base	18.21	122	8	.020
Safe haven	11.16	122	8	.193
Mother total score	24.34	122	2	.002

Secure base

Results showed that the overall model for secure base was significant (Table 1.7). In this model there was no main effect of gender, $\chi^2(2) = .62$, $p = .733$, or age, $\chi^2(2) = 3.48$, $p = .175$, but a significant main effect of migration group, $\chi^2(4) = 16.25$, $p = .003$. Parameter estimates showed a significant difference between separated children and 2nd generation children on listing their mother nowhere compared to first, Wald χ^2 (1) = 7.75, $p = .005$. This suggests that separated children were more likely than 2nd generation children to report their mothers nowhere on secure base when compared to listing them first. Figure 1.1 illustrates the nature of these findings.

Safe haven

The overall model for safe haven was not significant. There was no main effect of age, Wald χ^2 (2) = 2.24, $p = .362$, or migration group, Wald χ^2 (2) = 5.27, $p = .260$, but there was a significant effect of gender, $\chi^2(2) = 6.17$, $p = .046$. Parameter estimates showed that going from girls to boys there was a decrease in log odds of putting mom somewhere compared to first, Wald χ^2 (1) = 5.40, $p = .020$. Boys were less likely than girls to put mom nowhere rather than first.

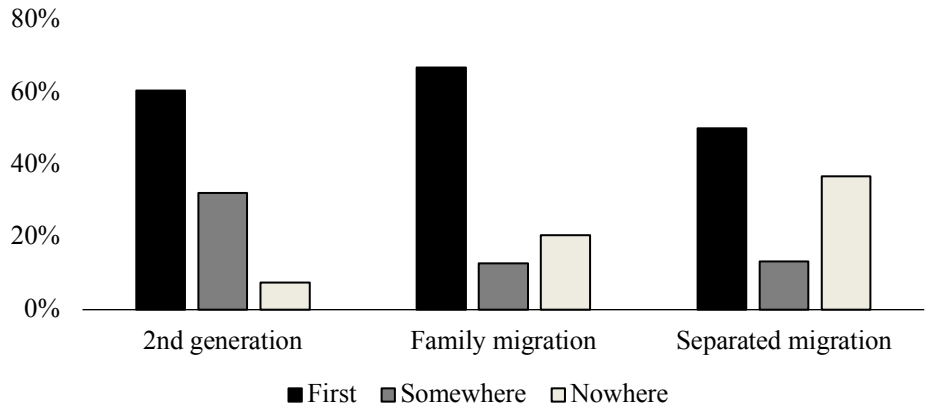

Figure 1.1 *Mother position on secure base component across migration groups*

Overall score

Another way to analyze the WHOTO by the overall score rather than component scores. The total score for mother is on a scale of zero to 16 with zero indicating that the mother was not listed on any part of the measure and a score of 16 indicating "full blown attachment", or that the mother listed first everywhere. Like the individual components, low frequencies were observed in some levels of the mother total score, so the variable was recoded in the following way: 0 = mother listed nowhere, 1= mother listed somewhere, 2 = mother listed first everywhere, which allows us to see differences between full blown attachment compared to no attachment. The test of parallel lines was observed $p = .067$. Still, a multinomial regression was used and showed the overall model was statistically significant (Table 1.7).

There was a significant main effect of migration group, $\chi^2(4) = 14.13$, $p = .007$ as well as of age, χ^2 (2) = 11.84, $p = .003$ and gender, χ^2 (2) = 6.50, $p = .039$. Parameter estimates revealed that separated migration children were more likely than 2nd generation children to list mother nowhere rather than everywhere, Wald χ^2 (1) = 6.02, $p = .014$. Separated children were also more likely than family migration to do the same, Wald χ^2 (1) = 5.94, $p = .015$. Second generation were also more likely than family migration to put mother somewhere in the middle compared to first

everywhere, Wald χ^2 (1) = 3.83, p = .050.

Parameter estimates also show a gender difference in putting mother somewhere rather than first. Boys are less likely than girls to put mother somewhere rather than first, Wald χ^2 (1) = 5.93, p = 015. There was an age difference in putting mother somewhere rather than first, Wald χ^2 (1) = 6.07, p = 0.14. Older adolescents are more likely than younger adolescents to put mother somewhere rather than first. When compared to separated migration, children of family migration are less likely to put mother somewhere compared to putting her first, Wald χ^2 (1) = 4.74, p = 0.029.

The results from the WHOTO revealed that separated children are more likely to list mothers nowhere on all attachment components than the other two groups. The component level analyses revealed the secure base component as an important construct for assessing the importance of mothers in the lives of immigrant adolescents. Similar to the overall WHOTO result, separated children were least likely to list mother first on the secure base item. Mothers were more likely to be absent from the secure base item for separated children compared to the other two immigrant groups.

Categorical approach

Descriptives

One third of youth in this sample described themselves as secure (roughly 32%) while another third (roughly 32%) described themselves as dismissing. About 24 percent describes themselves as fearful, while 12% described themselves as preoccupied. Figure 1.2 shows the results of the RQ by migration group. Second generation children reported the secure (32%) and dismissing (31%) styles as best fitting at similar rates. On the other hand, children of separated migration were less likely to report the secure style as best fitting (28%) and were most likely to select

dismissing as the attachment style that best fits them (38%). The preoccupied style was selected the least among all three groups but was particularly lower for children of joint migration (3%) who listed themselves as fearful at a higher percentage (roughly 36%) than the other groups.

A Chi-Square test revealed there is a statistically significant association between gender and RQ score, χ^2 (3) = 18.63, p < .001, Cramer's V = .388, which is indicative of a medium effect. On the whole, girls (83%) in this sample are more fearful than boys (17%), and boys (67%) are more secure than girls (33%). Boys and girls were roughly the same on preoccupied and dismissing styles. A Chi-Square revealed a significant effect of age on RQ, χ^2 (3) = 11.27, p = .010, Cramer's V = .301.

Best fitting attachment style

This paper explored whether children from different migration groups would vary in their attachment style. It was hypothesized that separated migration children would demonstrate an insecure pattern of attachment with no a priori predictions on the specific style. A crosstabulation of the best-fitting style across migration group revealed low cell counts in the fearful and preoccupied categories. For this reason, a binomial logistic regression was employed using a dependent variable containing only the dismissing (n = 40) and secure (n = 39). Gender and age were entered into the model as covariates given known association with independent variable. Results of the binary logistic regression indicated that the overall model was not significant, χ^2 (4) = 3.61, p = .461; none of the predictor variables being significant, all ps > .05. There was no difference in the likelihood of being secure or dismissing as a result of migration group. Overall, results from the RQ showed that immigrant children in this sample rated themselves as either secure or dismissing, with no differences across migration group.

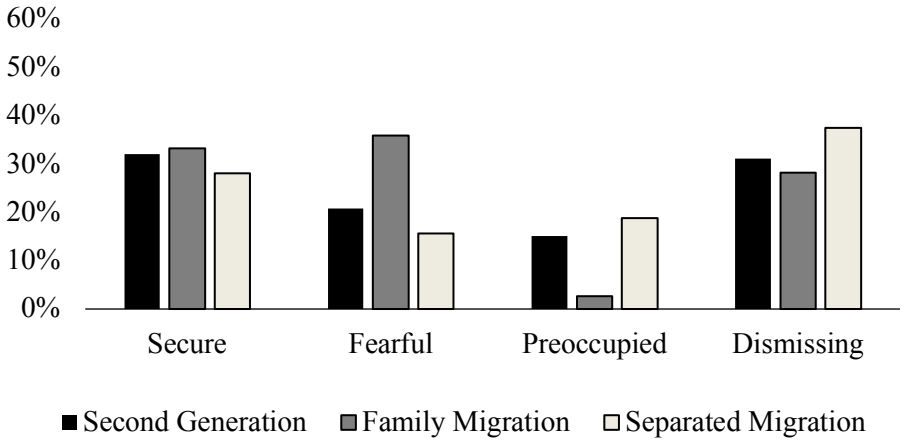

Figure 1.2 *Best-fitting attachment style by migration group*

Dimensional approach

Descriptive statistics

Consistent with the original research using this scale, the sample displayed low scores on both attachment anxiety (*M* = 1.69, *SD* = 1.05) and avoidance (*M* = 2.70, *SD* = 1.34). Table 1.8 provides the descriptive statistics on mother-related attachment anxiety and avoidance across migration groups. Separated children had more attachment anxiety than both migration groups with second generation children having the lowest mother-related attachment anxiety. Second generation had the highest mother-related attachment avoidance. Girls and younger adolescents had slightly higher attachment anxiety and avoidance.

Table 1.8. *Attachment anxiety and avoidance by independent variables*

	Attachment anxiety	Attachment avoidance
Female	1.80 (1.12)	2.84 (1.50)
Male	1.57 (0.97)	2.56 (1.15)
Younger adolescents	1.80 (1.11)	2.72 (1.39)
Older adolescents	1.53 (0.95)	2.67 (1.28)
2nd generation	1.39 (0.80)	2.87 (1.30)
Family migration	1.79 (1.18)	2.50 (1.36)
Separated migration	2.05 (1.13)	2.67 (1.38)

Attachment-related anxiety

Fifty-eight percent of the data were the minimum score of zero which is indicative of the least mother-related attachment anxiety. A linear regression was not possible given this significant skewness. Two new questions were then formulated to deal with this issue. The first question asked if there was *any* mother-related attachment anxiety present across migration groups (yes/no). A score of 1 was classified as little attachment anxiety and a score of greater than 1 classified as some attachment anxiety. A logistic regression tested for differences. The overall model was significant, χ^2 (4) = 15.01, p = .005. There was no main effect of gender or age, but a significant effect of migration group, Wald χ^2 (2) = 11.77, p = .003. Parameter estimates show that separated children are 5.83 [95% CI, 2.13, 16.02] times more likely than 2nd generation children to have some mother-related attachment anxiety, Wald χ^2 (1) = 11.74, p < .001. There were no differences observed between separated children and children of family migration, Wald χ^2 (1) = 2.83, p = .093.

The second question asked if there were differences across migration groups in the *amount* of attachment-related anxiety amongst those who scored greater than one. The small sample size (n =52) only allowed for this question to be answered descriptively. Firstly, most second generation (72%) and family migration (56%) children reported little mother-reported anxiety. On the other hand, a majority (63%) of separation children reported the same. Of the 20 separated children who reported some mother-related attachment anxiety (M = 2.68, SD = .99), most of them were male (75%). A reverse pattern was observed among the other two groups; 66% of second generation children and 82% of children who had attachment anxiety were girls. Children of family migration (n = 17) had the highest average score (M = 2.80, SD = 1.17) amongst those with some mother-related attachment anxiety while 2nd generation children (n = 15) had the least (M =

2.38, SD = .97). The average of attachment anxiety amongst those with it was 2.63 (1.04).

Attachment-related avoidance

The response ranged from 1 to 6.83 on this dimension. A univariate ANOVA measured attachment-related avoidance for mothers across migration groups. This variable was not normally distributed, and examinations of box plots revealed two outliers. Removing these outliers allowed for the assumption of normality to be observed. Two regressions were computed, one with the outliers in and out. The results did not change and so the result with the outliers retained is reported here (see Appendix for results of regression with outliers removed). The regression model was not significant, $F(4, 119) = .884$, $p = .48$, and predicted only 3% of the variance in attachment avoidance. There were no differences observed between age, gender, and the dummy coded migration variables, all ps > .05.

In general, both first-generation groups reported more attachment anxiety than the second-generation group. Regardless, a majority of adolescents from the separated migration group reported attachment-related anxiety whereas the inverse was true for the other two groups. A greater number of 2nd generation adolescents and adolescents of family migration reported little attachment anxiety. There were no differences in attachment avoidance across migration groups.

Attachment and Separated Migration

Information on the length and age of separation could be assessed for 24 children in the separated migration group. The average length of separation was 5.21 (3.44) with the minimum length of separation being 1 year and the maximum length being 12. The most frequent length of separation was 2 years (25% of sample). The average age of separation was 6.63 (4.44) with the minimum age a few months after birth to 13 years old as the latest age. There was considerable variability with the age of separation, with early life (zero) and 11 years old both constituting

12.5% of the data. Table 1.9 shows that girls were separated for less time than boys yet were separated earlier in life.

Table 1.9. *Average length and age of separation by gender*

	N	Length of separation	Age of separation
Female	8	4.50 (*4.04*)	5.50 (*3.70*)
Male	16	5.56 (*3.18*)	7.19 (*4.78*)
Total	24	5.21 (*3.44*)	6.63 (*4.44*)

Caregiver in mother's absence

Nineteen of the 31 separated children who reported information on the person who cared for them most indicated grandmother as their main caregiver, accounting for roughly 61% of the data. Aunts (16%), grandfather (10%), father (7%), brother (3%) and sister (3%) were identified as the remaining caregivers. About 71% of these caregivers resided outside of the United States at the time of data collection. The WHOTO was used to explore the relationship between separated children and these caregivers. Twenty-nine children provided full information on this. Results from the WHOTO show that that surrogate figures are present in a little capacity on proximity seeking (24%), separation distress (21%), secure base (31%) and safe haven (15%). When examining whether they are listed first, again they feature a little bit. Figure 1.3 shows the percentages listing mother compared to caregiver first on each. Showing that caregivers do not occur that often and are not the people these kids turn to. This is reflected in a Wilcoxon signed-rank test that revealed mothers had greater total scores than main caregivers ($Z = -3.002$, $p = .003$). The median score for mothers was 8.00 and the median score for main caregiver was 0.00.

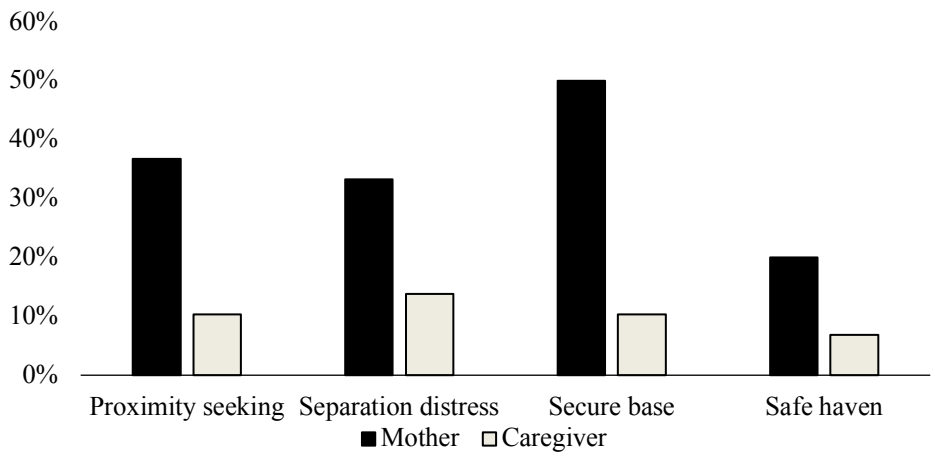

Figure 1.3 *Mother and caregiver listed first by attachment component*

A dependent samples t-test measured the difference between scores on mother-related and caregiver-related attachment anxiety and avoidance. There was no difference reported between attachment anxiety to mother ($M = 2.01$, $SE = .20$) and caregiver ($M = 1.99$, $SE = .22$), $t(30) = .09$, $p = .929$. The Pearson's correlation ($r = .36$) was significant, $p = .049$. On the other hand, separated children reported a significantly greater attachment avoidance to caregiver ($M = 3.83$, $SE = .25$) than to mothers ($M = 2.59$, $SE = .24$), $t(30) = -4.408$, $p < .001$. The Pearson correlation ($r = .33$) was not significant, $p = .075$.

Descriptive analyses revealed that children separated for four years or less had similar levels of mother-related attachment avoidance ($M = 2.42$, $SD = 1.38$) to those separated for five or more years ($M = 2.53$, $SD = 1.29$). However, those separated for less time had greater attachment anxiety ($M = 2.03$, $SD = 1.24$) than those separated for longer ($M = 1.72$, $SD = .69$). In regard to age of separation, children separated at age 4 or younger had greater attachment avoidance ($M = 2.83$, $SD = 1.59$) than those separated five years or older ($M = 2.18$, $SD = .96$). There were little differences between attachment anxiety and age of separation. The average anxiety score for children separated at younger ages was 1.85 (.92) and 1.87 (1.05) for those separated in later life.

In summary, mothers on average migrated when children were in early childhood and

children remained separated from their mothers for an average of five years. During mothers' absence, grandmothers were the main person providing care to separated children. Caregivers were rarely reported on the WHOTO measure and mothers had greater total scores, indicating that the mother relationship is stronger than the relationship with surrogate mothers. While there were no differences in attachment-related anxiety between mothers and caregivers, separated children reported greater attachment-related avoidance to caregivers.

DISCUSSION

In the Caribbean, upwards of 20 percent of children are estimated to experience separation from a parent (Dillion & Walsh, 2012). The prevalence of female-headed and single mother households together with a pattern of serial migration in this region portends that a generation of Caribbean children have spent time apart from their mothers as a result of immigration. Empirical examination of the attachment styles of Caribbean children are missing. Furthermore, we do not know much about the nature of the relationships migrant children have with migrant caregivers. The purpose of the study was to assess attachment patterns in three groups of Caribbean adolescent children using a number of attachment metrics. The methodological choice to compare children separated from their mothers (separated migration) to children who migrated with their mothers (family migration), and second-generation children who never migrated was a deliberate attempt to delineate between the effect of migration and the effect of maternal separation on patterns of attachment. A second aim of this study was to explore the nature of the relationships migrant children have with other caregivers in their families.

Children begin to depend on and find support in non-parental others as they age. However, separation distress and secure base are two attachment components that remain parent-focused until late adolescence (Hazan & Ziefman, 1994; 1999) making these components especially

relevant when examining attachment bonds in a sample of young adults. As shown in Table 1.6, only half of the adolescents from the separated migration group listed their mothers first in response to the secure base item. They were also significantly more likely than second-generation adolescents to list their mothers nowhere rather than first on the secure base item. The fact that adolescents from family migration reported their mothers first at a higher percentage than both groups on this dimension strengthens the argument that it is maternal separation due to migration, not migration itself, that contributes to a decrease in mothers as secure base for these young people. Indeed, the overall WHOTO score buttresses this conclusion. According to Hazan and Ziefmann (1994) the person listed first on every component can be considered evidence of "full-blown attachment." Seven percent of youth from separated migration report full-blown attachment to their mother. This figure is considerably lower than that of youth from family migration (26%) and second-generation youth (17%).

Additionally, over a third of separated children listed mothers nowhere on each attachment component. Previous work showed that young people who reported no one who they could turn to for support and comfort were more likely to be avoidantly attached (Hazen & Ziefman,1994). Results from the ECR-RS and the RQ suggest patterns of insecure attachment within the group of separated children. Consistent with the hypotheses of this study, separated children we more likely to have attachment anxiety compared to the other two groups (see Table 1.8). Likewise, only 28% of these young people classified themselves as secure. The research on attachment security and adolescent development has established that secure attachment leads to less risky behavior, less interpersonal conflict and better coping skills, and reduces the risk of mental health problems (see Moretti & Peled, 2004 for review). Therefore, immigrant children separated in migration may have adjustment problems due to attachment-related issues.

To my knowledge, this is the first study to provide information on the attachment of both first and second generation Caribbean immigrant children. Even though the differences between migration groups and attachment styles did not rise to the level of significance, descriptive data show that more separated children reported themselves as dismissing and more children of family migration reported themselves as fearful. One explanation for this finding may be found in the gender imbalance in each group. There were more boys in separated migration group and more girls in family migration group. These differences may therefore reflect a gender differences in attachment ratings (Bartholomew & Horowitz, 1991), though others have found no association between gender and attachment (van Ijzendoorn, 1993; 2009). Furthermore, secure attachment was not the highest rated attachment style among second-generation children who had a gender-balanced sample.

Analyses of the Adult Attachment Interview provides the most comprehensive normative estimates of attachment (Bakermans-Kranenburg & van Ijzendoorn, 2009). In non-clinical samples using a three-category classification system, 52% of adolescents were secure, 35% were dismissing and 13% were preoccupied. With the four-category classifications system the percentage of secure decreases to 44%. The authors note that the overrepresentation of dismissing attachment is normative for adolescent individuals. It is difficult to evaluate how well these estimates relate to a Caribbean sample as this region was not represented in the Bakermans-Kranenburg and van Ijzendoorn research on cross-cultural variation. What cultural factors contribute to the attachment patterns in this region is hard to determine given the limited amount of scholarship on this topic. One interpretation is that both secure and dismissing attachment styles are similar in terms of their positive appraisals of the self. Positive appraisal of self is consistent with the research that finds high self-esteem among Caribbean and Latin American immigrant

youth (Rumbaut, 1994). Future work with Caribbean and Latin American populations are necessary to increase our knowledge of attachment functioning in this understudied region.

A significant contribution made by this present study is to take into account the importance of the caregivers who support children in their mothers' absence. The current literature on left-behind children describes a conflicting role of these caregivers (Arnold, 2011a; Baptiste et al., 1997; Bragin & Pierrepointe, 2004; Glasgow & Gouse-Sheese, 1995; Pottinger et al., 2008; Suárez-Orozco, Bang, & Kim, 2011). While some children report these caregivers as second mothers (Peng & Wong, 2016), others report that the relationship is not the same as with their mothers (Dreby, 2015b). Results from this study find that youth scarcely directed attachment behaviors toward caregivers and they reported higher levels of attachment avoidance to these individuals than to mothers. Together these findings suggest that caregivers do not appear to act as a buffer against attachment insecurity, but instead seem to contribute to attachment insecurity. Interviews with transnational Mexico children illustrates that trust and affection are not the same between left-behind children and caregivers (Dreby, 2015). Strained relationships between parents and caregivers can sometimes have a negative impact on children and can lead to premature reunifications (Dreby, 2010). More work exploring what factors contribute to positive and negative relations between caregiver and child while the mother is abroad is needed to better understand these findings.

Limitations and Future Research

The present paper was motivated by the question of whether separation as a result of migration can produce changes in the attachment bond between mother and child. Even though the current context provides a strong naturalistic environment within which explore this question, it is not without its limitations. The ideal scenario would be to measure attachment *before* and

after separation from the mother in order to arrive at some evidence of causality. However, studying maternal after reunification, as this study does, is in line with Ainsworth's Strange Situation Paradigm from which we know that the reunion episodes provided a better identification of attachment patterns than the separation episodes (Ainsworth et al., 1973). For separated children, disappointment is typically reported when they are reunited with their migrant mothers (Arnold, 2006), in part because children often fantasize about their absent mothers and hold unrealistically high expectations (Bragin & Pierrepointe, 2004). Therefore, though we are not able to see what occurs during the separation, what is revealed at reunification may be sufficient to speak to the quality of the attachment relationship that may have been changed by the separation. The findings provide clear evidence that these young people have a different attachment organization than other migrant children and non-migrant youth of similar cultural background.

Cognitive advancements help with the interpretation of the parent's behaviors (Bretherton & Munholland, 1999). Age is expected to moderate the relationship between maternal separation and attachment security. Children separated in early life may not understand mothers' reasons for leaving and may be more likely to see her absence as abandonment. Children separated later in life may be able to see the separation as a necessary for the family's economic well-being. Due to the focus of this study on adolescents within a narrow age range, this study was not designed to explore these hypotheses. Follow-up studies may seek to explore the effect of age on children's reactions to mother absence and what consequence it has for attachment security. In this sample, information on the age of separation was only available for 24 of the separated children; 14 youths were separated at age eight or younger while eight youths were separated at age nine or older. Among those separated in early life, none listed their mother first on all dimensions of the WHOTO whereas roughly 36 percent placed their mothers nowhere on each dimension. On the other hand,

of those separated later in life roughly 13 percent listed their mother first on each and the same percentage listed her nowhere on each dimension. Although these are no more than descriptive estimates, they provide some evidence that age at separation is an important variable to consider in future research.

Additional work should also investigate the role of communication during separation. Communication with migrant parents has been linked to subjective well-being of left-behind children (Graham et al., 2012; Graham & Jordan, 2011). Moreover, attachment in later life is maintained by open and safe communication (Kobak & Madsen, 2008). One future study may seek to explore the relationship between communication during and after separation on the attachment security of separated children. An alternative, but similarly fruitful approach could be to investigate whether open communication plays a role in separated children who report themselves as secure.

The limited work on adolescent attachment is reflected in the lack of measurements that are appropriate for this age group (Gander, George, Pokorny, & Buchheim, 2017). Given adolescence is a time of great change, some measures are better suited for younger adolescents (Brenning, Soenens, Braet, & Bosmans, 2011). This sample had a wide range of adolescent children and so measures were selected that could cover a broad age range. Future work might want to limit the age range so that the attachment measures used are specifically designed for that period of adolescence. Furthermore, use of a narrative-based attachment measure may help to inform us about the way separated children construct their perception of their mothers (Dykas, Woodhouse, Cassidy, & Waters, 2006). The AAI may be a useful measure, especially to explore whether separated children report not remembering how they felt during the separation and whether they focus their narratives away from attachment related experiences as has been shown

in samples of dismissing children (Main et al., 2005).

Future work may also want to investigate in more depth the characteristics of the separation experience that might contribute to mother's abilities and opportunities to provide a secure base for these youths. Markers of secure base in mother-adolescent relationships include mother's support, mother's knowledge of the youth's self-perception, adolescents' deidealization of mothers, and safety and autonomy during disagreements (Allen et al., 2003). Future researchers may want to identify the factors that are relevant for separated children and their mothers. This study did not assess the mental health of youth's mothers however given the links between attachment security and maternal mental health (Atkinson et al., 2000), and the fact that mothers separated from their children due to migration are at a greater risk of depression (Miranda, Siddique, Der-Martirosian, & Belin, 2005), this is another area of research that may help to further understand the factors affecting the quality of attachment relationship between separated mothers and children. The nature of the mothers' relationships with the caregivers of the left-behind children would be an important variable to include in future investigations.

Finally, the study joins the chorus of other scholars calling for immigration policy to consider migrants as part of a larger family unit rather than as individuals only (Dreby, 2015a; Enchautegui & Menjívar, 2015). The results of these studies show that the relationship between mother and children are comprised as a result of what Dreby (2015b) terms "separation due migration constrained choices". It is imperative that immigration policies do not create a context in which families have to make difficult decisions about the structure and organization of their families that can lead to long-term consequences that stretch far beyond any border.

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CHAPTER 3

FAMILY MATTERS: ATTACHMENT AND PARENTING AS PREDICTORS OF MENTAL HEALTH IN A SAMPLE OF CARIBBEAN IMMIGRANT TEENS

INTRODUCTION

The social, economic, and political factors that impact the immigrant population in the United States may leave immigrant children vulnerable to experiencing mental health problems. The post-migration stress hypothesis suggests that recent migrants face immediate mental health challenges which fade as they adapt to life in a new society (Brown, Cohen, & Mezuk, 2015). On the other hand, some have found support for an immigrant paradox in mental health (Harker, 2001). A recent study found that immigrant adolescents who have lived in the United States for more than ten years, regardless of citizenship, had significantly greater emotional difficulty than those who have resided in the country for five years or less (Filion, Fenelon, & Boudreaux, 2018). Similarly, participation in risky behaviors increased with time spent in the United States (Perreira & Ornelas, 2011). Recent immigrant children were significantly less likely to use substances than native-born youth. However, there were no differences in smoking marijuana and cigarettes between native-born children and foreign-born children who have lived in the country for more than a decade (Perreira & Ornelas, 2011). These heterogeneous mental health patterns among migrant youth suggest that one or more factors may be moderating the nature of the immigrant experience for the well-being of youth. For example, perhaps the nature of their interpersonal relationships with their primary caregiver(s) and other sources of social support such as peers or romantic partners may play an important role in adjustment to migration. Age, gender, and sociocultural background likewise might prove salient in adjustment to life in a new society.

Some research suggests that the immigrant advantage in mental health is attributable to protective family characteristics such as family cohesion, parental warmth (Mood, Jonsson, & Låftman, 2016), and parental supervision (Harker, 2001). Indeed, family factors continue to be one of the most predictive set of variables associated with the psychological outcomes immigrant adolescents (Kouider, Koglin, & Petermann, 2015; Harker, 2001; Mood et al., 2016; Patel, Clarke, Eltareb, Macciomei, & Wickham, 2016; Perreira & Ornelas, 2011; Rumbaut, 1994). In much the same way that family factors act as a buffer against mental health problems, the alternative can also be true. For example, parental conflict is negatively related to self-esteem and depressive symptoms of immigrant adolescents (Rumbaut, 1994). Parenting practices including harsh discipline and monitoring have been associated with a higher prevalence rate of mental disorders, particularly among Asian immigrant children (Kouider et al., 2015).

These findings speak to the significant role of family life in either supporting or undermining positive mental health outcomes for immigrant youth. Pre-migration family factors also play a decisive role in the lives of immigrant children (Adserà & Tienda, 2012; Ornelas & Perreira, 2011; Perreira & Ornelas, 2011). Parents from Mexico and other parts of Central America undertake difficult and often traumatic migrations to the United States. Their decision to leave children behind in the care of trusted family members is a protective strategy that reduces the likelihood of children experiencing trauma during the migration trip and reduces the risk of PTSD (Perreira & Ornelas, 2013). Although the decision to separate from children is often a rational one made by migrant parents (Dreby, 2015), it is not without its problems. One study to look more broadly at the Caribbean and Latin America found parental separation was correlated with greater distress for children (Yearwood, Crawford, Kelly, & Moreno, 2007).

The Caribbean is one region that has many children who are affected by migration-induced

maternal separation (Dillon & Walsh, 2015). Immigrant children from the Dominican Republic, Haiti and Jamaica have been shown to have high levels of maternal absence due to mother migration (Cassells, 2015; Smith, Lalonde, & Johnson, 2004; Suárez-Orozco, Bang, & Kim, 2011). Despite their development outcomes being a topic of interest since the 1990s, there has not been sustained research in this area. Comprehensive studies of the mental outcomes of these children after they arrive to the United States are lacking (Dillon & Walsh, 2012). One study found that self-esteem was lower for children after reunion and that these children often feel "unloved" and "unaccepted" (Smith et al., 2004). In general, the majority of the research focusses on their adjustment during separation and what has been consistely shown is that children endure psychological hardship as a result of maternal separation.

Left-behind children express substantial feelings of loneliness and tend to withdraw from friends and social activities (Jingzhong & Lu, 2011; Lemy, 2000; Pottinger, 2005). One study found that while father separation showed an indirect link to negative peer relations, there was a direct negative effect of mother separation on their children's peer relationships (House, 2009). Suicide ideation also occurs among these children (Gao et al., 2010) and sometimes they act out instead of internalizing their feelings (Gao et al., 2010; Hewage, Bohlin, Wijewardena, & Lindmark, 2011). Poor behavior is sometimes a way for left-behind children to wield their power (Dreby, 2007, 2010), or as a way to gain attention and express dissatisfaction with their current caregivers (Mitrani, Santisteban, & Muir, 2004). An important limitation in most prior research on migration and offspring mental health is lack of careful analysis of sources of heterogeneity in the mental health sequelae of migration-induced mother child separation.

This study explores how various migratory experiences contribute to the mental health outcomes of Caribbean immigrant teens. Particularly, I examine whether maternal separation

produces differential mental health outcomes between children who experienced separation, foreign-born children without separation and second-generation children who never migrated. Additionally, given parenting practices in the Caribbean and the high rates of maternal separation in that area, a study that examines the effect of parenting and attachment on mental health has potential to contribute to a more nuanced understanding of adolescent mental health and the migration experience. Caribbean immigrant children separated in migration have been shown to have attachment-related issues (Arnold, 2006, Cassells, forthcoming). As it relates to parenting, descriptions of normative Caribbean parenting styles suggest authoritarian parenting is the most common (Brown & Johnson, 2008), with little emphasis on play or communication (Grantham-McGregor, Landman, & Desai, 1983). Caribbean parents tend to use corporal punishment and other harsh discipline measures (Brown & Johnson, 2008). As is the case for other children (Achtergarde, Postert, Wessing, Romer, & Müller, 2015; Darling & Steinberg, 1993) structure with democratic parenting practices was related to positive outcomes for Caribbean children (Griffith & Grolnick, 2014).

Research on the mental health of Caribbean immigrant teens is lacking. The chief purpose of this study is to fill this gap. This paper builds upon this goal by exploring the independent contribution of parenting and attachment to the mental health outcomes of Caribbean immigrant children as well as examining their relative contributions. This paper also goes a step further by examining three groups of immigrant children— second generation, children of family migration, and children of separated migration— in an effort to delineate the impact of maternal separation on mental health outcomes. To these ends, the paper is organized in the following way. First, I provide a theoretical background on attachment and parenting and a review of relevant literature connecting each to adolescent mental health outcomes. The paper then covers the methodology,

results and a discussion of important findings.

THEORETICAL BACKGROUND AND LITERATURE REVIEW

Attachment and mental health

The link between attachment and mental health can be traced to the origin of Bowlby's initial writings (Bowlby, 1951). In his observations of infants, he and John Robertson identified an organized pattern of responses displayed by infants when faced with separation from a primary caregiver. These include initial protest, a period of despair, and then detachment (Bowlby, 1960). According to Bowlby's attachment theory, separation anxiety is hardwired into the survival instincts of human beings such that fear is activated when faced with separation from a primary caretaker (Bowlby, 1973). Separation from attachment figure produces great distress because it is seen as a potential threat to survival. For this reason proximity maintenance, or remaining close to an attachment figure, was presented as the primary goal of the attachment behavioral system (Bowlby, 1969/1982). Bowlby argued that if separation anxiety is allowed to persist, then the individual may develop defense mechanisms that carry long-term consequences for mental health. In other words, while the behaviors associated with separation anxiety are normative, they are best served in the short term.

Observations of human infants led to a definition of proximity maintenance in its most literal sense (i.e. presence or absence of an attachment figure) (Bowlby, 1969/1982). However, this view has evolved since Bowlby's path-breaking ideas in favor of a lifespan perspective to attachment (Hazan & Campa, 2013; Kobak & Sceery, 1988; Sroufe & Waters, 1977). Developmental changes bring greater independence and self-sufficiency. With this in mind Bowlby writes, "nevertheless for a person to know that an attachment figure is available and responsive gives him a strong and pervasive feeling of security, and so encourages him to value

and continue the relationship," (Bowlby, 1988, p. 27). This "knowing" is the internal working model at work (Bowlby, 1973). The internal working model is a cognitive map containing our experiences with important others that informs about their accessibility and supportiveness, as well as about our own acceptability in the eyes of these individuals (Bretherton, 1987). These are complementary systems that not only influence our attachment styles but also carry implications for mental health throughout life.

Attachment defined in terms of "felt security" broadens the conceptualization of attachment behaviors across the lifespan and emphasizes the affective components that drive attachment behaviors. These are essential for understanding the use of attachment figures as a secure base during times of stress (Sroufe & Waters, 1977; Waters & Cummings, 2000). A critical function of the attachment behavioral system is to alleviate distress through contact and comfort with an important other. Therefore, affect regulation develops within the context of caregiver responsiveness in stressful times (Kobak & Sceery, 1988). In this way, the attachment behavioral system has been implicated in affect regulation (Sroufe & Waters, 1977).

Mikulincer and Shaver (2010) advanced a model of attachment system activation and functioning in adulthood that builds upon Bowlby's early writings. Their model explains what happens when the set goal of the system is or is not achieved, and subsequent variation in attachment behaviors and strategies. First, the system is activated when an individual appraises a threat in the environment. The primary strategy is to seek proximity to attachment figure. If the attachment figure is available and responsive, then the individual is relieved and can return to activities. On the other hand, attachment figure unavailability and unresponsiveness require the use of secondary strategies—hyperactive and deactivating.

The choice between a hyperactive or deactivating strategy is based on the relationship

history with the caregiver (i.e. the internal working model) and the viability of the proximity-seeking as a set goal. Hyperactivating strategies are used in cases were the attachment figure is unpredictable or inconsistent. This leads an individual to intensify their behaviors and exaggerate their distress in an effort to garner care and support from their loved one. These individuals are at risk for developing emotional problems and may have a negative self-image. On the other hand, deactivating strategies are used in cases where there is a pattern of unresponsiveness from the attachment figure. These individuals tend to suppress their negative emotions. Taken together it becomes clear that the quality of attachment relationship can lead to different patterns of psychological adjustment. According to Bowlby, attachment bonds play a key role in the development of positive or negative mental health (Bowlby, 1988).

Research on the relation between attachment and psychopathology in adolescence has been covered in depth (Davies & Sturge-Apple, 2014; Kobak & Sceery, 1988; Rosenstein & Horowitz, 1996). For example, securely attached adolescents reported low anxiety and better coping behavior. On the other hand, preoccupied children were found to have the highest levels of anxiety and peers rated children classified as dismissing as hostile and lonely (Kobak and Screey 1988). Similar results were found in a group of young adolescents (Bartholomew & Horowitz, 1991) in addition to a negative relationship between secure attachment and interpersonal problems. Less work has been done with an immigrant adolescent population, and even less has been done with a group of once separated immigrant children.

Parenting and mental health

Similar to the attachment system, parenting has its own organizational structure consisting of behaviors, practices, and styles that combine to create a parenting context for children (Darling, & Steinberg, 1993). Our understanding of these interrelated components stems from the

groundbreaking work of Diana Baumrind. Her examination of control and its relationship to parenting practices and child behavior still informs research today (Baumrind, 1966, 1967, 1971, 1978). The degree of control determines the style in which a parent will approach providing nurture and discipline. On the low side of control there is the permissive parent who gives near full autonomy to the child to do as s/he desires. Little demands are made upon the child and a nonpunitive approach to correction is utilized. On the high side of control is the authoritarian parent who exerts substantial control over the child, providing strict guidelines for behaviors with the expectation of full compliance. Punitive measures are used to achieve obedience. In the middle of these two diametrically opposing ends is the authoritative parent who encourages self-will and self-expression but uses control when necessary to teach proper behavior. There is a balance of power but with a clear understanding that the parenting is an authority figure (Baumrind, 1966).

A typology of parenting styles was created using a matrix model with dimensions of parental responsiveness and demandingness. The result are four parenting styles: authoritative, authoritarian, indulgent, and neglectful (Maccoby & Martin, 1983). *Authoritative* parents are demanding and responsive. They have clear expectations of children's behavior and provide directive support to facilitate said behavior. They utilize supportive discipline and foster cooperation and self-regulation in their children (Baumrind, 1991). *Authoritarian* parents are more demanding than they are responsive. They emphasize rules and structure, with an expectation of undisputed obedience. Their children are heavily monitored, and unilateral communication is underscored. In these households parents have the power and children must follow orders often to the detriment of self-regulation and agency (Baumrind, 1991). *Permissive* parents, also known as indulgent, are more responsive than demanding. They are considerably lenient and non-directive. Although they are very engaged with their children and give them a great deal of

freedom, they do not intervene to discipline children, which would help foster mature behavior (Baumrind, 1991). *Neglectful* parents, also known as rejecting or uninvolved, are neither demanding nor responsive. They seem to forfeit the responsibilities of parenting and provide little guidance or support to their children (Baumrind, 1991).

In their parenting model, Darling and Steinberg (1993) explain that the manner in which parents express their goals and values (e.g. tone, body language) moderates the relationship between parenting practices and adolescent outcomes. Parenting style is defined as "a constellation of attitudes toward the child that are communicated to the child and that, taken together, create an emotional climate in which the parent's behaviors are expressed" (Darling & Steinberg, 1993, p. 488). Expanding on the importance of the emotional climate, early work by Bronstein, Fitzgerald, Briones, Pieniadz, and D'Ari (1993) found that family emotionality, understood as emotional expressiveness and acceptance of emotions, predicted adolescent adjustment. Cross-cultural work shows that though cultures vary in where and for what purpose emphasis is placed on a certain parenting goal or value, psychological control, often associated with an authoritarian style, leads to maladaptive child outcomes (Bornstein, 2013). Research on parenting styles and child development consistently finds that authoritative parenting contributes to favorable child development, particularly due to the warmth and support children receive (Achtergarde et al., 2015).

Attachment and parenting

Bowlby articulated two caregiver attributes, availability and responsiveness, as essential in the development of individual differences in attachment (Bowlby, 1988). Both systems seem to be concurrently activated suggesting an inextricable relationship between parenting and attachment. For example, harsh parenting that uses threats of abandonment as a form of discipline

may threaten the attachment bond (Kobak, 1999). Likewise, alterations in the caregiving environment leaves the attachment relationship open to change as well (Cummings & Cummings, 2002). De Wolff & van Ijzendoorn (1997) found a significant, positive association between attachment and parenting sensitivity. Recently, Doinita and Maria (2015) found that secure attachment is significantly correlated with authoritative parenting style. Likewise, fearful-avoidant attachment and permissive parenting were significantly correlated.

With parental behaviors well-established as antecedents of attachment, intervention efforts target the improvement of parenting behaviors as a way to increase attachment security (Juffer, Bakermans-Kranenburg, & van IJzendoorn, 2008). In a study with French-Canadian children, three dimensions of parenting (involvement, autonomy, and behavioral control) were compared to children's attachment style. Results showed that children's reports of parenting style received was significantly related to independent observation of child's attachment pattern, such that warm involvement, encouragement of autonomy, and behavioral control, were all positively related to secure attachment. The results were consistent across middle childhood and adolescence (Karavasilis, Doyle, & Markiewicz, 2003).

One study with Iranian adolescent children (Zeinali, Sharifi, Enayati, Asgari, & Pasha, 2011) found that authoritative and permissive parenting were both significantly related secure attachment. These children with secure attachment were at a decreased risk of developing an addiction due to higher levels of self-regulation. The inverse was found for authoritarian and neglectful parenting. Furthermore, Iranian children had attachment insecurity and were at greater risk of developing an addiction due to lower levels of self-regulation (Zeinali et al. 2011). The results suggest that secure attachment and its positive impact on self-regulation both mediate the relationship between parenting and addiction susceptibility. In the same way, Alonso-Arbiol,

Abubakar, & Van de Vijver (2014) found that attachment mediated the relationship between perceived parenting and adolescent wellbeing. These findings taken together suggest that parenting and attachment work in tandem to effect mental health. What remains unknown is whether each provide unique effects to the mental health of young adults, or if one accounts for a greater portion of the variance in mental health. Moreover, how these processes play out within the context of immigrant youth is unknown.

There have been some studies examining the relative importance of parenting and attachment in terms of adolescent mental health (Doyle & Markiewicz, 2005; Ebrahimi, Amiri, Mohamadlou, & Rezapur, 2017; Körük, Öztürk, & Kara, 2016). In a sample of Turkish undergraduate students, Körük et al. (2016) showed that both perceived parenting and attachment predicted an equivalent amount of variance in depression (16%) and anxiety (17%). Attachment to parents predicted more of the variance in negative-self view, while parenting received accounted for slightly more variance in somatization and hostility. Overall, the attachment factor of protection acted as a buffer against psychopathology whereas parenting factors like pessimistic or fearful mother and overprotective/worrying father increased psychological symptoms. Another study using university Masters' level students explored the relationship between parenting styles and attachment styles (Ebrahimi et al., 2017). Parenting styles accounted for 12% of the variance in depression. The model was improved to 20% by the addition of attachment variables.

Furthermore, attachment anxiety positively predicted internalizing and negatively predicted self-esteem in adolescents over time (Doyle & Markiewicz, 2005). Attachment avoidance was only negatively related to self-esteem, suggesting that while both contribute to one' sense of self, attachment anxiety leads to other psychological symptomology. In regard to parenting, psychological control was the only variable found to predict internalizing over time.

These findings support the conclusion that though parenting and attachment both relate to psychological distress, they each make some unique contributions to adolescent well-being.

THE CURRENT STUDY

The primary aim of the present study is to assess the psychological adjustment of Caribbean immigrant adolescents. Not only will this study be able to provide information on an understudied population, it will also be able to explore whether differences in the migration experiences of adolescent Caribbean matters for parenting, attachment, and mental health. As previously mentioned, maternal separation as a result of immigration significantly impacts families from the Caribbean. This study seeks to shed light on the mental health outcomes of this group of children. Children separated in migration are predicted to score lower on measure of psychological health compare to children who migrated with their mothers (family migration) and those who never migrated (2nd generation children).

The present study also seeks to build on the work of previous studies by looking at the predictive power of attachment and parenting on mental health in a sample of Caribbean immigrant teens. It is important to see if what has been shown before extends to Caribbean families, especially in light of data indicating a predominance of authoritarian parenting practices. Attachment and parenting variables will be first examined separately to address their unique contribution, then together to see which is most significant. In line with previous research, parental control and attachment anxiety are hypothesized to contribute negatively to adolescent mental health. No a priori hypothesis on which is the most significant predictor is offered.

A final aim of this study is to explore whether maternal attachment security functions as a mediator in the relationship between migration group and mental health. Previous work has shown that children with different migration experiences have different attachment security (Cassells,

forthcoming). Therefore, the present study examines whether expected differences in mental health between the three adolescent migration groups will be due to differences in attachment security.

METHOD

Participants and Design

This cross-sectional study was designed to explore the influence of parent-child relations on the mental health of three different groups of immigrant children. A hundred and twenty-five (125) Caribbean immigrant teenagers, ages 14 to 19, were recruited primarily from two afterschool programs in the Bronx and in Westchester County, New York State. One participant is excluded from analysis due to incomplete portions of the demographic survey. Fifty-three were second-generation immigrant children, 39 migrated with their mothers (family migration) and 32 migrated apart from their mothers (separated migration). The average age of the participants in the sample was 16 years old (M = 16.19; SD = 1.26), though second-generation children were younger (M =15.75, SD = 1.30) than children of family (M = 16.41, SD = 1.04) and separated (M = 16.66, SD = 1.23) migration. There was an even divide between males and females (n = 62) in the overall sample, however, some gender imbalances exist within in the foreign-born groups. There were more girls in the family migration group and more boys in separated migration group (see Table 2.1). Age and gender are included as covariates in analyses.

Recruitment. Participants were recruited on the basis of their migration experience, with children fitting into one of three migration groups. (1) *Second generation*: U.S. born children of immigrant (2) *Family migration*: foreign-born children who migrated to the U.S. at the same time as their mothers (3) *Separated migration*: foreign-born children who migrated to the U.S. apart from their mothers. In all but one cause children migrated to the U.S. after mothers. All of the

second generation and family migration participants were recruited from a high school afterschool program in the Bronx. In addition to being recruited from this location, some of the participants in the separated migration group were recruited from a high school afterschool in Westchester County. Few participants from this group were also recruited using a snowball sampling technique.

Eligibility. Youth were identified by the afterschool director as potentially meeting the inclusion criteria. A formal eligibility screening was conducted by the afterschool director or the principal investigator. The inclusion criteria are as follows: (a) youth between the ages of 13-19 (b) foreign-born or U.S.-born to Caribbean parents. Eligible Caribbean countries included the 13 sovereign nations (Antigua and Barbuda, The Bahamas, Barbados, Cuba, Dominica, Dominican Republic, Grenada, Haiti, Jamaica, Saint Kitts & Nevis, Saint Lucia, Saint Vincent and the Grenadines, Trinidad & Tobago), as well as Guyana, (c) English proficiency (d) youth must currently live with mother (e) mother migrated from country of birth to U.S. (no pattern of repeated migrations).

Table 2.1 *Demographic characteristics*

	2nd generation (***n*** **= 53)**	Family migration (***n*** **= 39)**	Separated migration (***n*** **= 32)**
Child characteristics			
Female	52.80	61.50	31.00
Young adolescents	69.80	48.70	46.90
Nativity			
Antigua & Barbuda	-	-	3.10
Dominican Republic	-	35.90	21.90
Guyana	-	15.40	6.30
Haiti	-	2.60	-
Jamaica	-	46.20	68.80
Mother characteristics			
Age	45.72 (6.79)	42.62 (6.67)	41.45 (5.88)
Married	56.60	48.70	31.30
Educational attainment			

Less than high school	7.00	19.40	12.00
High school/GED	34.90	25.00	44.00
Some college	27.90	41.70	24.00
Bachelor's degree +	30.20	13.90	20.00
Nativity			
Antigua & Barbuda	-	-	3.10
Dominican Republic	22.60	35.90	21.90
Guyana	13.20	15.40	6.30
Haiti	-	2.60	-
Jamaica	54.70	46.20	68.80
Saint Kitts & Nevis	5.70	-	-
Saint Lucia	3.80	-	-
Family characteristics			
Child lives with biological mother and father	47.20	41.00	6.30
Child lives with biological mother and stepfather	9.40	2.60	21.90
Child lives with mother and mother's partner	1.90	5.10	6.30
Child lives with mother alone	41.50	48.70	62.50
Child alternates living with mother and father	-	2.60	3.10
Father lives abroad	3.80	20.50	45.20
Child eligible for free/subsidized lunch	73.50	91.90	86.70

As shown in Table 2.1, majority of the sample was of Jamaican (56%) and Dominican (26%) descent and classified themselves as either lower-middle class (37%) or working class (44%). More than half (57%) of the participants did not currently live with their biological fathers with 19% of their fathers residing abroad. Youth in the sample indicated economic improvement as the chief reason for their mothers' migration to the United States. Overall, the average age reported by youth for their mothers was 43.57 (*SD* = 6.73) and many of the mothers were reported

as earning a high school degree and attending some college. Table 2.1 provides a breakdown of the demographic information of children and their families across the three migration groups. Table 2.1 also includes information on a categorical age variable that was created due to the uneven age distribution in the sample. Most of the sample (57%) were younger adolescents, ages 14 to 16.

Procedure

The project protocol was reviewed and approved by the Cornell Institutional Review Board. Both parental consent and child assent were obtained. Youth were invited to a classroom where they were given a unique ID number. Youth were given access to the Qualtrics survey that contained a demographic questionnaire and study measures. After completion of the Qualtrics survey participants completed a paper-version of the Strengths and Difficulties Questionnaire. At the end of the study each participant was debriefed and compensated $20 for their time.

Materials

The Authoritative Parenting Scale is a measure of authoritativeness including three subscales with nine questions on parental involvement, nine questions on parental autotomy-granting, and eight questions related to strictness and supervision. The measure can be used to create the categorical parenting styles of authoritative, authoritarian, indulgent (or permissive), and neglectful (see Steinberg, Lamborn, Darling, Mounts, & Dornbusch, 1994). The measure can also be used to create a categorical measure of authoritativeness (Steinberg, Lamborn, Dornbusch, & Darling, 1992). Each parenting characteristic is on a continuous scale. The involvement subscale (α =.83) and the autonomy granting subscale (α = .70) are both on a scale of 9 to 36. The original supervision subscale included two items about weekday and weekend curfews. These items did not load with the other items and were dropped. The supervision subscale now consists of 6 items

(α = .75). These alpha coefficients are consistent with those reported in the original study (Steinberg et al. 1994) which ranged from .72 to .82 across all three dimensions.

The Strengths and Difficulties Questionnaires (SDQ) is a child mental health questionnaire consisting of 25 questions and five subscales (α = .75). A youth self-report version (Goodman, Meltzer, & Bailey, 1998) was developed with slightly different phrasing. Youth answer each question on a three-point scale of "Not True" "Somewhat True" and "Certainly True." Not True is coded as zero, somewhat true as one, and certainly true as two. Positively worded items are reversed scored and higher scores relate to more difficulties. The five subscales are emotional symptoms, conduct problems, hyperactivity/inattention, peer relationship problems, and prosocial behaviors. The first four subscales create a total difficulties score (α = .65). The prosocial subscale was not included in analyses. A nationwide epidemiological study found evidence of strong reliability (α = .80) for the total difficulties score of the self-report SDQ, as well as an adequate correlation (r = .62) between total difficulties scores at baseline and 4 to 6 months later (Goodman, 2001). The odds ratio of high scores on the SDQ and an increased risk of psychiatric disorder was roughly 6 for the self-report SDQ, indicating it as a valid measure.

The Experience of Close Relationships-Relationship Structures (ECR-RS) questionnaire is a self-report measure of attachment across a number of close relationships (Fraley, Heffernan, Vicary, & Brumbaugh, 2011). The nine-item scale (α = .84) generates two scores, one for attachment-related anxiety and another for attachment-related avoidance. The measure allows for domain-specific attachment patterns to be assessed. Respondents completed the ECR-RS about their attachment relationship with their mothers. In adult (Fraley et al. 2011) and adolescent (Donbaek & Elklit, 2014) samples there is high internal reliability for each subsample (alpha values greater than .80). Donbaek and Elklit (2014) found strong discriminant and convergent

associations between the ECR-RS and the RQ.

RESULTS

Descriptives

Only 51.6% of the sample could be categorized into the four prototypical parenting styles (Baumrind, 1991). The remaining participants could not be classified using the typical categorization system outlined by Steinberg and his colleagues (1994). Based on this subsample of 64 youth, about 39% of youth reported their mother as authoritative, 12.5% reported her as authoritarian, 10.9% reported her as indulgent and 37.5% reported mothers as neglectful. Figure 2.1 shows the distribution based on migration group. For youths in the 2nd generation ($n = 26$) and family migration ($n = 21$) groups, mothers were reported as either authoritative or neglectful, while for youth in the separated migration group ($n = 17$), mothers were reported as slightly more neglectful.

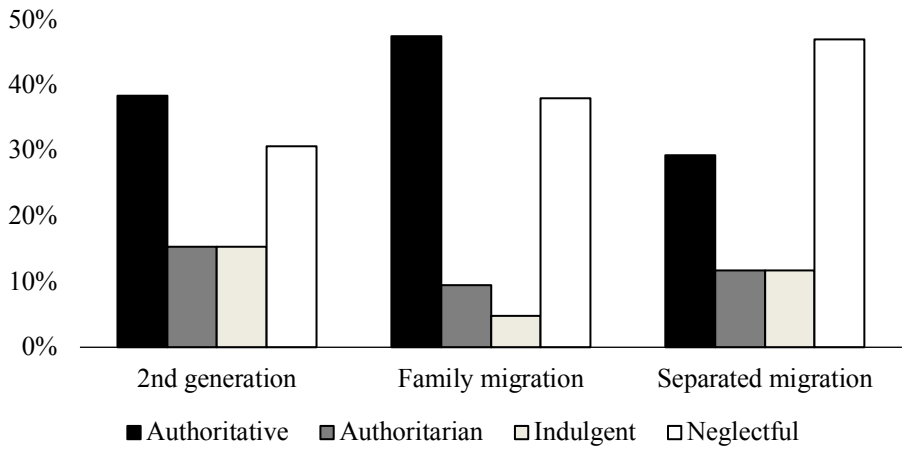

Figure 2.1 *Parenting styles by migration groups*

The measure of authoritativeness captured a 100% of the responses. Overall, a low percentage of youth's mothers were categorized as authoritative (10.50%). Most of the sample

reported their mothers as somewhat non-authoritative (35.50%), non-authoritative (27.40%), or somewhat authoritative (26.60%). Figure 2.2 illustrates maternal authoritativeness across migration groups. Both 2nd generation and separated migration reported their mothers as somewhat non-authoritative, while children of family migration had an even distribution across all three styles. Figure 2.2 also shows that while authoritativeness is low across all groups, none of the children from the separated migration group reported their mothers as authoritative.

A chi-square test found no relationship between gender and authoritativeness, χ^2 (3, N = 124) = .107, p =.991, age and authoritativeness, χ^2 (3, N = 124) = .283, p =.963, or eligibility for free/reduced lunch and authoritativeness, χ^2 (3, N = 124) = 1.898, p =.594. There was a violation of expected count in one cell of the crosstabulation for free/reduced lunch and authoritativeness (count of 2 vs. expected count of 2.24). This violation is not significant (Field, 2005). A chi-square test with the migration group variable could not be conducted because there were no children from the separated migration group whose mothers were classified as authoritative.

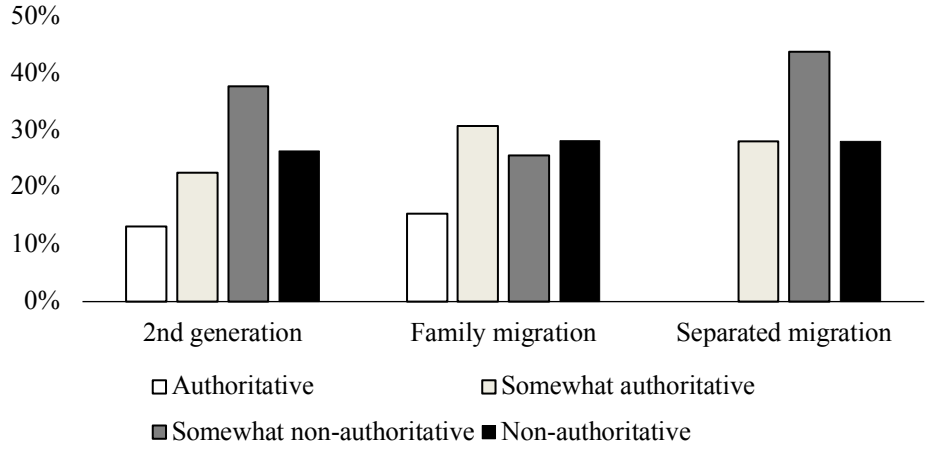

Figure 2.2 *Authoritativeness by migration groups*

Parental characteristics

Parental involvement (M = 28.43) and supervision (M = 16.02) were high among youth in

the sample while autonomy-granting (*M* = 21.59) was medium levels. Table 2.2 provides descriptive information on the three parenting characteristics across variables in this study. There were no mean differences in parental characteristics by the control variables (gender, age, and poverty status), all *p*s > .05. Involvement was the only parental characteristics with mean variation across the chief independent variable (migration group).

Table 2.2. *Descriptive statistics of parental characteristics by study variables*

Variable	M(*SD*)		
	Involvement	*Autonomy-granting*	*Supervision*
Migration group			
2nd generation	28.94 (*4.23*)	21.69 (4.28)	16.10 (*1.91*)
Joint migration	29.10 (*4.57*)	21.95 (*4.71*)	16.31 (*2.18*)
Separated migration	26.75 (*6.00*)	21.00 (*4.22*)	15.53 (*2.59*)
Gender			
Female	28.55 (*4.63*)	22.26 (*3.86*)	15.98 (*2.08*)
Male	28.31 (*5.21*)	20.94 (*4.78*)	16.05 (*2.32*)
Age			
14- to 16-year-olds	28.44 (*5.12*)	21.87 (*4.29*)	16.00 (*2.25*)
17- to 19-year-olds	28.41 (*4.66*)	21.23 (*4.51*)	16.04 (*2.14*)
Poverty status			
Yes	28.48 (*4.83*)	22.00 (*4.19*)	16.09 (*2.22*)
No	28.75 (*5.52*)	20.11 (*5.07*)	15.40 (*2.23*)

A linear regression was employed to test how migration group was related to parental involvement. Age and gender were included in the model because of their relationship to migration group. Variation inflation factor showed multicollinearity was not violated. Inspection of Q-Q plots showed that the residuals were not normally distributed and that several outliers were present. Given the significant right skew, -1.03 (*.22*), only the removal of outliers resolved the violation. Two models were conducted, one with the outliers removed and another with the outliers retained, in order to examine what impact the outliers had on the regression slopes. Similar conclusions are

drawn from both models and so the model with the outliers removed is presented (see Appendix for the results with the outliers retained). The overall model was not significant, $F(4, 115) = 1.61$, $p > .05$ and accounted for only 5% of the variation in parental involvement. However, beta coefficients showed children of separated migration have significantly less parental involvement compared to 2nd generation children and children of family migration (Table 2.3). The dummy variable comparing 2nd generation children to children of family migration was not significant (not shown). The Cohen's *d* is .40 is indicative of a medium effect.

Table 2.3. *Linear regression analysis with migration group predicting parental involvement*

Variable	*B*	*SE B*	*β*
Gender	0.44	0.81	.05
Age	-0.40	0.82	-0.05
2nd generation	2.09	0.97	0.25*
Family migration	2.27	1.03	0.25*
R^2		0.	

Dummy variables used separated migration as reference group. * $p < .05$.

Mental Health

Table 2.4 shows the means and standard deviations of total difficulties score by the study variables. A one-way ANOVA showed that gender is significantly related to mental health, $F(1, 122) = 8.48$, $p < .01$, girls reported greater total difficulties than boys. None of the covariates variables had a significant impact on mental health, all $p > .05$. There was also no direct effect of migration on total difficulties score, $F(2, 123) = .825$ $p = .44$.

To answer the research question of whether parenting style or attachment style accounts

for more variance in total difficulties score, two hierarchical linear regression measured differences in the total difficulties score by each. In both analyses, gender was entered in block 1 as a control variable. Casewise diagnostics identified values three standard deviations from the mean. The models were run with the outliers retained and with them removed. Even though outliers had no impact on the regression slope, the results of the model with the outliers removed is presented. The results of the model with the outliers retained is presented in the Appendix.

Table 2.4. *Mean and standard deviations of total difficulties scores*

Variable	M(*SD*)
Migration group	
2nd generation	9.45 (4.88)
Joint migration	10.28 (5.97)
Separated migration	11.00 (5.76)
Gender	
Female	11.50 (5.80)
Male	8.73 (4.75)
Age	
14- to16-year-olds	10.24 (5.57)
17- to 19-year-olds	9.94 (5.36)
Poverty status	
Yes	10.04 (5.59)
No	10.00 (4.74)

Table 2.5 shows youth's attachment to mother predicting total difficulties score. Results showed that gender accounted for 7% of the variance in total difficulties reported; males had significantly lower mental health scores than females. The full model (Model 2) was also significant, $F(1, 119) = 16.89$, $p < .001$. With attachment anxiety and avoidance included, 30% of the variance in mental health was accounted for. There is a significant, positive relationship of attachment avoidance to total difficulties score, $r^2 = .26$. A significant positive relationship was

also shown between attachment anxiety and total difficulties score, $r^2 = 0.31$. The R^2 change in the model with attachment variable is .219.

Table 2.5. *Summary of hierarchical regression analysis with attachment variables predicting total difficulties score (n = 122)*

	Model 1			Model 2		
Variable	*B*	*SE B*	*β*	*B*	*SE B*	*β*
Male	-3.01	0.93	-0.28**	-2.40	0.83	-0.23**
Attachment Avoidance				1.01	0.34	0.25**
Attachment Anxiety				1.54	0.44	0.30***
R^2		0.07			0.28	
F for change in R^2		10.44**			18.59***	

Reference group = female. $^{**}p < .01$. $^{***}p < .001$.

Table 2.6 shows parental characteristics predicted 31% of the variance in total difficulties scores. Model 2 shows that the full model was significant $F(1, 116) = 12.80$, $p < .001$. Parental involvement was significantly and negatively related to mental health, $r^2 = .37$. Autonomy-granting was significantly negatively related to mental health, $r^2 = .27$. There was no significant relationship between parental supervision and total difficulties score. The R^2 change in the model with parenting variables is .251. Comparison of these two models shows that after controlling for the effect of gender, parenting variables contribute more to the explanation of variance in total difficulties score than attachment.

Table 2.6. *Summary of hierarchical regression analysis with parenting variables predicting total difficulties scores (n = 120)*

	Model 1			Model 2		
Variable	*B*	*SE B*	*β*	*B*	*SE B*	*β*
Male	-2.53	0.96	-0.24**	-2.05	0.84	-0.19**

Involvement	-0.42	0.10	-0.39***
Autonomy Grant	-0.29	0.10	-0.24**
Supervision	-0.28	0.22	-0.11
R^2	0.05	0.28	
F for change in R^2	6.99**	13.98***	

Reference group = female. **$p < .01$. ***p < .001.

A third hierarchical linear regression was conducted with attachment and parenting entered at one time. The overall model was significant, $F(6, 114) = 10.69$, $p < .001$. This model accounted for 36% of the variance in total difficulties score. With all variables entered in the model only gender, $t(114) = -2.81$, $p < .01$, autonomy-granting, $t(114) = -2.25$, $p < .05$, and attachment anxiety, $t(114) = 3.13$, $p < .01$, significantly predicted total difficulties score (see Table 2.7).

Table 2.7. *Summary of hierarchical regression analysis with attachment and parenting variables predicting total difficulties score*

	Model 1			Model 2		
Variable	*B*	*SE B*	*β*	*B*	*SE B*	*β*
Male	-2.94	0.94	-0.26**	-2.29	0.82	-0.21**
Attachment				0.34	0.40	0.09
Avoidance						
Attachment anxiety				1.41	0.45	0.28**
Involvement				-0.19	0.11	-0.17
Autonomy Grant				-0.22	0.10	-0.18*
Supervision				-0.27	0.22	-0.11
R^2		0.76			0.36	
F for change in R^2		9.72**			10.13***	

Reference group = female. *$p < .05$. **$p < .01$. $p < .001$.

Separated migration

Regression analysis was used to investigate the hypothesis that separated migration produces attachment-related anxiety in the mother, which in turn mediates the effect on total

difficulties score. Because the independent variable is a multi-categorical variable, dummy coding was used with children separated in migration as the reference group. Gender and age are included in the model given their relationship to migration group. Table 2.8 shows the estimated coefficients for the relative total, direct, and indirect effects of the mediation model analyzed in PROCESS.

Table 2.8. *Estimated path coefficients from mediation analysis*

Outcome	***M***		***Y***			
		Coefficient (*SE*)		Coefficient (*SE*)		Coefficient (*SE*)
Constant	i_1	2.45 (.22) ***	i_3	13.60 (1.28) ***	i_2	7.37 (1.65) ***
Family migration	a_1	-0.55 (.24) *	c_1	-2.10 (1.34)	c'_1	-0.70 (1.23)
2nd Generation	a_2	-0.85 (.22) ***	c_2	-2.64 (1.26) *	c'_2	-0.49 (1.20)
Gender		-0.22 (.18)		-3.28 (1.03) **		-2.74 (.93) **
Age		-0.37 (.18) *		0.16 (1.04)		1.09 (.952)
Attachment anxiety					b	2.54 (4.80) ***

Reference groups = separation migration, female, 14- to 16-year-olds

Results of the total effects model showing migration group predicting total difficulties score (path c) is significant, $F(4, 114) = 3.26$, $p = .01$, $R^2 = .10$. There were significant differences in total difficulties score between children of separated migration and second-generation children, $t(114) = -2.10$, $p < .05$. There was no difference in the total difficulties scores between children of separated migration and family migration, $t(114) = -1.57$, $p = .12$. The path predicting the effect of migration group on attachment anxiety (path a) was significant, $F(4, 114) = 4.49$, $p < .01$. Migration group accounted for 14% of the variation in attachment anxiety. Children of family migration reported less attachment anxiety than children of separated migration, $p = .02$. Second generated children also reported less attachment anxiety than children of separated migration, $p <$

.001. Holding migration experience constant (path b), children with attachment anxiety had greater total difficulties score (b = 2.537).

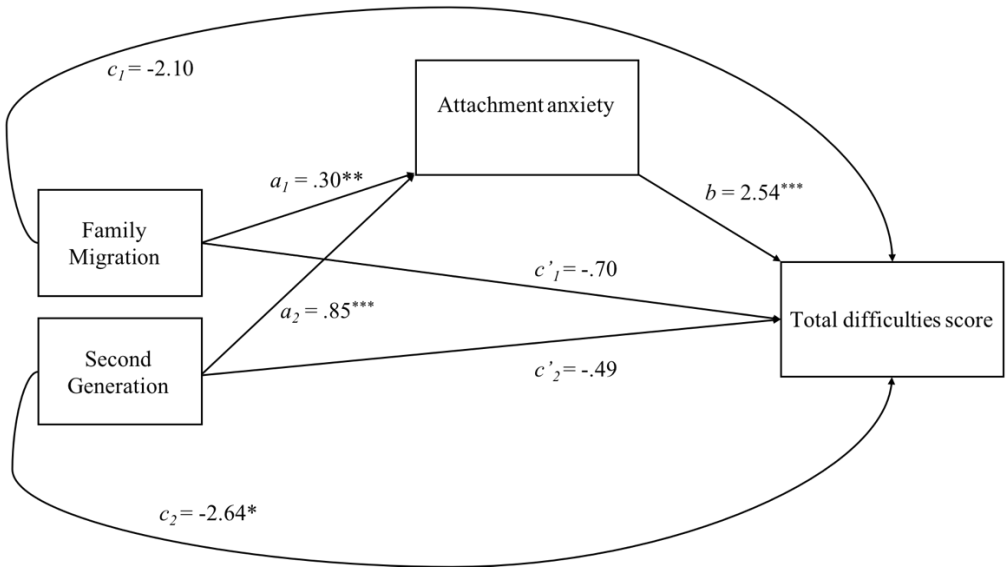

Figure 2.3 Graphical representation of mediation analysis

The path predicting total difficulties with the mediator included was significant $F(5, 113) = 8.79$, $p < .001$ and accounted for 28% in the variation in total difficulties scores. The relative indirect effect was tested using a bootstrap estimation approach with 5,000 samples. Adjusting for group differences in attachment anxiety, differences in total difficulties score between children of separated migration and second-generation children were no longer significant, consistent with full mediation, $t(113) = -0.40$, $p = .69$. Figure 2.3 illustrates the results for this mediation. It is important to note that there is no difference in attachment security, $b = .30$, $t(114) = 1.47$, $p > .05$ or total difficulties score, $b = .54$, $t(114) = .47$, $p > .05$ between children of family migration and second-generation children.

DISCUSSION

The mental health of immigrant children is a topic of great interest. It is well-known that racial discrimination, particularly for Black (Rumbaut, 1994) and Hispanic (Ríos-Salas & Larson,

2015) immigrant youth negatively impacts the psychological outcomes of their immigration experience. It has also been well-established that ethnic identity can act as a buffer against psychological symptomatology (Sanchez, Bentley-Edwards, Matthews, & Granillo, 2016; Tummala-Narra, 2015a). Apart from these social and individual factors, family dynamics remain an important variable that has not been explored at great length and not at all with Caribbean youth. This study explored the effects of parenting and attachment on the mental health of Caribbean immigrant children. Taking into account the different migratory patterns of Caribbean immigrant families, this study also compared two groups of first generation Caribbean adolescents, one group that migrated at the same time as their mothers (family migration) and another group that migrated separate from their mothers (separated migration), to a group of second generation Caribbean adolescents. Maternal separation due to migration was expected to contribute to differences in the mental health of first-generation adolescents. There were no predicted differences were expected between first-generation family migration and second generation.

Overall, fairly similar levels of mental health were reported across the three groups of immigrant children. Previous work has found a mixed pattern of results in regards to an immigrant advantage in mental health (Tummala-Narra, 2015b). The present study did, however, find generational differences when the attachment anxiety of separated children was taken into account. A mediation analysis was conducted to test the contribution of migration-based maternal separation in producing differences in mental health outcomes of immigrant children. Attachment anxiety has been previously shown to be higher among first-generation children who experienced maternal separation as result migration than among first-generation children who migrated with their mothers (Cassells, forthcoming). Attachment anxiety is positively related to a number of mental health problems (Mikulincer & Shaver, 2012). The results of this study bear out that

consequence. Attachment anxiety fully mediated the differences observed in total difficulties between second-generation adolescents and first-generation adolescents who experienced maternal separation. The results from the mediation shows that the differences in mental health between these two groups owes entirely to differences in attachment anxiety. These findings indicate that children separated from their mothers as a result of migration are an elevated risk for experiencing mental health problems due to attachment anxiety.

Many studies have reported on the emotional and behavioral problems facing left-behind children (Cassells, 2015; D'Emilo et al., 2007; Dilly, 2014; Graham & Jordan, 2011; Schapiro, Kools, Weiss, & Brindis, 2013; Su, Li, Lin, Xu, & Zhu, 2013; Suárez-Orozco, Todorova, & Louie, 2002). Psychological distress was found to be highest among immigrant children who endured problematic separations, which remained consistently high over time (Suárez-Orozco & Suárez-Orozco, 2001). This is first study to show attachment anxiety as a principal mechanism through which the mental health of immigrant children is affected. Furthermore, by measuring mental health after children are reunited with the mothers, support is found for the argument that maternal separation bears long-term consequences to mental health (Bowlby, 1988). This findings joins the limited work showing that separation in early life due to migration continues to have effects on attachment and adjustment throughout life (Arnold, 2006, 2011).

However, caution must be taken when interpreting the results from the mediation analysis as both the mediator and outcomes variables were measured concurrently. A longitudinal study that tracks the attachment anxiety and mental health of children who were separated in migration would increase the rigor of the evaluation of attachment as an underlying mechanism that accounts for some of the ill effects of migration-related separation from mothers Additionally, young women in this sample had greater total difficulties than young men, a consistent finding within the

literature (Landstedt, Asplund, & Gillander Gådin, 2009). The gender imbalance across groups did not allow for tests of interaction effects. Future work may also want to examine whether young girls separated in migration are at an elevated mental health risk compared to young boys of the same and whether the mediating role of attachment varies in the migration experience-mental health relationship as a function of gender.

Another aim of the present study was to explore two family-related factors, parenting and attachment, on mental health. The study hypothesized that both attachment and parenting would predict mental health; these hypotheses were supported. Attachment avoidance and anxiety both predicted mental health in adolescents, which is in line with previous research (Allen, Porter, McFarland, McElhaney, & Marsh, 2007). This is the first study to extend these findings to a sample of Caribbean immigrant adolescents. In the full model, attachment anxiety was most important, likely owing to the high levels of attachment anxiety among separated children. Moreover, two of the three parenting characteristics predicted mental health. The findings that parental involvement and autonomy-granting negatively predicted total difficulties scores is in line with previous work showing that positive parenting is associated with positive adjustment outcomes of Caribbean children (Griffith & Grolnick, 2014). Autonomy-granting was the only parenting characteristic that remained significant in the full model, offering autonomy support as a valuable parenting strategy for Caribbean parents.

To the question of which is most significant the answer appears to be parenting characteristics likely owing to the parenting differences observed across our three migration groups. Children of the separated migration group had less involved mothers. More still, even though authoritative parenting was low in the whole sample, none of the children reported their mothers as authoritative. Previous work on Caribbean parenting suggests that authoritative and

neglectful parenting are most common (Lipps et al., 2012) and that parenting behaviors of Caribbean parents can be categorized as authoritarian (Muruthi, Bermúdez, Bush, McCoy, & Stinson, 2016). Future work may want to answer what is it about maternal separation due to immigration that would lead to less parental involvement. Some have argued that these parents struggle to regain their authority after separation, so one possibility is that this kind of migration changes family roles in such a way that parents adopt a more relaxed parenting style (Smith et al., 2004). Another possibility is that there are selection effects to be account for, both among mothers who leave their children behind and within the children who are left. For example, are mothers who leave their children behind less parentally prepared? Or, are there child attributes, such as age or temperament, that might lead to the adoption of a lax parenting style and perhaps inform, in some way, the mother's decision to migrate. One way to test this hypothesis is to explore whether migrant mothers with multiple children leave some children behind and not others. This author would like to state that while these important factors to consider, many migrant families are facing constraint choices (Dreby, 2015) which may counteract any potential selection bias.

This study adds to the literature by providing information on the mental health of Caribbean immigrant adolescents. The study is the first to empirically show that attachment anxiety leads to deficits in the adjustment of children separated in migration. Pottinger and Brown (2006) recommend several strategies for improving the psychological adjustment of Caribbean left-behind children. Among them are workshops designed to help these children name their feelings and find appropriate ways to express the loss and grief they experienced. This study extends the work on left-behind children by showing the long-terms effects of serial migration. One exciting area of future work lies in further disentangling the relationship between attachment security and mental health of separated children. The use of attachment-based therapies for children and

families of serial migration is an area in which clinicians and practitioners may be able to respond to the needs of these migrants.

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CHAPTER 4

ACADEMIC POTENTIAL: THE IMPACT OF MIGRATION AND MIGRATION-RELATED MATERNAL SEPARATION ON THE EXECUTIVE FUNCTION ABILITIES OF CARIBBEAN-ORIGIN YOUTH

INTRODUCTION

Recent estimates show that school-age children are more diverse today than in previous years (Kent, 2015). One factor contributing to diversity within the American student population is recent changes in immigration. Since the landmark Hart-Cellar Act of 1965 there has been a steady increase in immigrants to the United States, so much so that the percentage of foreign-born persons are near record levels not seen since the "mass migration" of the early 1900s (Pew Research Center, 2015). In addition to an increase in migration, the post-1965 period brought forth a shift in where migrants arrive from. Unlike at the turn of the 20th century when European migrants represented the majority of inflows, today Latin America, the Caribbean, and Asia are among popular sending regions (Census Bureau, 2013). By 2050, 19% of the total U.S. population is projected to be foreign born and 34% of children ages 17 and younger will be first- or second-generation immigrants (Passel & Cohn, 2008). As the student population becomes more culturally and linguistically diverse it begs the question of how prepared schools are to educate immigrant children.

Schools play an essential role in the assimilation of immigrant children and their families (Portes & Rumbaut, 2001; Suárez-Orozco & Suárez-Orozco, 2001; Suárez-Orozco, 2008). Moreover, educational success is a key feature of later socioeconomic success (Kao, 2013). Researchers interested in the adaptation of immigrant children have concentrated on their academic achievement because of the intertwined nature of education and social and economic

mobility (Tienda & Haskins, 2011; Venez, Abrahamse, Quigley, 1995; Buchmann & Parrado 2005). For immigrant children, there are various individual and environmental characteristics affecting their academic trajectories (Suárez-Orozco, Bang, & Onaga, 2010) with many of the barriers to education unequally affecting them (Duong, Badaly, Liu, Schwartz, & McCarty, 2016). These include low parental education (Portes & Rumbaut, 2001) and attending underresourced schools (Han, 2008; Marks & Pieloch, 2015) in poor neighborhoods (Potochnick & Mooney, 2015), all of which are associated with the high rates of poverty within this population (Chaudry & Fotruny, 2010). Economic disadvantage is also related to school preparedness and achievement (Duncan & Murnane, 2011). Low family economic resources among immigrant children when compared to U.S.-born peers is associated with a greater likelihood of lacking the materials necessary for classroom participation (Marks, Seaboyer, & Coll, 2015).

Generation status

A common way to differentiate immigrant children is by generation status. Generational status serves as a good proxy for school ability because it tends to capture other critical factors like poverty and English proficiency (Portes & Rumbaut, 2001). There is evidence to support generational differences in educational outcomes, namely that later generations demonstrate a decline in academic achievement (Glick & White, 2003; Hernandez, Denton, Macartney, & Blanchard, 2012; Kao & Tienda, 1995; Portes & Rumbaut, 2001; Tamis-LeMonda, Baumwell, Dias, 2011). The poorer academic outcomes that are associated with more acculturation has been termed the *immigrant advantage in education* (Coll & Marks, 2012). This phenomenon was first documented by Kao & Tienda (1995) who assessed the educational performance, achievement, and aspiration of three generations of immigrant children from diverse backgrounds using the National Educational Longitudinal Study of 1988. They found that first- and second-generation

children, on the whole, out-performed their native-born peers on all measures. They concluded that children of immigrants (the second generation) are at an educational advantage because they can capitalize on their English proficiency while also benefitting from their immigrant parent's optimism.

The immigrant optimism hypothesis suggests that migrants, already a self-selected group, possess characteristics that protect their aspirations from the setbacks they encounter while adjusting to life in the United States (Kao & Tienda, 1995). The optimism of immigrant parents is translated into high expectations of educational success for their children. Native-born parents, especially those from minority groups, tend to hold more moderate expectations of educational success because of their awareness of the structural barriers that work to limit social and economic mobility in the United States. Turning toward the selection effects of migration and its influence on immigrant children academic outcomes, Palacios, Guttmannova, and Chase-Lansdale (2008) argue two possibilities are likely. First, it is possible that, consistent with the "brain drain" hypothesis, individuals who migrate originate from higher socioeconomic backgrounds with higher levels of education than those who stay behind. These resources along with high levels of motivation and ambition are transmitted to their immigrant children. On the other hand, it could also be true that instead of a positive selection, negative selection is at play. If migration is understood as a means to acquire greater human capital, then reasonably migrants arrive to the United States with significantly less human capital positioning immigrant children behind their native peers. Indeed, Perreira, Harris, and Lee (2006) find some support for the second argument. Lower levels of human capital within Asian and Hispanic families' places immigrant youth at an increased risk of dropping out of high school.

Taken together, a complicated story unfolds with respect to the academic outcomes of

immigrant children. On the one hand, immigrant children appear at risk for lower educational achievement, while on the other hand they appear to possess attributes like strong work ethic and high educational expectations that buffer against social constraints and supports academic success (Suarez-Orozco, Suarez-Orozco, 2001, Portes & Rambaut, 2001).

Segmented assimilation

The question of what accounts for divergent patterns in the academic outcomes of immigrant children may be answered in part by *segmented assimilation* theory. Segmented assimilation extends conventional "straight-line" assimilation theory (Park & Burgess, 1921) by doing away with the assumption that immigrants will follow the same sequence of assimilation, where they become more similar to the majority group of the host society over time, and instead posits that pathways to assimilation are sculpted by the social structures of the host society, which often marginalizes nonwhites. The customs and norms of the society are adopted to varying degrees and with varying success depending on the racial and ethnic identity of the immigrant (Portes & Zhou, 1993). From this perspective one can see that the educational outcomes for immigrant children are likely to be nonlinear as they are influenced by where families settle, language ability, as well as by racism and discrimination (Portes & Rumbaut, 2001). The ways in which immigrants are incorporated into the host country is related to academic achievement of immigrant children (Buchmann & Parrado, 2006). For recent immigrant children, race and ethnicity play a significant role in their academic outcomes given the structural barriers that make it difficult for minority students to succeed in the United States.

A major strength of the theory of segmented assimilation is perhaps its usefulness in highlighting the unique resources and vulnerabilities of immigrant children from different racial and ethnic groups. Much of the research in academic achievement centers on the two largest

groups of immigrant children, Asian and Latin American (Harris, Jamison, & Trujillo, 2008). From this research we find that socioeconomic advantage explains much of the educational advantages among Asian immigrant children while the inverse is true for Latin American immigrant children. What is also learned from this research is the necessity of disaggregating between racial and ethnic groups who carry their own immigration histories. This latter point deserves greater emphasis in the literature as some immigrant groups (e.g. black immigrants) remain grossly understudied (Rong & Fitchett, 2008). In particular, Caribbean immigrant children are scarcely studied (Obinna, 2016; Rong & Brown, 2001) and are often grouped with Latin Americans (Feliciano, 2009; Han, 2008). The lumping together of Caribbean and Latin immigrants is probably due in part to the diversity within the region as well as the multi-racial identification among Caribbean individuals (Waters, Kasinitz, & Asad, 2014). Even though Black Caribbean immigrant teens have high levels of school engagement (Portes & Raumbaut, 2001) and high educational aspirations (Nicolas, DeSilva, & Rabenstein, 2009), and despite the fact that their parents hold high education expectations, these children appear at risk for downward assimilation and underachievement due to disadvantages in family structure and rates of incarceration (Portes & Fernández-Kelly, 2008).

Mixed methods, mixed results

Duong et al. (2016) recently addressed the conflicting findings among immigrant generations and suggests that some of the disagreement may be attributed to variation in assessment methods with key differences between studies that use self-report data compared to those using school records. Findings from their meta-analysis indicate that there may be evidence of a unique advantage among the second-generation, however their advantage varies by academic indicator. For example, they found no differences in grade point averages between first and

second-generation immigrants, but a significant difference in standardized test scores; second-generation children outperformed first-generation on standardized tests. Conversely, there were no differences between test-scores of second and third generations, but the second generation had better grade point averages. The authors also found that self-reported grade point averages may overstate the immigrant advantage, but nevertheless conclude that educational attitudes may drive the immigrant advantage in terms of grades. Their work supports the argument that traditional achievement measures seem to tap into differential components of student performance that may be unreliable in predicting the outcomes of immigrant children. Rather than focusing on traditional measures of achievement (i.e. test scores or grade point averages) which emphasize content knowledge but are influenced by factors outside of students' actual ability (Allen, 2005; Haladyna, Nolen, & Haas, 1991; Pekrun & Stephens, 2015), a shift toward predictors of achievement (e.g. school readiness) allows for underlying factors implicated in the development of knowledge acquisition to take center stage. A case can be made that it is just as useful to examine the factors underlying academic achievement as it is to examine academic achievement itself.

An example of this approach can be found in the research examining the ways in which language ability contributes to academic achievement. English language ability significantly predicts academic achievement. Immigrant children not proficient in English have lower academic achievement than their English-proficient peers (Kao, 2013). Meanwhile, some have argued that bilingualism has both advantages and disadvantages for immigrant children, especially for those in racial and ethnic minority groups (Golash-Boza, 2006). To understand the impact of dual-language ability, some have explored language biases in the administration of standardized tests and have found that foreign-born children who are randomly assigned to taking standardized tests

in English show a decrease in performance (Akresh & Akresh, 2011). However, an alternative approach is one that looks at the cognitive benefits dual-language ability offers and how it may be used to bolster performance in the classroom. In fact, recent studies on bilingualism challenge notions about the cognitive ability of immigrant children.

Bilingualism offers improvements in ways that are directly related to academic aptitude (Carlson & Meltzoff, 2008; Engel de Abreu, Cruz-Santos, Tourinho, Martin, & Bialystok, 2012; Krizman, Marian, Shook, Skoe, & Kraus, 2012). Furthermore, Carlson and Meltzoff (2008) report that Spanish-English bilingual kindergartens had equivalent scores to their monolingual peers on executive function. After controlling for verbal ability and socio-economic status, bilingual children had greater executive function scores, particularly in attention, which suggests that bilinguals could achieve at similar levels to their peers were they not disadvantaged in these areas. A recent study illustrates the neural basis for the bilingual advantage in cognitive functioning (Krizman et al. 2012). Again, bilinguals were shown to have better attentional control compared to monolinguals. The findings from this literature demonstrate that the academic potential of immigrant children may be concealed when predictors of cognitive ability are not taken into account.

English language ability is but one of many skills required for school success in the United States. Developmental psychologists have highlighted school readiness as an important predictor for learning and achievement (Blair, 2002; Raver, 2003). The school environment requires students bring their academic skills as well as their socio-emotional ability. Those children who are able to regulate their emotions, who can positively navigate peer and teacher relationships, and who can attend to the class material even in the presence of disruption fare better in the long term than those who are not as successful at doing these things. This framework has been applied in a

recent study with Black, primarily Caribbean immigrant children, an often overlooked group in the literature (Calzada et al., 2015). Calzada and colleagues found that both immigrant and non-immigrant children showed a decline in math and reading achievement over time, but that the decline was much steeper for non-immigrant children even though achievement was negatively predicted by externalizing problems and classroom quality in early life for both groups. The authors suggest that immigrant children may be imbued with protective factors in the home and family environment that are not present in the lives of non-immigrant children. Previous research has shown a link between executive function and school readiness (Blair, 2002). And so, an alternative explanation may be that some immigrant children are harnessed with better neuro-cognitive skills, like executive function, and that this is what supports their achievement.

A second approach to examining in further depth what is behind grades or test scores among immigrant children is one that takes into account the family factors that are associated with the educations success of immigrant children. For instance, family structure affects the academic outcomes of immigrant children. Research has consistently found that children from in-tact families have higher academic outcomes than those of other family compositions (Buchmann & Parrado, 2006; Liu & White, 2017; Pasquali et al., 2012; Portes & Rumbaut, 2001; Suárez-Orozco, 2008). What consequence does this have for immigrant families that practice serial migration? Serial migration is a type of migration in which family member migrate one at a time, and in many cases a parent's migration precedes their child who remain in the country of origin (Smith, Lalonde, & Johnson, 2004). Furthermore, parental engagement improves math test scores and reduces the likelihood of dropping out of high school above and beyond the adverse effects of family structure (Lui & White, 2017). It is sobering, however, to consider the potential challenges for a first-generation parent to negotiate a typical American public school in order to fully engage

with their child's life in a new society. This is perhaps ironic to consider given that one of the most essential reasons families immigrate to the United States is in order to provide their children with better educational opportunities.

The current paper argues that studying executive function among immigrant children is valuable because it may help bring harmony to the disjointed findings while simultaneously identifying an area of potential intervention. If it is found that some immigrant children have better executive function than others, then it might provide at least a partial explanation for the discrepant findings on immigrant relative academic success to nonimmigrant children plus extend the socio-cultural and economic arguments that dominate the discussion. Building on this perspective, the paper goes a step further by offering and additional factor that may contribute to the inconsistent findings in academic achievement; namely that the heterogeneity in academic outcomes may also relate to the heterogeneity within the immigrant population. This heterogeneity is not defined in terms of racial or ethnic group differences, but instead by the unique differences in the migration experience. Many immigrant children experience maternal separation due to migration, particularly those from the Caribbean. How these children vary from their counterparts who did not experience maternal separation is worth exploring, especially given the differences in academic outcomes exist both between and within groups of immigrant children. The present study explores whether differences in executive function are observed *between* immigrant generations as well as *within* the first-generation by differentiating among those foreign-born children who experienced maternal separation due to migration and those who did not.

LITERATURE REVIEW

Migration experience

Even though generation status is one way to differentiate between immigrant children, it

does not capture the rich complexity and nuances that can make the process of immigration quite diverse. Perreira and Ornelas (2011) provide a useful framework for thinking about the combined impact of the stages of migration on immigrant children. For example, second-generation children contend only with the post-migration factors that influence educational success, many of which have already been discussed above. First-generation children must also cope with additional factors, many of which are wrapped up in acculturation stress (Berry, 2006), but also their experience with migration.

Some have argued for more consideration of the education received by foreign-born children prior to migration. Immigrant children may have been educated in schools that are above or below American standards (Bozick, Malchiodi, & Miller, 2016). If students are coming from countries that are not up to the American standard, then they may underperform. Those coming from countries with more advanced educational systems than the U.S. may demonstrate better academic performance. For example, the effect of early education in another country on later academic is so strong that even those children who spent little time in their country of origin still show the outcomes. Another study found that parental motivations for migration play a role in the academic trajectories of children (Hagelskamp, Suárez-Orozco, & Hughes, 2010). Although employments motivations were more salient than educational motivations, children whose parents prioritized the latter had higher grade point averages. The sharp decline in grade point average over the children's first five years in the American school system was related to parental emphasis on employment.

Looking only at post-migration SES is insufficient because much of what separated families economically prior to migration evens out once they arrive in the United States (Pong & Landale, 2012). On the other hand, pre-migration parental education was related to cognitive

stimulation in the home environment and was found to be the most important parental attribute affecting children's academic achievement among Latin American (Pong & Landale, 2012). Therefore, there is reason to believe that mixed findings between immigrant children and non-immigrant children may also exist among immigrant children. As one scholar put it, some immigrant children do not graduate high school while others go on to attend Ivy League institutions (Suarez-Orozco, 2008). One reason for the inconsistent findings in academic achievement on immigrant children may be due to a failure to take into account differences among foreign-born children. Consideration must be given to the ways in which the migration experience principally affects the development of immigrant children, especially given the variation in the reasons for migration and how families arrive (Adelman & Taylor, 2015; Adserà & Tienda, 2012).

Despite the work that has been done to show how changes in the reception of new immigrants in the United States relate to the academic success of immigrant children (Potochnick & Mooney, 2015), what remains largely absent from discussion is the changes in migration patterns and the different family organizations engendered that these changes. The 21st century has seen an increase in female participation in immigration (Donato, 1993). The global capitalist economic system offers women unprecedented employment opportunities, which subsequently contributes to their own migration (Donato, 1993; Falicov, 2007; Federici, 1999; Gündüz, 2013; Samonte, 2003). The result is that sometimes they must leave their children behind (D'Emilo et al., 2007). Among the children who arrived to the U.S. after 1990, 21 percent were separated from their mothers for at least one year (Enchautegui & Menjívar, 2015). This figure captures children who were no older than 20 years old between 2009 and 2011. The severity of the problem is underscored by the fact that these children will have spent an average of 27 percent of their lives away from their parents (Enchautegui & Menjívar, 2015).

Maternal separation and academic outcomes

Remittances from family members abroad are upheld as the standard for achieving economic and educational gains for families in low-income countries (Acosta, Fajnzylber, & Lopez, 2007). However, support for this argument is mixed (Amuedo-Dorantes, Georges, & Pozo, 2010). Binci (2012) found that remittances from domestic migration had a greater significant positive impact on children compared to remittances form international migration. She concludes that internal migration is better for children because caregivers can maintain closer supervision of their children. Indeed, when mothers are away, children are more likely to be truant (Gamburd, 2008). Research has shown that for every month a child is left behind (parent is away), the probability of dropping out increases by 50% and the probability of educational delay increases by 60% (Giannelli & Mangiavacchi, 2010).

Others have argued that the "culture of migration" also works against the remittance argument (Kandel & Massey, 2002; Wright & Levitt, 2014). Having a parent abroad may contribute to lower academic aspirations because children may no longer feel the need to try hard in their local schools (Kandel & Massey 2002), even though remittances do not seem to have an effect on parent's aspirations for children's educational outcomes (Sawyer, 2016). Given longstanding evidence showing the effect of psychosocial variables on the academic success of immigrant youth (Portes & Rumbaut, 2001), the emotional distress from the factors surrounding the separation could make it difficult for them to adjust to the school environment after reunification.

One important study highlighted the need to explore parental separation in migration as an influential variable in the academic outcomes of immigrant children (Suarez-Orozco, 2008;

Suarez-Orozco, Bang & Ogna, 2010). Suarez-Orozco (2008) found that regardless of high levels of school engagement GPA declines over time, consistent with the immigrant paradox in education. The Longitudinal Immigrant Student Adaptation Study (LISA), collected data on over 300 young people with origins in Central America, China, Haiti, Dominican Republic, and Mexico. The authors of this study focused on experiential differences between youth who were consistently high achieving and those whose academic performance waned over time. Immigrant children who reported that separation from parents was a problem saw a decline in academic performance. On the other hand, high achievers were more likely to be from intact families or have shorter lengths of separation. It is important to note that it was not just the separation itself, but also the transition to reunification appeared to contribute to achievement. Those children with complicated reunions saw decreases in their academic performance as well.

There are some studies that have looked at academic outcomes with specific regard to maternal separation (Cassells, 2015; Gindling & Poggio, 2012). Building on the work conducted by Suarez-Orozco and her colleagues, Gingling and Poggio (2012) established an empirical link between parental separation during migration and the academic outcomes of immigrant children after reunification. In their sample, 12% of the children separated from their parents during migration displayed an educational gap—they were older than they should be for the grade they were in—compared to 2nd generation children and children who migrated with their parents. Age at separation was found to be more influential to educational gap than length of separation. Children who migrated were separated later in life (and therefore migrated at an older age) had the greatest educational gap compared to those separated earlier in life (and therefore migrated at a younger age). A similar trend was found when examining dropout rates; dropout rates are highest among those children separated in migration. In fact, parental separation accounted for almost all

the variation in dropout rates among Latin American children.

In light of the evidence reviewed, a reasonable conclusion is that the heterogeneity in academic outcomes owes to heterogeneity in the experiences of the foreign-born; namely that some children are separated from their mothers in migration and others are not. Put another way, one factor that could contribute to variation in academic outcomes among the foreign-born is maternal separation as this contributes to both diversity within the foreign-born as well as diversity in the academic outcomes of immigrant children.

The Caribbean: A Key Region

The research provided hitherto largely focuses on Latino immigrants, particularly those from countries like Mexico where parental absence in migration often means migrant fathers (Dreby, 2010; Carola Suárez-Orozco et al., 2010). On the other hand, maternal separation is much more common in Caribbean countries like Jamaica (Crawford-Brown, 1999), the Dominican Republic, and Haiti (Suarez-Orozco, Bang, Onaga, 2010). The high rates of poverty and high presence of female headed households in the Caribbean lead to serial migration, mothers are often the ones to migrate leaving their children behind (Crawford-Brown & Rattray, 2001). Caribbean children are left early in life, sometimes shortly after birth (Crawford-Brown & Rattray, 2001; Cassells, 2016) and separations can last for long periods, sometimes up to ten years (Crawford-Brown & Rattray, 2001; Cassells, 2015). Some work has shown that Caribbean left-behind children perform poorer on achievements test than Caribbean children who migrated at the same time as their mothers (Cassells, 2015).

The previous section illustrates the terms in which academic outcomes are often discussed. As previously mentioned, variation in the metrics used contributes to some of the paradoxical findings regarding the academic achievement of immigrant children (Duong et al., 2016). One

factor that receives scant attention from research with immigrant children is executive function, despite its relevance to many aspects of education (Baggetta & Alexander, 2016; Blair, 2002;Nesbitt, Baker-Ward, & Willoughby, 2013; Visu-Petra, Cheie, Benga, & Miclea, 2011). This paper argues that executive function which is a critical component of academic success is an important process to study in the context of academic achievement and migration. One of the reason for this is that executive functioning is sensitive to chronic stress and appears to not become fully developed until late adolescences or early adulthood.

Executive Function

The story of Phineas Gage provides a background to our understanding of executive function. Damage to the frontal lobe did not change Phineas' higher-level mental abilities but did lead to deficits in his personality and behavior (Linden, 2008). Often cited as the first legion study, research on Phineas Gage continues to inform our understanding of the separate systems at work in our brain that allow us to function as individuals. Conceptualizations about the nature and organization of execution function include models emphasizing executive function as a control center that manages other cognitive processes such as planning or self-control (Hanson & Hackman, 2012). Others stress that executive function is comprised of dissociable elements which are related to each other in that they represent a shift away from automatic processing toward more conscious, controlled processing, but are not necessarily integrated (Diamond, 2013). Each element is considered, by itself, to be a marker for executive function such that the construct can be referred to in plural terms when discussing more than one element (i.e. executive functions). A middle ground perspective is offered by Miyake et al. (2000) who found that while the executive function elements are distinguishable from each other, and relate differently to performance, the moderate correlation between them would suggests some unifying mechanism.

The question of whether executive function is unitary, multidimensional, or both remains unresolved in the literature. There is however clear agreement on the core components of executive function. These include inhibitory control, working memory, and attentional control (Baggetta & Alexander, 2016). Inhibitory control can be understood as the ability to control our impulses in lieu of a more appropriate response (Diamond, 2013). Working memory is the ability to hold immediate information in mind and "working" with it in some way (e.g. mental math) (Andersson, 2008; Baddeley & Hitch, 1994). Attentional control or cognitive flexibility, is the ability to shift attention from one task to another or shift between mental states (Monsell, 2003).

Executive function skills are often referred to as "hot" or "cool" (Carlson, Zelazo, & Faja, 2013). Cool executive functions coordinate logic-based problem solving and are associated with the prefrontal cortex (PFC) whereas hot executive functions coordinate emotion-based problem solving and are associated with the orbitofrontal cortex (Zelazo & Carlson, 2012). Another way to express the hot-cold distinct is to consider whether the problem-solving occurs in an affective, motivational-relevant context ("hot") or in a neutral state ("cool"). Even though executive function generally develops most rapidly in preschool years (Carlson, Zelazo & Faja, 2013), hot executive functions appear to developmentally lag behind cold executive functions (Poon, 2018). That they develop independently also suggests that deficits in one area does not necessitate deficits in another. Zelazo and Carlson (2012) argues that the context in which the executive function is measured (hot vs. cold) may illuminate or obscure problems. For example, impairments to the orbitofrontal cortex may not reveal deficits in executive function if executive function is measured using neutral measures (Zelazo & Carlson, 2012). Nevertheless, inhibitory control, working memory, and cognitive flexibility describe cool executive functions that are essential for learning and are considered building blocks for more advanced executive functions like planning (Poon,

2018).

The research connecting executive function to education is numerous (Best, Miller, & Naglieri, 2011; Clancy Blair, 2002; Brock, Rimm-Kaufman, Nathanson, & Grimm, 2009; Duncan et al., 2007; Raver & Blair, 2014; Visu-Petra et al., 2011), yet little work has been done with immigrant children (Chen et al., 2015). Findings from the general body of research provide two strong reasons to explore executive function in a sample of immigrant children; they are stress and parenting (Blair, 2016). The research on poverty and child development best illustrates the relationships between stress, parenting, and executive function development. The literature has consistently shown that cognitive development is compromised in poor environments (Lengua, 2012). Raver, Blair, Willoughby, and Investigators (2013) found that infants from households with chronic financial strain had lower executive function abilities at age four. Furthermore, salivary cortisol was elevated in infants living in lower income households and mediated the relationship between poverty and executive function. Cortisol also mediated the relationship between parenting and executive function, specifically with positive parenting being associated with lower cortisol levels (Blair et al., 2011). Crook and Evans (2014) utilizing the Early Childcare national data set showed that independently of IQ, early childhood poverty was adversely linked to reading and math deficits in 5th grade that was largely mediated by deficiencies in planning assessed in third grade.

The context of poverty is stressful (Evans & English, 2002), and includes physical as well as psychosocial disadvantages for child development (Evans, 2004). Low-income families are often marked by harsh parenting styles, chaos, family conflict, and neighborhood violence. These factors not only negatively affect cognitive development, but they also go on to negatively impact academic achievement, (Evans, Brooks-Gunn, & Klebanov, 2011). Most immigrant children live

in poverty (Child Trends, 2014) and so one may expect that the above findings are likely to replicate in the sample of immigrant children. However, that conclusion depends on the extent to which we can assume poverty expresses itself similarly across contexts. Regardless, there are strong theoretically reasons for exploring stress and parenting in the context of immigration.

Stress

There are three hypothesized ways in which stress relates to executive function abilities (Shields, Sazma, & Yonelinas, 2016). One line of reasoning argues that stress deploys cognitive resources away from the development of executive function diverting attention towards the stressor. A second argument is that stress causes the brain to use more bottom-up processing that is more reactive and automatic rather than utilizing top-down, controlled processing that is more reflective and conscious. In this way complexed, higher-order executive function abilities are underutilized. The third argument is that cortisol disrupts normal prefrontal cortical functioning. Overall, stress has been shown to consistently and negatively impact cognitive flexibility and working memory whereas the findings on inhibitory control appear mixed and inconsistent (Shields et al., 2016). These findings are based on acute stressors, but the questions of how a stressful life event might affect executive function development remains open.

Children whose migration coincides with the time of rapid development of executive function (i.e. preschool age) may be placed in a vulnerable position. Migration by itself is a significant life event that is also associated with acculturative stress. Together the experience of migration may negatively impact cognitive development for immigrant children. Acculturative stress is a type of stressor that occurs as a result of engaging with the acculturation process. Acculturation follows from the physical, cultural, social, and psychological changes experienced in a new society (Berry, Kim, Minde, & Mok, 1987). These changes have consequences for the

wellbeing of the individual, often resulting in anxiety and depression. One study found that acculturative stress full mediates the relationship between migration-related trauma and internalizing symptoms in a diverse sample of migrant youth (Thibeault, Mendez, Nelson-Gray, & Stein, 2017).

Blair (2002) emphasized that children's emotionality impacts their cognitive functioning and better effortful control is associated with better coping abilities (Lengua, 2012). If one considers these effects, then one would expect immigrant children to have executive function difficulties and potentially lower academic achievement. Children must successfully navigate the classroom, and to do this requires the development of both cognitive and socioemotional skills (Raver & Blair, 2014). The classic example is that anxiety might prevent a child from participating in the class. Immigrant children who are concurrently learning the rules of a new culture and classroom may divert their cognitive energies to these efforts rather than focusing on the course material (Rogers-Sirin, Ryce, & Sirin, 2014). Albeg and Castro-Olivo (2014) found that Latino middle school age children who reported high levels of acculturative stress were reported by teachers as having lower levels of academic performance, and acculturative stress predicted academic performance. Furthermore, this occurred independently of internalizing symptoms. Some work has even shown that disruptions in family functioning as a result of parental acculturative stress indirectly impacts the academic performance of Chinese immigrant children (Hou, Kim, & Wang, 2016). Another study with Mexican migrant parents who practiced serial migration reported significantly higher acculturative stress than parents who were not separated from their children due to migration (Rusch & Reyes, 2012). Difficult reunifications between parents and children were associated with lower levels of family cohesion, higher levels of acculturative stress, depression, and unhealthy family functioning. This study did not explore child

outcomes, but one wonder whether foreign-born children who experienced separation from a parent due to migration might have elevated risk for executive functioning difficulties and lower academic achievement.

To date there is only one study that had examined executive function in a sample of left-behind immigrant children (Hewage, Bohlin, Wijewardena, & Lindmark, 2011). The findings show that left-behind children performed worse on inhibition and working memory tasks compared to immigrant children with present mothers. The original study conducted in Sri-Lanka compared children from migrant households to children from non-migrant households, none of the children were migrants themselves. The current study seeks to build upon this work by comparing the executive function of first- and second-generation children in order to assess the impact of migration on executive function abilities. Moreover, Hewage et al. (2011) provide reason to believe that executive function is impacted by maternal separation, but the study was limited to children who were experiencing maternal separation. The present study explores whether the effects of maternal separation persist even after reunification when children have joined their migrant mothers abroad.

On the basis of the research reviewed, this paper hypothesizes that there will be differences in executive function abilities based on migration experience. The first hypothesis posits that second-generation children may have better executive function than first-generation children because they did not have to contend with the stressors of migration. The second hypothesis is relevant to the expressed differences among the first generation. Given that executive function is impacted also impacted by emotional stress, it stands to reason that the group of children who experienced separation due to migration may have poorer executive function than those who experienced migration without separation from a primary caregiver because the former must

contend with two forms of migration-related stress.

Caregiving environment

An alternative explanation is that the caregiving context may support or erode executive function development among immigrant children above and beyond acculturative stress or the emotional stress. The prefrontal cortex (PFC) and the anterior cingulate cortex (ACC) are brain regions implicated in the functionality of executive function (Hanson & Hackman, 2012). The PFC has a prolonged growth course and as a result executive function undergoes age-related maturation. Executive function's prolonged time course renders it susceptible to environmental input, particularly from the caregiving environment (Blair, Raver, Berry, & Investigators, 2014; Carlson, 2003; Fay-Stammbach, Hawes, & Meredith, 2014). Bernier, Carlson, and Whipple (2010) conducted a prospective study investigating how caregiving quality in the first and second years of life predicted executive function at age three. They found that children with sensitive mothers and mothers who encouraged autonomy performed better on tasks that required inhibition, shifting, and working memory. Also, three-year-old children who received quality parenting and displayed secure attachment, performed better on EF tasks even after controlling for previous executive function scores, SES, and language (Bernier, Carlson, Deschênes, & Matte-Gagné, 2012).

In their recent study, Bernier, Beauchamp, Carlson, & Lalonde (2015) found that attachment security in early life predicted better executive function abilities during kindergarten. Secure patterns of attachment are related to a reduction in negative arousal and the promotion of autonomy. Moreover, the psychobiology of secure attachment supports stress responses that are compatible with executive function development (Bernier et al., 2012). That is to say, securely attached children have parasympathetic responses and cortisol reactivity that are appropriately

developed and support the neural pathways related to executive function. Immigrant children who experienced separation in migration have been found to have higher attachment-anxiety (Cassells, forthcoming) and greater mental health issues as a result (Cassells, forthcoming). It is reasonable to expect that these will have the poorest executive function abilities.

METHOD

Participants and Design

This cross-sectional study was designed to explore the influence of parent-child relations on the mental health of three different groups of immigrant children. A hundred and twenty-five Caribbean (125) immigrant teenagers, ages 14 to 19, were recruited primarily from two afterschool programs in the Bronx and in Westchester County, New York State. One participant is excluded from analysis due to incomplete portions of the demographic survey. Fifty-three were second-generation immigrant children, 39 migrated with their mothers (family migration) and 32 migrated apart from their mothers (separated migration). The average age of the participants in the sample was 16 years old (M = 16.19; SD = 1.26), though second-generation children were younger (M =15.75, SD = 1.30) than children of family (M = 16.41, SD = 1.04) and separated (M = 16.66, SD = 1.23) migration. There was an even divide between males and females (n = 62) in the overall sample, however, some gender imbalances exist within in the foreign-born groups. There were more girls in the family migration group and more boys in separated migration group (see Table 3.1). Age and gender are included as covariates in analyses.

Recruitment. Participants were recruited on the basis of their migration experience, with children fitting into one of three migration groups. (1) *Second generation*: U.S. born children of immigrant (2) *Family migration*: foreign-born children who migrated to the U.S. at the same time as their mothers (3) *Separated migration*: foreign-born children who migrated to the U.S. apart

from their mothers. In all but one cause children migrated to the U.S. after mothers. All of the second generation and family migration participants were recruited from a high school afterschool program in the Bronx. In addition to being recruited from this location, some of the participants in the separated migration group were recruited from a high school afterschool in Westchester County.

Eligibility. Youth were identified by the afterschool director as potentially meeting the inclusion criteria. A formal eligibility screening was conducted by the afterschool director or the principal investigator. The inclusion criteria are as follows: (a) youth between the ages of 13-19 (b) foreign-born or U.S.-born to Caribbean parents. Eligible Caribbean countries included the 13 sovereign nations (Antigua and Barbuda, The Bahamas, Barbados, Cuba, Dominica, Dominican Republic, Grenada, Haiti, Jamaica, Saint Kitts & Nevis, Saint Lucia, Saint Vincent and the Grenadines, Trinidad & Tobago), and Guyana, (c) English proficient (d) youth must currently live with mother (e) mother migrated from country of birth to U.S. (no pattern of repeated migrations).

Table 3.1. *Demographic characteristics*

	2nd generation (***n*** **= 53)**	Family migration (***n*** **= 39)**	Separated migration (***n*** **= 32)**
Child characteristics			
Female	52.80	61.50	31.00
Young adolescents	69.80	48.70	46.90
Nativity			
Antigua & Barbuda	-	-	3.10
Dominican Republic	-	35.90	21.90
Guyana	-	15.40	6.30
Haiti	-	2.60	-
Jamaica	-	46.20	68.80
Mother characteristics			
Age	45.72 (6.79)	42.62 (6.67)	41.45 (5.88)
Married	56.60	48.70	31.30
Educational attainment			
Less than high school	7.00	19.40	12.00

High school/GED	34.90	25.00	44.00
Some college	27.90	41.70	24.00
Bachelor's degree +	30.20	13.90	20.00
Nativity			
Antigua & Barbuda	-	-	3.10
Dominican Republic	22.60	35.90	21.90
Guyana	13.20	15.40	6.30
Haiti	-	2.60	-
Jamaica	54.70	46.20	68.80
Saint Kitts & Nevis	5.70	-	-
Saint Lucia	3.80	-	-
Family characteristics			
Child lives with biological mother and father	47.20	41.00	6.30
Child lives with biological mother and stepfather	9.40	2.60	21.90
Child lives with mother and mother's partner	1.90	5.10	6.30
Child lives with mother alone	41.50	48.70	62.50
Child alternates living with mother and father	-	2.60	3.10
Father lives abroad	3.80	20.50	45.20
Child eligible for free/subsidized lunch	73.50	91.90	86.70

As shown in Table 3.1, majority of the sample was of Jamaican (56%) and Dominican (26%) descent and classified themselves as either lower-middle class (37%) or working class (44%). More than half (57%) of the participants did not currently live with their biological fathers with 19% of their fathers residing abroad. Youth in the sample indicated economic improvement as the chief reason for their mothers' migration to the United States. Overall, the average age reported by youth for their mothers was 43.57 (*SD* = 6.73) and many of the mothers were reported as earning a high school degree and attending some college. Table 3.1 provides a breakdown of

the demographic information of children and their families across the three migration groups. Table 3.1 also includes information on a categorical age variable that was created due to the uneven age distribution in the sample. Most of the sample (57%) were younger adolescents, ages 14 to 16.

Procedure

The project protocol was reviewed and approved by the Cornell Institutional Review Board. Both parental consent and child assent were obtained. Youth were invited to a classroom where they were given a unique ID number. Youth were given access to the Qualtrics survey that contained a demographic questionnaire and other study materials. After completion of the Qualtrics survey participants completed the online assessment of the Comprehensive Executive Function Inventory (CEFI). At the end of the study each participant was debriefed and compensated $20 for their time.

Measures

The CEFI measures a wide range of behaviors associated with executive function (Naglieri & Goldstein, 2014). The CEFI self-report form is standardized for use with youth ages 12 years and older. Although the full-scale score provides the best representation of youth's executive function skills, scores are generated for nine content areas of executive function: attention, emotion regulation, flexibility, inhibitory control, initiation, organization, planning, self-monitoring, and working memory (Naglieri & Goldstein, 2014). The nine subscales had and alpha coefficient of .96. A score on the full scale is not computed if the respondent omitted more than 5 items. If a respondent omitted more than one item on each subscale, a score for that subscale is also not computed. Scores on the full scale could not be computed for three participants in this sample.

The CEFI measure computes scores for consistency, negative impression, positive

impression, and time to completion with scores less than 75 on any of these indices indicates a potential response bias and a decreased confidence in the scores (Naglieri & Goldstein, 2013). Seven respondents provided responses that could be considered inconsistent. For example, a respondent may answer positively to a question stating they are able work well for a long period of time and also to a question stating they are unable to sit still for prolonged periods of time. Seven youth responded in a way that is unrealistically negative which may underestimate their functioning, while nine responded in a way that is unrealistically positive which may overestimate their ability. Two participants recorded an unusually fast time to completion. One participant did not complete the CEFI due to time constraints. The results below are based on revised sample with each of these problem cases removed. The Appendix contains the results with the problem cases retained.

The Authoritative Parenting Scale is a measure of authoritativeness including three subscales with nine questions on parental involvement, nine questions on parental autotomy-granting, and eight questions related to strictness and supervision. Each parenting characteristic is on a continuous scale. The involvement subscale (α =.83) and the autonomy granting subscale (α = .70) are both on a scale of 9 to 36. The original supervision subscale included two items about weekday and weekend curfews. These items did not load with the other items and were dropped. The supervision subscale now consists of 6 items (α = .75). These alpha coefficients are consistent with those reported in the original study (Steinberg et al. 1994) which ranged from .72 to .82 across all three dimensions. The present study will use only the parental involvement characteristic.

RESULTS

The average score on the executive function full scale for youth in the sample was roughly

101. This figure is on par with the average level of executive functioning reported in normative samples. Table 3.2 shows descriptive statistics of executive function across independent variables. Children of family migration reported higher levels of executive function than second-generation children and children of separated migration. Table 3.3 shows positive correlations between parental involvement and each measure of executive function. All correlations are significant at the .001 level. Increased parental involvement is associated with increased executive function abilities.

Table 3.2. *Mean and standard deviations of executive function skills by study variables*

	Executive functions			
	Full scale	*Flexibility*	*Inhibitory control*	*Working memory*
Age				
14-16-year-old	99.79 (*14.16*)	102.39 (*14.22*)	101.32 (*13.23*)	100.62 (*13.92*)
17-19-year-old	103.20 (*14.09*)	106.67 (*12.92*)	103.96 (*14.91*)	99.39 (*12.20*)
Gender				
Female	100.47 (*14.75*)	102.37 (*13.86*)	102.77 (*14.96*)	98.85 (*14.00*)
Male	102.00 (*13.64*)	106.26 (*13.50*)	107.18 (*14.29*)	101.73 (*14.45*)
Family structure				
Two parents	101.47 (*15.95*)	103.83 (*14.69*)	103.14 (*14.65*)	101.62 (*14.23*)
Single parent	101.47 (*12.63*)	104.08 (*12.85*)	102.88 (*12.92*)	99.75 (*11.40*)
Other	100.00 (*15.25*)	105.88 (*15.00*)	100.75 (*16.74*)	97.53 (*15.19*)
Migration group				
2nd generation	100.53 (*14.24*)	101.00 (*13.87*)	103.83 (*13.08*)	100.61 (*12.57*)
Family migration	104.53 (*13.80*)	109.53 (*13.18*)	104.03 (*13.56*)	101.50 (*13.55*)
Separated migration	98.12 (*14.18*)	103.31 (*12.79*)	98.80 (*16.08*)	97.23 (*13.22*)
Total	101.23 (*14.16*)	104.30 (*13.75*)	102.63 (*14.08*)	100.01 (13.04)

Four hierarchical linear regressions (Tables 3.4-3.7) tested for differences in overall executive function abilities, flexibility, inhibitory control, and working memory, respectively. In each analysis, the first step includes the control variables (age, gender, and family structure) which

were each significantly related to migration group, the second step adds two dummy coded variables for migration group with separated migration as the reference group, and the third step adds parental involvement to test whether this variable predicts executive function above the stressors of migration. In order to assess differences between each migration groups, the analyses were conducted twice with another set of migration dummy variables with second-generation as the reference group (analyses not shown).

Table 3.3. *Pearson correlation between involvement and executive function measures*

	Full scale	***Flexibility***	***Inhibitory control***	***Working memory***
Parental involvement	.425	.339	.447	.339

Consistent with the mean values reported in Table 3.2, none of the control variables significantly predicted overall executive function abilities for youth in this sample, $F(4, 92) = .362$, $p > .05$. Migration group also had no significant effect on overall executive function, $F(6, 90) = .866$, $p > .05$, see Table 3.4. Model 2 accounted for 5.5% of the variation in executive function. Parameter estimates did show a trending difference between children of separated migration and children of family migration, $p = .058$. There were no differences on the full-scale scores between the second-generation and family migration groups, $p = .295$, or between second-generation and separated migration groups, $p = .286$. The final model with the inclusion of parental involvement was significant and improved the amount of variance explained, $F(7, 89) = 3.533$, $p = .002$, $R^2 = .217$.

Table 3.4. *Hierarchical multiple regression predicting executive function full scale (Standardized regression coefficients)*

	Model 1	*Model 2*	*Model 3*

Gender *(vs. female)*			
Male	0.028	0.090	0.048
Age *(vs. 14-16-year-olds)*			
17-19-year-old	0.110	0.106	0.121
Family structure *(vs. two parents)*			
Single parent	-0.006	0.057	0.016
Other	-0.024	0.044	0.073
Migration group *(vs. separated migration)*			
Family migration		0.268^{t}	0.173
Second generation		0.151	0.062
Parental involvement			0.416^{***}

$^{t}p < .06$, $^{*}p < .05$, $^{**}p < .01$, $^{***}p < .001$

Turning to the specific executive function skills, a significant difference in scores on flexibility was found between migration groups (Table 3.5, model 2), $F(6, 94) = 2.291$, $p = .042$, $R^2 = .128$. Children of family migration had significantly higher flexibility scores than children of separated migration, $t(100) = 2.429$, $p = .017$, and second-generation children, $t(100) = 2.768$, $p = .007$. No difference between separated migration and second-generation groups was found, $t(100) = .142$, $p = .887$. The full model was significant, $F(7, 93) = 4.109$, $p = .001$, $R^2 = .236$ and differences in migration groups remained significant when parental involvement was included in the third step. Children of separated migration still had lower flexibility scores than children of family migration, $t(100) = 2.046$, $p = .044$, and likewise for second-generation children, $t(100) = 2.931$, $p = .004$.

Table 3.5. *Hierarchical multiple regression predicting flexibility (Standardized regression coefficients)*

	Model 1	*Model 2*	*Model 3*
Gender *(vs. female)*			
Male	0.113	0.193	0.170
Age *(vs. 14-16-year-olds)*			
17-19-year-old	0.139	0.101	0.098
Family structure *(vs. two parents)*			
Single parent	0.012	0.066	0.038
Other	0.079	0.127	0.138
Migration group *(vs. separated migration)*			
Family migration		0.318^{*}	0.255^{*}
Second generation		0.019	-0.047
Parental involvement			0.336^{***}

$^{t}p < .06$, $^{*}p < .05$, $^{**}p < .01$, $^{***}p < .001$

Results found no effect of migration group on inhibitory control scores (Table 3.6), $F(6, 92) = .976$, $p = .576$, $R^2 = .049$. However, the third model with parental involvement was significant, $F(7, 91) = 3.693$, $p = .001$, $R^2 = .221$. Similarly, there were no significant effect of migration group on working memory scores (Table 3.7), $F(6, 92) = .494$ $p = .812$, $R^2 = .031$. The assumption of normality of residuals was violated and so the working memory variable was log-transformed. The overall model with log-transformed working memory scores was not significant, $F(7, 91) = 2.025$. Again, parental involvement did significantly predict working memory scores,

t(98) = 3.301, p = .001.

Table 3.6. *Hierarchical multiple regression predicting inhibitory control (Standardized regression coefficients)*

	Model 1	*Model 2*	*Model 3*
Gender *(vs. female)*			
Male	0.087	0.137	0.093
Age *(vs. 14-16-year-olds)*			
17-19-year-old	0.031	0.053	0.069
Family structure *(vs. two parents)*			
Single parent	0.000	0.067	0.027
Other	-0.054	0.031	0.062
Migration group *(vs. separated migration)*			
Family migration		0.239	0.141
Second generation		0.234	0.141
Parental involvement			0.428^{***}

$^{t}p < .06$, $^{*}p < .05$, $^{**}p < .01$, $^{***}p < .001$

The results showed that parental involvement significantly predicted each measure of executive function. The R^2 change from models 2 to 3 in each regression analysis revealed the unique contribution of parental involvement. Parental involvement accounted for roughly 16% of the variance in overall executive function abilities. Parental involvement best predicted inhibitory control, explaining 17% of the variation while it accounted for less of the variance in flexibility (11%) and working memory (10%).

Table 3.7. *Hierarchical multiple regression predicting working memory (Standardized regression coefficients)*

	Model 1	*Model 2*	*Model 3*
Gender *(vs. female)*			
Male	-0.068	-0.045	-0.065
Age *(vs. 14-16-year-olds)*			
17-19-year-old	0.074	0.089	0.086
Family structure *(vs. two parents)*			
Single parent	-0.075	-0.040	-0.069
Other	-0.125	-0.075	-0.066
Migration group *(vs. separated migration)*			
Family migration		0.128	0.066
Second generation		0.127	0.062
Parental involvement			0.329^{***}

$^{t}p < .06$, $^{*}p < .05$, $^{**}p < .01$, $^{***}p < .001$

DISCUSSION

The primary objective of this paper was to expand an area of research that may have much to offer with regard to deepening our understanding of the academic outcomes of immigrant children. Some have argued that the inconsistent results regarding the academic achievement of immigrant children may owe to the variation in measurement choices (Duong et al., 2016). Most studies on academic outcomes with immigrant children utilize traditional measures of academic

performance such a grade point averages and achievement tests. There has long been debate about the subjectivity of grades and the difficulties teachers face in using the metric (Allen, 2005). Assigning grades is a complicated process and teachers are sometimes influenced by factors outside of the student's ability. A recent study showed that teachers use stereotype-based judgements when evaluating the academic performance of students from migrant backgrounds and teachers appear to have more positive expectations about students from non-migrant backgrounds (Bonefeld & Dickhäuser, 2018). These findings are consistent with other research showing teacher biases against racial and ethnic minority students (Burgess & Greaves, 2013; van Ewijk, 2011). In response to these issues, the present study sought to depart from conventional studies on the topic by advancing a developmental approach. The main argument is that by examining an underlying developmental process, like executive function, an unbiased estimate of cognitive ability is provided.

Executive function is also more likely to be sensitive to two aspects of migration, acculturative stress and parental separation, the latter of which remains grossly underexplored in studies of the educational outcomes of immigrant children despite the prevalence of the phenomenon and the findings from the little research that has been done showing a negative association between parental separation due to migration and academic performance (Suarez-Orozco, 2008). This brings us to the second objective of this paper which was to show that the heterogeneity of immigrant children relates to much more than racial and ethnic differences. Immigrant children can be distinguished from one another on the basis of their migration experience. Some first-generation children migrate to the country with their mothers, while some experience maternal separation. The relevance of executive function is once more brought to the

fore when one ponders how experiencing parental separation during a period when executive function is developing and susceptible to environmental input.

Taken together, a potential reason for the observed disparities in academic outcomes could be due to differences in the migration experience of foreign-born, which in turn impact on pivotal developmental pathways. The purpose of this paper was to explore whether executive function abilities varied across three groups of Caribbean immigrant teens. An overall measure of executive function was analyzed and found no significant differences between the three migrant groups, though a slight trend to significance was observed between children of family migration and children who were separated from their mothers due to migration. These findings contradict the study hypotheses which predicted that children of separated migration would report significantly lower executive function scores than both groups and that second-generation children would report the highest executive function scores.

The findings did lend support to the alternative hypothesis that the broader caregiving environment exerts a stronger influence on executive function than the stressors associated with migration for foreign-born children in this sample. Parental involvement not only predicted overall executive functioning, but also significantly predicted each individual executive function skill. The reason for this positive relationship is intuitive; children with more involved parents receive the care and attention necessary to support healthy development (Blair et al., 2014). A previous study did not find that parental involvement predicted executive function in a sample of German children and adolescent, but instead found responsible parenting and inconsistent were significant determinants (Sosic-Vasic et al., 2017). This opens up the question of whether different parental characteristics are more relevant to executive function development for certain groups. Future research may seek to investigate this question by including immigrant children from different

countries of origin and identifying which parental characteristics are more salient to executive function for each group. It also bears nothing that other scholars have argued that many Caribbean parents work multiple jobs, and this often decreases their ability to participate in their child's school life (Morrison & Bryan, 2014). Perhaps parental involvement so significantly predicts executive function in this sample because it is related to amount of time parents are able to spend with their children. Future work may want to disentangle this relationship. Additionally, a relationship between parental involvement and migration group was previously found, with separated children reporting less involved parenting (Cassells, forthcoming). In this reduced sample, however, this was not found to be the case. Future studies with a larger sample size may seek to replicate these findings and extend the analysis to include parental involvement, or other parental characteristics, as a mediator between migration group and executive function.

Another way to view the results is to explore individual executive function skills. Ununiformed results were found across the three core components of executive function; inhibitory control, cognitive flexibility, and working memory. Diamond (2013) makes the case for the executive function as a series of independent elements and Miyake et al. (2000) work shows that whether or not an integrative executive function model exists, the separated parts do relate differently to outcomes. The paper explored whether the factors associated with migration affect certain elements of executive function and not others. From this paper we find that inhibitory control and working memory are areas that appear unaffected by the stressors of migration and maternal separation whereas we find some evidence of a family migration advantage in cognitive flexibility. Cognitive flexibility has been defined in terms of attention shifting, task-switching, and the ability to engage in flexible thinking in the face of new environmental input (Buttelmann & Karbach, 2017). In a word, cognitive flexibility demands adaptiveness. When understood in

this way, it becomes evident why foreign-born children would have the advantage over second-generation children in cognitive flexibility. Successful assimilation depends on the immigrant's ability to adapt to a new environment (Berry, 1997). Migrant children, especially those who migrate during the preschool years when executive function is rapidly developing, may need to engage with this ability more so than native-born children which may contribute to pronounced differences in this ability in later life.

Of course, not all foreign-born children in this sample demonstrated high levels of cognitive flexibility. Children of separated migration had significantly lower cognitive flexibility than children of family migration and showed no difference to the second generation. Here partial support is found for the hypothesis that maternal separation undermines executive function ability. One way to clarify the findings between the two groups of first generation immigrant children would be to explore whether age of migration and age of separation moderate the relationship between migration group and cognitive flexibility. The idea is that whilst one group of immigrant children might be arriving to the United States in earlier life, another group is being separated from their mothers at that time. The timing of the separation may induce elevated cortisol levels in the separated child and undermine healthy cognitive flexibility development. On the other hand, the age of migration without separation might support advanced cognitive flexibility. The net result may be that these two groups of immigrant children on are positioned on divergent paths towards academic success. The discrepant findings in regard to the academic outcomes of immigrant children may owe to the fact that some first-generation children might perform similar to the second-generation depending on their experience in migration.

Furthermore, an issue that remains unresolved is how mental health may be implicated in the academic performance of children who experienced separation. A direct link between maternal

separation and academic performance has been demonstrated (Gindling & Poggio, 2012). The mechanism underlying this relationship has yet to be explored. One possibility is that maternal separation incites psychological problems that then affects academic outcomes. In fact, immigrant children categorized as precipitous decliners and who also experienced problematic separations were found to have the most psychological symptoms that remain consistent over time (Suárez-Orozco (2008). On the other hand, high achievers had the lowest psychological symptoms that remain low over time and were less likely to experience a problematic separation from a parent due to migration Suárez-Orozco (2008). One reason we might expect to see differences in academic outcomes is due to emotional and behavioral differences across migration groups. Cassells (forthcoming) found that the differences in mental health among separated children are accounted for by attachment anxiety. A follow-up study may want to test attachment as a mediator in the relationship between migration groups and executive function, especially given the recent work showing the impact of secure attachment on executive function development (Bernier, Beauchamp, Carlson, & Lalonde, 2015). Executive function should then be linked to a measure of academic performance to complete the model.

The lack of a measure of academic achievement is one limitation of this study. Many of the conclusions drawn here must be taken with caution until more work in this area is conducted. Relatedly, that working memory showed no differences is surprising considering that some research suggests that it may play an active role in the regulation of affective states (Hofmann, Schmeichel, & Baddeley, 2012). Emotional problems are often reported among children that were once left behind (Graham & Jordan, 2011). One reason for the null finding may be related to a second limitation of this study and that is the use of a subjective measure of executive function. It is possible that behavioral measures of working memory in particular are more appropriate than

self-report. Indeed, the working memory subscale had the significant variability compared to the other subscales. Additional research on the working memory of separated children and its relationship to affect regulation may want to employ a behavioral measure of working memory.

Another limitation of the study was the diversity within the sample. It is possible that some of the effects of muted by this diversity. A study that focuses on one country in the Caribbean may be reduce some of the noise in the data. For example, an alternative reason why the family migration group might have slightly better executive function may be due to linguistic diversity within the Caribbean that is reflected in the present sample. Although eligibility for the study require participants to be fluent in English, this does not preclude second language ability. The demographic breakdown shows that the family migration group had the highest percentage of children from the Dominican Republic. It is reasonable to expect that some of these children are exposed to a second language at home and may themselves be bilingual. Therefore, it is possible that this finding supports existing work showing an association between bilingualism and an executive function advantage (Krizman et al., 2012). In the absence of a measure of second language ability, ethnicity is used as a proxy for language. This strategy is not without its problems, but results from the study found that ethnicity was not significantly related to migration group and did not predict executive function ability. A future study may seek to contextualize these findings by matching participants on important demographic characteristics and exploring the role of second language ability across these groups of immigrant children. Future research may also want to explore if the executive advantage of family migration carries over to higher grade point averages or standardized tests.

Immigrant children represent the fastest growing demographic in America. The future of America depends on the support provided to immigrant children by educators, practitioners, and

policy-makers. It is necessary to identify the factors that contribute to academic success of these students in order that programs and policies that support their development can be enacted. The findings of the present study may be useful to educators who seek to design culturally sensitive curricula. Practitioners may also seek to design executive function interventions that can support the development of these skills for immigrant children (Blair, 2016).

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APPENDIX

Chapter 2:

Regression results for attachment avoidance with outliers removed are as follows: The regression model is not significant, $F(4, 117) = .940$, $p = .44$, and predicted only 3% of the variance in attachment avoidance. There were no differences observed between age, gender, and the dummy coded migration variables, all *p*s > .05.

Chapter 3: Analyses with outliers retained.

Linear Regression Analysis with migration group predicting parental involvement

Variable	*B*	*SE B*	*β*
Gender	0.73	0.94	.07
Age	0.01	0.94	0.00
Joint migration[a]	0.22	1.06	0.02
Separation migration[a]	-2.35	1.12	-0.21*
R^2		0.46	

[a]Second-generation children are the reference group.
*$p < .05$

Summary of hierarchical regression analysis with attachment variables predicting mental health (N = 123)

	Model 1			Model 2		
Variable	*B*	*SE B*	*β*	*B*	*SE B*	*β*
Male[a]	-2.77	0.95	-0.26**	-2.16	0.86	-0.19**
Attachment Avoidance				0.92	0.36	0.23**
Attachment Anxiety				1.52	0.46	0.29***
R^2		0.06			0.24	
F for change in R^2		8.48**			15.48***	

[a]Female is the reference group.
**$p < .01$. ***$p < .001$.

Summary of hierarchical regression analysis with parenting variables predicting mental health (N = 121)

	Model 1			Model 2		
Variable	*B*	*SE B*	*β*	*B*	*SE B*	*β*
Male	-2.71	0.97	-0.25**	-2.36	0.87	-0.22**
Involvement				-0.38	0.10	-0.34***
Autonomy Grant				-0.26	.10	-0.20**
Supervision				-0.30	.23	-0.12
R^2		0.06			0.27	
F for change in R^2		7.86**			11.04***	

Reference group = female.
**$p < .01$. ***$p < .001$.

Summary of hierarchical regression analysis with attachment and parenting variables predicting mental health

	Model 1			Model 2		
Variable	*B*	*SE B*	*β*	*B*	*SE B*	*β*
Male	-2.71	0.97	-0.25**	-2.04	0.85	-0.19*
Avoidance				0.22	0.41	0.06
Anxiety				1.38	0.47	0.26**
Involvement				-0.22	0.11	-0.20
Autonomy Grant				-0.26	0.10	-0.21**
Supervision				-0.25	0.22	-0.10
R^2		0.06			0.33	
F for change in R^2		7.86**			9.23***	

*$p < .05$. **$p < .01$. $p < .001$.

Chapter 4: Executive function analyses with problematic cases retained.

Hierarchical multiple regression predicting executive function full scale (Standardized regression coefficients)

	Model 1	*Model 2*	*Model 3*
Gender *(vs. female)*			
Male	0.086	0.150	0.110
Age *(vs. 14-16-year-olds)*			
17-19-year-old	0.120	0.087	0.108
Family structure *(vs. two parents)*			
Single parent	-0.016	0.028	-0.004
Other	-0.097	-0.041	-0.008
Migration group *(vs. separated migration)*			
Family migration		0.279*	0.175
Second generation		0.097	0.002
Parental involvement			0.381***

$^{t}p < .06$, $^{*}p < .05$, $^{**}p < .01$, $^{***}p < .001$

There was no difference between second-generation children and family migration on scores on the executive function full scale, $t(118) = 1.825$, $p > .05$ in model 2. The same result was found in model 3, $t(118) = 1.832$, $p > .05$.

Hierarchical multiple regression predicting flexibility (Standardized regression coefficients)

	Model 1	*Model 2*	*Model 3*
Gender *(vs. female)*			
Male	0.117	0.180^{t}	0.156
Age *(vs. 14-16-year-olds)*			
17-19-year-old	0.128	0.072	0.076
Family structure *(vs. two parents)*			
Single parent	0.037	0.058	0.036
Other	0.006	0.042	0.058
Migration group *(vs. separated migration)*			
Family migration		0.297**	0.224*
Second generation		-0.024	-0.095
Parental involvement			0.307***

$^{t}p < .06$, $^{*}p < .05$, $^{**}p < .01$, $^{***}p < .001$

Children of family migration had higher scores on cognitive flexibility than second-generation children, $t(122) = 3.295$, $p = .001$ in model 2, which remained in model 3 with parental involvement included, $t(122) = 3.400$, $p = .001$.

Hierarchical multiple regression predicting inhibitory control (Standardized regression coefficients)

	Model 1	*Model 2*	*Model 3*
Gender *(vs. female)*			
Male	0.080	0.135	0.096
Age *(vs. 14-16-year-olds)*			
17-19-year-old	0.040	0.042	0.063
Family structure *(vs. two parents)*			
Single parent	-0.066	-0.002	-0.031
Other	-0.127	-0.051	-0.018
Migration group *(vs. separated migration)*			
Family migration		0.238^{t}	0.137
Second generation		0.206	0.112
Parental involvement			0.369^{***}

$^{t}p < .06$, $^{*}p < .05$, $^{**}p < .01$, $^{***}p < .001$

There was no difference in inhibitory control between children of family migration and second-generation children, $t(120) = .427$, $p > .05$ in model 2, or in model 3, $t(120) = .329$, $p > .05$.

Hierarchical multiple regression predicting working memory (Standardized regression coefficients)

	Model 1	*Model 2*	*Model 3*
Gender *(vs. female)*			
Male	0.052	0.084	0.063
Age *(vs. 14-16-year-olds)*			
17-19-year-old	0.129	0.117	0.121
Family structure *(vs. two parents)*			
Single parent	-0.094	-0.068	-0.090
Other	-0.173	-0.136	-0.122
Migration group *(vs. separated migration)*			
Family migration		0.148	0.077
Second generation		0.064	-0.005
Parental involvement			0.301^{***}

$^{t}p < .06$, $^{*}p < .05$, $^{**}p < .01$, $^{***}p < .001$

There were no differences in working memory (log-transformed) between children of family migration and second-generation children, $t(120) = .852$, $p > .05$ in model 2, or in model 3, $t(120) = .835$, $p > .05$.