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A Typology of Foster Home Quality Elements in Relation to Foster Youth Mental Health

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A Typology of Foster Home Quality Elements in Relation to Foster Youth Mental Health

by

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Abstract

Foster care has been one of the primary interventions in society's efforts to address child maltreatment. The foster parents and foster homes follow a process of certification intended to ensure that maltreated children be placed in substitute care that supports and encourages positive outcomes. One of the outcomes of principle concern is mental health. Few studies have been conducted that explore the makeup of certified foster homes with respect to the cumulative impact of multiple indicators of quality on mental health outcomes of foster youth.

This study sought to identify a typology of foster homes based on theorized indicators of quality and utilizing a dataset from the Supporting Siblings in Foster Care intervention. Hierarchical agglomerative cluster analyses, k-means cluster analyses, and Latent Class Analyses were separately conducted to develop typologies. Differences in group means of indicator variables were used to suggest characteristics of different foster home types. ANOVA and multivariate hierarchical linear regression were used to explore differences in mental health measures at baseline and over time between types of foster homes.

Results indicated distinct typologies using the different clustering methods. In addition, foster home types characterized by a higher prevalence of kinship care and sibling togetherness were generally associated with lower estimated scores on several standardized mental health measures. Other variables were indicative of foster home type but were inconsistent in terms of their impact on mental health outcomes. These included foster parent education and experience, household size and income, length of placement

and contact with biological parents. Implications for research, policy, programs, and practice are discussed.

Acknowledgements

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Chapter 1: Introduction

Placing children in foster homes is a temporary intervention designed to protect and improve the safety, permanency, and well-being of vulnerable children who have been removed from their biological households due to maltreatment. The intent of this practice is that the child's new, substitute home will replace an environment that was deemed dangerous to his or her physical and emotional health in favor of an environment wherein the child will be parented in a manner more conducive to normal development. By intervening in the lives of maltreated children, foster care (as a component of the child welfare system) strives to positively impact the developmental trajectory of children who are at significantly higher risk for experiencing a host of negative outcomes compared to their non-foster counterparts (Clausen, Landsverk, Ganger, Chadwick, & Litrownik, 1998; Pecora, 2012).

This thesis seeks to understand how specific characteristics of foster homes contribute to one particular domain of child-level outcomes: mental health. This thesis first introduces foster care as an intervention in the context of governmental responsibility to care for children. This includes a review of the overarching goals of the federal child welfare system and regulatory policies that mandate foster home certification and monitoring. This is followed by a review of the literature on what is known in terms of foster home environmental elements, the efforts of foster parents, and their association with mental health outcomes of the youth. Findings from the literature review inform specific research questions that are subsequently addressed through exploratory and confirmatory data analytic strategies. The thesis concludes with a

discussion of the implications of the findings for research, practice, and policy for child welfare researchers and practitioners.

Governmental Intervention for Maltreated Children

Under the natural order of propagation of humankind and the reproduction of the species, offspring are entirely dependent on a parent for survival. In American society, parents are both afforded the right and expected to raise children with adequate support to facilitate positive growth and development. Nevertheless, the government plays a role in the oversight of childrearing by maintaining the power to supersede the rights of parents when there is evidence of child abuse or neglect. This governmental power to intervene is based on the concept of parens patriae (parent of the nation) and suggests that an overseeing body may intercede in cases where a family is unable or unwilling to keep a child safe (Goldman, Salus, Wolcott & Kennedy, 2003).

Founded on this ideal, policy and laws (e.g., the Child Abuse Prevention and Treatment Act of 1974, the Adoption and Safe Families Act of 1997, the Family First Prevention Services Act of 2018) have been developed that define neglect and abuse and authorize state child welfare agencies to intervene in the private lives of families. These interventions exist on a continuum that ranges from providing education and support to the disintegration of parental rights. In cases where it is found necessary to remove a child from his or her biological parent(s), the government places the maltreated child into what is anticipated to be a safer foster home.

Trends over time have fluctuated regarding the specific number of children in care, but the number has been consistently high for decades. The most recent estimates according to published data collected by the Adoption and Foster Care Analysis and

Reporting System (AFCARS), suggest that approximately 407,000 children lived in foster care at the end of fiscal year 2020, which represents a 3.8% increase since 2011 (U.S. Department of Health and Human Services, Administration for Children and Families, 2021). Identifying a home and placing the child into foster care represents a dramatic step in the intervention. Once the child has entered the foster care system, the child welfare system continues to act as their representative, working to ensure that a child is safe and cared for until they exit foster care.

The primary objectives for this population have been explicitly outlined by the U.S. Department of Health and Human Services, Administration on Children, Youth and Families and are summarized as: safety, permanency, and well-being (ACF Info Memo 4-17-2012). As a temporary intervention, foster care is intended to contribute to the safety of the child by providing a living environment free of threats of harm and where services can be delivered according to the child's specific needs. Foster care is not intended as a permanent placement, however the impact of foster care on a child's well-being may endure far beyond the duration of the placement.

Well-being is a construct that encompasses a child's cognitive functioning, physical health and development, and his or her behavioral, emotional and social functioning (Lou, Anthony, Stone, Vu & Austin, 2008, cited in the ACF Memo)—areas known to be impacted by foster care (see National Research Council and Institute of Medicine, 2000; Perry, 2005; Cook, Blaustein, Spinazzola & Van der Kolk, 2003; Bloom, 1999, Terr, 1991, Griffen et al., 2011 as cited in the ACF 04/17/2012 Memo). Ensuring that a foster placement is safe and beneficial to the well-being of a child is complicated by the heterogeneity of foster homes and foster families.

Attempts to ensure that a foster home is safe and supportive are made by way of state level policies and procedures on assessment and certification. Certification suggests that a foster home has adequately been vetted and meets the requirements to provide care. However, the quality and efficacy of certified foster homes vary substantially from one home to another. Little has been done with respect to understanding the range of foster home quality and the salient characteristics that contribute to it.

The dearth of research raises questions about the ability of the child welfare system to improve the well-being and safety of the children in their care. Established policies and procedures guide child welfare administrators in determining whether to certify a foster parent. Policies have also been outlined to direct practitioners to provide ongoing monitoring of certified foster homes. These policies are extensive (as will be demonstrated) and have high face validity in the context of foster home quality assurance. However there is limited empirical evidence that suggests that foster homes accurately reflect the expected quality outlined in administrative policies.

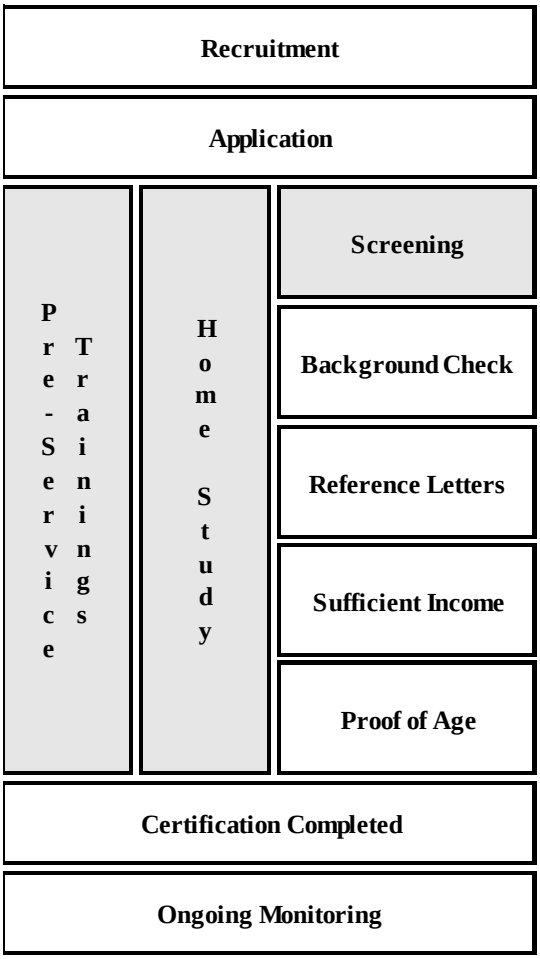
Studies on foster homes have been limited to reporting the results of a handful of standardized instruments that assess a small number of distinct components of foster parenting, foster parent characteristics, or foster parent attitudes and are often ancillary measures to the questions related to the foster child's behaviors, disorders or educational outcomes. In the case of research focused on foster parents, studies are often qualitative and composed of very small samples. For example, Berrick and Skiveness (2012) assessed a group of high-quality foster homes as a way to understand dimensions of high-quality foster care. Theirs was a qualitative study of a purposive sample of 141 foster parents identified as "exemplary." While useful in some respects, their study specifically

examined a unique sub-group of foster parents rather than looking at the normative foster parent population. In suggesting why their study was necessary, Berrick and Skiveness (2012) identified the paucity of similar research and echoed the previously expressed sentiment for the need for more research on the nature of foster parents and foster homes.

This thesis is focused on addressing the gap in the literature relative to (a) enhancing our understanding of the most critical elements of foster homes that are associated with quality, (b) identifying a typology of foster homes derived from those elements, and (c) exploring how specific types of foster homes impact the mental health of foster youth. Findings have the potential to inform future child welfare research, policy, and practice including foster home certification and efforts to monitor and train foster parents. The overarching and long-range goal is to provide more clarity on how to improve the lives of foster youth by improving the efficacy of foster care as an intervention.

A review of the details of the current process (see Figure 1.1) serves as a foundation for understanding how foster care quality has been operationalized through policy mandates at the federal and state levels. Filling the pool of effective foster parents begins with federal and state level efforts at recruitment. Recruitment is followed by assessment and certification and continues with ongoing monitoring and training.

Figure 1.1 Foster Parent Certification Process



Recruitment of Potential Foster Caregivers

Public child welfare agencies and private agencies that provide foster care services via contract (McBeath, Collins-Camargo, & Chuang, 2012) are responsible for the recruitment, certification, and retention of foster parents. Building a pool of adequate foster homes begins by advertising and inviting prospective foster parents to apply for certification. Child welfare agencies seek to constantly maintain sufficient numbers of available foster parents due to the unpredictable level of need and the urgency that exists

when placing a child into a substitute home. Without available foster parents, a child may languish in an unsafe environment while a placement is identified.

Significant resources are dedicated to recruiting potential foster parents to meet the persistent need. To accomplish this task, agencies disseminate information about the need for foster caregivers via mass media, personal contacts with current foster parents, and through community organizations (Cox et al., 2002). The process is informed by eight federal requirements, specific to the tactics used for recruitment. Agencies are to: (a) describe characteristics of waiting children, (b) strategize to reach all parts of the community, (c) use diverse methods to disseminate information, both general and child-specific, (d) ensure that all prospective families have access to the home study process, (e) train staff to work with families from diverse cultures, races and economic situations, (f) deal with linguistic barriers, (g) develop a non-discriminatory fee structure, and (h) ensure a timely search for prospective parents awaiting a child (Adoption Exchange Association, 2015a).

These efforts are designed to attract as many potential applicants as possible rather than select the most outstanding candidates. Nationally, the need for foster parents is an ongoing problem and is echoed in a familiar recruitment tagline "You don't have to be perfect to be a parent. Thousands of kids in foster care will take you just as you are" (Adoption Exchange Association, 2015b). Recruitment is therefore designed to get prospective foster parents to consider completing a foster parent application. Once recruited, filtering out unacceptable applicants is an expected outcome of the certification process.

Characteristics of Foster Parent Applicants

Empirical knowledge concerning the characteristics of foster parent applicants is limited (Orme et al., 2004), making it difficult to determine the effects of current recruitment efforts in attracting qualified foster parents. However, at least one study has been done on the topic and offers a glimpse of the makeup of one sample of applicants. Specifically, Orme and colleagues (2004) found that among 161 individuals, 61.5% were married, 73.2% lived in a single-family home, 14.3% made under $20,000 per year, 60.1% made between $20,000 and $55,000 per year, and 56.3% had no children in the home. In addition, 27.4% of the women identified as African American and 70.7% of the women identified as White. Of men, 15.5% and 83.5% identified as African American and White respectively. Regarding education, 43.3% of the women and 49.5% of the men had at least a two-year college degree. As for employment, 75.2% and 88.3% were employed full time for women and men respectively (Orme et al., 2004). They also assessed psychosocial functioning with various measures (the Social Support Behavioral Scale, Dyadic Adjustment scale, Partner Abuse Scale, Family Assessment Device-General Functioning Subscale, Brief Symptom Inventory, Adult-Adolescent Parenting Inventory). They found that approximately one quarter of the applicants exhibited problems on the family and the friend scale of the Social Support Behavioral Scale, 5.4% of women and 12.1% of men had problems on the Family Assessment Device-General Functioning Scale, and 8.3% of women and 14.6% of men had problems on the Brief Symptoms Inventory. Perhaps the most telling statistic was found with the Adult-Adolescent Parenting Inventory scores, which suggested that from 6.4%-24.3% of applicants fell into the undesirable category on 4 subscales (developmental expectations,

empathy, punishment and role clarity) and up to 5.1% fell into the 'potentially abusive' category (Orme et al., 2004).

Beyond demographics, some research has been done with respect to the problems related to recruitment and developing a pool of foster parents. In a 2008 study, Colton and colleagues described challenges related to the recruitment and retention of foster parents. They suggested that some licensing standards may have been too stringent and that agencies may have been confusing 'good enough' with 'optimal' in regard to the expectations of foster parents. Contributing to the issue was the lack of assessment measures suitable to measuring parenting adequacy (Colton, Roberts & Williams, 2008).

There are significant costs associated with all phases of processing an applicant from the point of recruitment and throughout certification. Researchers have suggested that future research should include a focus on cost-effectiveness of current recruitment, certification, and training strategies. It has also been suggested that targeting potential foster parents with a certain level of aptitude and who possess certain desirable characteristics may be an important adaptation that should be considered in the process of establishing a strong pool of qualified foster parents (Orme et al., 2004).

The Application Process

If recruitment is successful and an individual is able to move forward with certification, the application and screening processes begin. These steps are required of all recruits and represent the primary filter for exclusion. The procedures vary from state to state and follow state-specific policies for certification. For this thesis, specifics of the application and home study processes for Oregon serve as a reference. The Oregon-

specific policies also contribute to operationalizing the construct of quality used in subsequent sections.

The Oregon application includes materials that are used to indicate whether an individual or couple possess characteristics and have the adequate resources to care for foster children. The applicant is required to provide demographic information such as income, education level, and family size as well as reference letters from employers, friends, and acquaintances. The reference letters provide an additional perspective of the applicant's character and add an element of objectivity to the application.

Applicants must also pass a criminal background check. Individuals are excluded for felonies involving endangerment of a child, violent or sex crimes, or any history of spousal abuse. Proof of age is also required, 21 is the minimum age in Oregon and most other states though there are some that allow 18-year-olds to provide care. They must also demonstrate income sufficient to meet their basic needs. After the application has been accepted, and prior to certification, the applicant participates in training and education while a home study and the remainder of the certification process take place (Oregon Department of Human Services, 2015).

The Home Study Process

The home study is intended to ensure that a minimum standard of living is met. National standards have been set forth and are the basis for state-identified requirements (Table 1.1). The national standards were developed in conjunction with recommendations provided by national organizations such as the Child Welfare League of America and the Council on Accreditation for Children and Family Services (42 U.S.C. 671 (a) (10)). Individual states are required to detail the process used to determine whether they

meet national standards and are required to identify an authoritative agency responsible for ensuring adherence to the guidelines.

Table 1.1 Expectations of Foster Parenting (Grimm, 2003)

CWLA Standards suggest an understanding of…
• The strengths and needs of foster children and their families
• The critical nature and impact of separation and loss for all involved in foster care
• The laws, regulations, policies and values that direct child welfare and foster care
• The role of foster parent as effective and essential members of the foster care team and how the team operates within the agency
• Policies on discipline, confidentiality, substance abuse, and HIV/AIDS
• Health and safety procedures, including first aid, CPR, HIV/AIDS precautions, policies on psychotropic medication, and emergency procedures
• The importance of developing cultural competency
• The impact of fostering on foster parents, their children, and all aspects of family life

In the State of Oregon, assessing the physical environment is broken into two components: safety, and health. Both areas of certification have concrete, demonstrable indicators of acceptability but also require a significant degree of judgment to be made by the certifier. For example, certifying "adequate space" for each household member or a "reasonable knowledge" of the use of first aid equipment are two such requirements. Another example it that single-parent homes have a four-child maximum (including birth and foster children) and in homes with two certified adults, there can be no more than seven children (only two of which can be under the age of three). Table 1.2 provides a detailed list of criteria of a healthy physical environment.

In contrast to the more objective exercise of assessing the physical structure and amenities of the home, certifying the parents in terms of their character and likely parenting practices is a less objective task. Guidelines range from determining whether an individual is capable of managing his or her home and personal life to having the mental

and physical capacity to care for a child (Oregon Department of Human Services, 2011, p. 9).

Table 1.2 Certifying Criteria for the Home (OR Policy II-B.1 413-200-0301 through 0396)

Maintenance of a Safe Physical Environment
• Must be the primary residence of the child
• Must have adequate space for each member of the household
• Must have appropriate sleeping arrangements
• May not use electronic monitoring
• Must have access to a working telephone
• Safeguards must be in place for swimming pools and other water hazards
• Outdoor tools and equipment, machinery, chemicals, etc. are stored safely
• Animals are cared for properly and kept in compliance with local ordinances
• Access to potentially dangerous animals is restricted
• Hunting or target practice are allowed only with authorization from the caseworker
• Hunting and sporting equipment (e.g. knives, spears, arrows) must be securely stored
• Must have suitable smoke and carbon monoxide alarms and adequate paths of exit in case of emergency
• Must not have bars on bedroom windows without adequate release mechanisms
• Each bedroom must have one unrestricted exit and at least one secondary means of exit
• A child must have unrestricted, direct access at all times to hallways, corridors, living rooms, or other common areas

Demonstrating adequacy in most of these areas is contingent on context and challenging to do with accuracy. Doing so would require monitoring applicants in various situations that elicit natural behavior which is not realistic given the constraints of the child welfare system.

The complexity of certification increases with household-level requirements. Applicants are required to ensure that all adult members of the household possess similar, suitable characteristics and will cooperate with the certifying agency. Table 1.3 illustrates the individual and family characteristics that are assessed.

The process of determining the character of the adult members of the household involves conducting individual interviews with each household member. Similar to the applicant's required external letters, four references are contacted for each additional adult member of the household. Guided by agency-developed questionnaires, interviewers gather specific information on the applicant's potential as a parent. Examples of questions asked in these interviews include: "Describe the personality and characteristics of each applicant (*outgoing, honest, calm, quiet, fun, compulsive, flexible, hardworking, rigid, emotional, etc.)*" and "What type of experience does each applicant have with children?" (OAR 413-200-0270 (6g). Interviewees are asked to assess how the applicant would discipline children and what expectations he/she would have for children. They further assess the applicant's social support system, whether the interviewee has ever left his or her child(ren) in the care of the applicant and if he/she feels that the applicant is capable of making a long-term commitment to foster parenting. The interviewer then identifies 12 potential red flags (e.g., excessive alcohol use, violent behavior, mental illness) and asks whether the applicant has ever dealt with any of them (Oregon Department of Human Services, 2015a). After approving the application, passing the home study and receiving an endorsement from references, certification is granted and the applicant becomes a foster parent.

Table 1.3 Certifying Criteria for Foster Parents (OR Policy II-B.1 413-200-0301 through 0396)

Individual Parent Requirements
• Must possess the ability to manage one's home and personal life
• Can maintain conditions in the home to provide safety, health and well-being for the child
• Has supportive relationships with adults and children living in the household and with others in the community
• Has a lifestyle free of criminal activity and abuse or misuse of alcohol or drugs
• Has adequate financial resources to support the household independent of the monthly foster care payments
• Willingly participates in the home study process including a comprehensive inquiry into his/her personal and family history and family dynamics
• Has the physical and mental capacity to care for a child or young adult, willing to provide copies of medical reports from health care professionals or complete an expert evaluation
• All adult members of the household must possess similar characteristics and willingness to comply with inquiries, record checks, and potential evaluations
Family Requirements
• Must use effective child-rearing practices that contribute to a child's growth, development, building positive personal relationships and self-esteem
• Child-rearing practices must be positive using non-punitive discipline
• Ensure that the child learn and have the opportunity to practice good hygiene
• Respect and support child welfare efforts at developing and maintaining relationships between the child and his or her birth family, relatives or other significant individuals
• Respect the spiritual beliefs, lifestyles, sexual orientation, gender identity, disabilities, national origin, and cultural identities of each child
• Provide opportunities to enhance the positive self-concept and understanding of the heritage of the child
• Work in partnership with child welfare to identify the strengths and meet the child's needs
• Follow-through and comply with prescribed services, activities, supervision plans, personal care service plans, visitation plans, transition plans and restrictions for each child
• Use reasonable efforts to prevent anyone from influencing the child regarding allegations in a judicial or administrative proceeding in which the family or legal guardian of the child, the child, or another individual may be involved.

Critiques of the Certification Process

According to child welfare researchers and advocates, some of the specifics of the state certification process may be the cause of some concern. In Oregon, the home study is scheduled *after* the applicant has been assigned a worker and undergone pre-service training. The order of this process should be considered from a risk management context.

On the one hand, applicants who are not willing to undergo pre-service training may screen themselves out, reducing the workload of certifiers. On the other hand, requiring applicants and certifiers to invest significant time and energy in the certification process prior to conducting the home study may inadvertently bias certifiers towards leniency, as if to reward potential applicants for effort put forth rather than demonstrated competency. In contrast, if a home study were conducted as a screening, prior to trainings, then the results of that home study might be more instructive as to whether continued efforts towards certification would be worthwhile.

An additional concern of the process is that the determination to certify could be too subjective and reductionistic. For example, as the certifier carries out the home study, he/she completes a two-page list of summarized requirements, each with an associated box to be checked (in the case of compliance) or left blank (Oregon Department of Human Services, 2011a). This requires the certifier to distill the environmental quality into a "satisfactory"/" not-satisfactory" classification. While the regulations seem valid at face value and can be connected to empirically supported theories of child development (e.g., positive parenting, mental health of caregivers, and financial resources (Forgatch & Patterson, 2010; Patterson, Forgatch & DeGarmo, 2010; Beardselee, Versage, & Giadstone, 1998; Beardselee et al., 1996; Brooks-Gunn & Duncan, 1997; Chilton, Chyatte, & Breaux, 2007)), some utility is lost by forcing the result of the lengthy and costly process into system of either passing or failing.

Certification Assessment Tools

Instruments have been developed that reflect national and state policies on certification standards and assess theoretically sound foundations for positive child

outcomes. Instruments that may be used as a component of certification assess a smaller set of elements connected to positive child outcomes rather than providing a means for a thorough examination of the potential foster home. An example of those elements found in one instrument include whether a foster home is "child centered and concerned with understanding the child" (Colvin, 1962; Kinter & Otto, 1964 cited in Kadushin, 1988, p. 368), if parents balance permissiveness with control (Paulson, Grossman, & Shapiro, 1974, cited in Kadushin, 1988, p. 355), and if homes are supportive of child relationships with birth parents (Shapiro, 1976, cited in Kadushin, 1988, p. 355). Another instrument focuses on the foster parent's need to be able to cope with "common problems" of the child promptly and appropriately (Cautley, 1980), and without the use of harsh punishment (Cautley & Aldridge, 1975). It also suggests that a parent should have an understanding of child rearing tasks, cooperate with the child-welfare agency, be flexible, and value the child's needs over his or her own (Kadushin, 1988, p. 369). In addition, foster parents should be generally accepting of a child's behaviors and tolerant of his or her failings (Rowe, 1976).

Additional elements suggested to be important in the literature (though not connected to particular assessment tool) are whether foster parents have a strong social support network (Strozier, 2012), are informed by outside professional parties, including mental health professionals (Romanelli et al., 2009), have a high degree of psychological and behavioral control (Barber, Stolz, Olsen, 2005, cited in Harden, Meisch, Vick, & Pandohie-Johnson, 2008) and are nurturing, warm, accepting, and affectionate (Magnus et al, 1999; Masten & Coatsworth, 1998, cited in Harden et al., 2008).

Interest in the development of instruments for identifying potential foster parents is high, though recent surveys suggest that existing scales (such as the Touhatos and Londholm's 1977 scale and Cautley and Lichtenstein's 1974 scale cited in Kadushin, 1988) have not been adequately used. The impact of this heterogeneous approach to certification on national child welfare outcomes is unclear. What is clear is that certifying homes for foster care is (a) critically important to be done carefully and (b) is very laborious. A primary concern with the certification process is that children are often placed expeditiously in any available home (Fanshel & Grundy, 1971 cited in Kadushin, 1988) without fully understanding the make up or quality level of the certified home.

Two current, more global, assessment tools are available and could potentially be used to assist in determining the adequacy of foster parents and homes. The first is the "The Casey Foster Applicant Inventory," developed by Orme, Cuddeback, Buehler, Cox and LeProhn (2007). This scale was developed based on existing literature related to parenting, practice and policy and was done with the aid of focus groups of parents, practitioners and children (Orme, et. Al 2007). Twelve domains can be assessed with the tool:

- Providing children with a safe and secure home environment
- Providing children with a nurturing environment
- Promoting children's educational attainment and success
- Meeting children's physical and emotional health needs
- Promoting children's social and emotional development
- Supporting children's cultural needs

- Supporting permanency planning by connecting children to safe, nurturing relationships intended to last a lifetime
- Managing ambiguity and loss for the foster child and foster family
- Growing as a foster parent by pursuing training, developing needed skills, and managing the complexities of the fostering role
- Managing the demands of fostering on personal and familial well-being
- Supporting relationships between foster children and their birth families
- Working in partnership with other members of the foster care team

The second was developed by Harden, Meisch, Vick, and Pandohie-Johnson (2008) to assess the attitudes that impact the efforts of foster parents. The Foster Parent Attitudes Questionnaire identifies six salient areas important to creating a quality foster home environment. These areas are: (a) motivation and commitment, (b) attitudes towards problems of the child, (c) attitudes toward biological parents, (d) kinship care, (e) experience as a foster parent, and (f) ambiguity in the role of the agency and the foster parent.

The domains assessed in these two instruments address the breadth of federal and state governmental requirements for certification. Implementing one or both of these tool (in the absence of a nationally developed standard) would benefit child welfare agencies by providing consistency and reliability across states. Furthermore, the use of a standardized instrument may enhance child welfare workers' ability to identify components of foster home environments in need of improvement and provide a more reliable way to monitor progress when foster parents are required to make needed changes.

Ongoing Assurance of Policy Compliance

After certification criteria have been met, foster parents are able to begin caring for foster children but remain under the supervision of the state agency. States are required to outline an ongoing monitoring process as a continual quality control mechanism. There are two primary vehicles through which this is accomplished. The first is through regular trainings. Each state specifies the types of trainings that are required and the annual hourly requirements for continued training; hours range from 0 (in Hawaii, U.S. Virgin Islands, Rhode Island, Virginia and Wisconsin) to 20 (in Colorado, New Jersey and Texas; National Resource Center for Family-Centered Practice and Permanency Planning, 2007). Many states use either the MAPP/GPS (Massachusetts Approach to Partnerships in Parenting/Group Preparation and Selection) or the PRIDE (Parents' Resources for Information Development Education) training as curriculum. These trainings are designed to cover 25 areas (outlined in Table 1.4) deemed critical for positive caregiving.

The second method of quality control is via ongoing, intermittent physical observations. Decades ago, Kadushin (1988) noted that proper child welfare practice would necessarily include the caseworker making regular visits to the

Table 1.4 Ongoing Quality Assurance

Training topics covered in PRIDE or MAPP/GPS (Grimm, 2003)

- Strengths and needs of children and their families who require foster care
- The critical nature and impact of separation and loss for all parties involved
- The laws, regulations, policies and values that direct the agency's CW programs
- The role of foster parents as effective and essential members of the foster care team and how the team operates within the agency
- Policies on discipline, confidentiality, substance abuse, and HIV/AIDS precautions, policies on psychotropic medication, and emergency procedures
- The importance of developing cultural competency
- The impact of fostering on foster parents, their children, and all aspects of their family life

Ongoing training to include the following per CWLA

- Helping children develop self-esteem
- Promoting cultural identity
- Responding to signs and symptoms of physical and sexual abuse, neglect and emotional maltreatment
- Helping children to learn appropriate behaviors
- Supporting children's contacts with their parents, siblings and kin
- Helping children with family reunification, adoption, and preparation for young adult life
- Understanding and managing the effects of chemical dependency
- Working as a team member
- Ways of approaching the sexual development needs of children and young people whose histories include sexual abuse and or exploitation
- Information on child management and supervision practices
- Resources and supports for fostering children

Ongoing training to include the following per COA

- Caregiver's rights and responsibilities and their partnership role with the organization in providing care and protection to the child, and support and service to the biological family
- The individual needs of children placed in their homes, including the needs of abused and neglected children and the importance of the cultural and ethnic contexts for service
- Sensitive and responsive practices to use with biological parents
- How to access governmental payments on behalf of foster children, including Medicaid cards, social security, and other public assistance
- Techniques for de-escalating conflict
- Management of aggressive or out-of-control behavior

home. Visits would involve interviewing the child and foster parents (as well as the birth parents) in order to understand how the placement is going.

In Oregon, the duty to monitor compliance falls on the shoulders of a certifier. In most cases, the certifier is required to visit foster homes every six months at a minimum; in cases where exceptions are made (such as a home with an excessive number of children living therein), visit intervals are reduced to three months. These visits are designed to assess whether certification standards have been maintained and ascertain whether any changes to the home environment are needed (e.g., physical environmental deficiencies). Visits may result in subsequent actions such as conducting background checks on new adults living in the home or requests made to the parents to come into compliance with policy expectations. In addition to the home visits, certifiers are required to seek input from the child's caseworker to evaluate conditions from the perspective of the child (OAR 413-200-0283 (2d)).

Aside from overseeing that foster homes are safe, monitoring also provides an opportunity to determine needs and provide support to foster parents. This effort is intended to increase the capacity of foster parents to support their foster youth as well as strengthen their resolve to persist through challenges. Retention of foster parents is one of the primary challenges for child welfare. In fact, many of the applicants who successfully navigate the certification requirements abandon their role after a relatively brief period. Reasons for this phenomenon have been suggested as dissatisfaction with (a) agency interactions, (b) agency policies and practices, and (c) the level of services provided (Rhodes, Orme, & Buehler, 2001).

Critique of the Monitoring Process

From a child welfare policy and practice perspective, at least two primary deficiencies exist in the monitoring process. First, it can be argued that foster parent

monitoring is overly reductionistic and reliant on the judgment and expertise of a single certifier (albeit under the direction of his/her supervisor). There is a dearth of empirical literature with respect to how closely policies for monitoring are followed. Therefore, it is unclear how effectively the process functions to accomplishing the intended outcomes. Semi-annual visits may not provide enough exposure to the typical patterns of daily living to effectively determine whether the foster home is meeting standards of quality or to identify areas in need of improvement.

A second consideration is that a monitoring certifier may be the same individual that conducted the home study. While the familiarity with the foster home may expedite the process of monitoring and re-certifying the home, that same familiarity may result in biased treatment. The certifier may feel invested in retaining a foster home's certification status and consequently ignore deficiencies that an independent assessor may notice.

With respect to understanding the effectiveness of monitoring policies, agencies collect limited data that could clearly answering related questions. Generally, data collected are limited to demographic information and audit-related concerns. Data collection required from each state are: "demographic characteristics of adoptive and foster children and their biological and adoptive or foster parents, the status of the foster care population…the number and characteristics of children placed in or removed from foster care…the extent and nature of assistance provided by federal, state, and local adoption and foster care programs and the characteristics of the children with respect to whom such assistance is provided" (42 U.S.C. 679 (c)(3)).

Federal oversight consists of state audits of these data approximately every three years. Audits are intended to oversee states' goals related to the total number of foster

children provided for in each state (42 U.S.C. 622 (b)(8). Resulting analyses are subsequently limited to reporting intermittent descriptive statistics which primarily track trends and changes and ignore correlating findings with policy or practice. The monitoring system, including data collection requirements, suffers from the same lack of granularity as the certification process. The current efforts are useful as a mechanism of accountability but do little to build our understanding of foster home quality or the impact that policy has on improving foster homes.

Connecting the Foster Home Environment with Mental Health Outcomes

A small but growing body of research exists with its focus on the relationship between critical elements of foster home environments and specific, child-level outcomes. Much less is known regarding the collective impact of a clustered set of those critical characteristics. Empirical studies have generally tested the impact of individual home characteristics on mental health in a piecemeal fashion rather than as a constellation that more accurately typifies a foster home. Notwithstanding the work of Orme and colleagues, the challenge to understand the foster home as a whole, rather than as a sum of its parts, remains to be accomplished. Part of the challenge is how to connect the many foster home characteristics and arrive at a comprehensive definition of high quality. This limitation has been a challenge for decades. In fact, Cautley and colleagues made a similar statement in 1966 stating that "one of the basic problems [in determining a successful foster placement] …is the absence of a fully satisfactory criterion measure" (p. 3).

Presentation of Research Questions

In response to this challenge, this investigation sought to expand our ability to identify the foster home in a holistic sense and to explore how types of foster homes related to the mental health of the children they house. The focus was narrowed to a study of specific elements of the foster home environment that were explicitly related to mental health outcomes of foster youth. Two general sequential steps were required to carry out the study. The first involved a review of the theoretical and empirical literature to identify elements of the foster home environment shown to be related to the mental health of foster children. The literature review informed the development of a theoretical model of variable indicative of foster home quality. The second step comprised an exploration of secondary data from a sample of Oregon foster youth. A second theoretical model was developed that resembled the first but that was reduced to include only variables available in the dataset. Cluster analyses were conducted to separate types of foster homes based on the second theoretical model. Finally, types of foster homes were compared to understand their relative impact on mental health outcomes.

The following specific research questions were addressed through the course of the study:

- *Research Question 1:* Can foster home environments be classified or categorized in such a way that distinguishes one type of foster home from another?
- *Research Question 2:* How many clusters or classes of foster homes can be identified given the measured variables in the dataset?

- *Research Question 3:* What variables are most indicative of each class or cluster of foster home?
- *Research Question 4:* Are there differences in baseline mean scores of outcome variables based on membership in a particular class or cluster of foster homes?
- *Research Question 5:* How does the predicted membership in a particular class of foster home contribute to the stability of mental health outcomes of an adolescent in foster care over a period of 18 months?

Answering these questions contributes to filling the gap in empirical literature related to (a) our understanding of what quality foster homes are composed of and (b) how foster home quality contributes to the mental health of the youth living therein. By enhancing this understanding, more precise attention can be paid by certifiers and trainers to elements of the foster home that are most powerful. Most importantly, furthering our understanding in this area can shape policy and practice by (a) placing the most vulnerable children in the most effective foster homes and (b) allowing for more precision in providing support to homes that are lacking in order to increase their effectiveness. Consequently, children placed in well understood foster homes will have a better chance of improved outcomes in both the short and long term.

Chapter 2: Theoretical Framework and Literature Review

Several explanatory theories exist that support the link between foster home environments and child outcomes. More broadly, multiple theories support the link between contextual influences in a child's life and his or her development. Among these theories are General Systems Theory (von Bertalanffy, 1968; Friedman & Allen, 1997), Bioecological theory (Bronfenbrenner, 1977; Bronfenbrenner, 1986), Family Systems theory (Minuchin, 1974), and the theory of Triadic Influence (Flay, Petraitis, & Hu, 1995). Each of these theories provides a framework that supports the need to consider the impact of different levels of environmental factors on outcomes of individuals living within their influence. However, none of the above mentioned theories provide a comprehensive treatment that can identify how contextual influence might be modeled in quantitative analyses.

The Holistic-Interactionist theory discussed by Bergman, Magnusson, and El-Khouri (2003) is one that is both directive in the explanation of outcomes as a product of a larger contextual situation as well as in the selection of analytical methods that focus on a person-oriented, rather than a variable-oriented, approach. Citing earlier works by Bergman and Magnusson (see Magnusson 1999 for historical perspective on the Holistic-Interactionistic perspective), the theory posits that (a) "individuals function and develop as integrated organisms" and (b) an individual develops "as an active participant in an integrated person-environment system of higher order." In essence, the theory suggests that an individual's well-being is the product of his or her unique and specific components (attitudes, behavioral choices, perception of experiences, etc.) *and* the

interaction of those parts with each other (i.e., the general attitude/demeanor of a person impacts the perception of lived experiences and relates to experienced emotions).

In principle, the focus of the Holistic-Interactionistic theory on individual entities could be extended from individuals to include micro systems, and specifically the foster home, as a viable unit of analysis. Much like an organism, a foster home is characterized by multiple components that operate individually as well as collaboratively resulting in a unique foster home identity. An example of this interactive process was demonstrated in a Lindhiem and Dozier (2007) study that found that foster youths' behaviors contributed to the attitudes and commitment of the foster parents, which in turn impacted the quality of caregiving. Research has focused on individual components (such as foster youth behavior and commitment) but has failed to study them as a collective set of interrelated parts. In the same way that a person's physical well-being is understood as a construct that includes the muscular, skeletal, and neural systems, an environment's essential components should work in concert to create a high functioning, effective system.

As a unit of study, the foster home is an integrated entity uniquely impacted by external forces distinct from non-foster homes (e.g., child welfare policy and practice). These external forces interact with unique, home-level components that affect the welfare of the home as a whole (e.g., willingness to adhere to policy guidelines, attitudes towards case worker involvement). Kagan (2000) described the need for a synthesis of knowledge of different aspects of development "in order to overcome fragmentation of research"—this argument can similarly be made of research on foster homes.

The fact that an overarching foster home quality assessment tool has not been developed or adopted on a national scale speaks to the complexity of understanding the home environment as a whole. Current foster care research has not embraced the need for synthesis and remains fragmented, as evidenced by the numerous studies focused on particular elements of the foster home rather than their combined, interactive effect. Nevertheless, the body of research on individual foster home elements is substantial and provides a sufficient foundation from which to build a more holistic understanding.

This study has relevance to social work research, policy and practice by expanding the way in which foster homes are understood holistically and in terms of the interactions of their parts. Analyses of this nature will contribute to a more comprehensive understanding of the types of foster homes in operation (examined as multi-faceted environments). Consequently, an expanded understanding of what makes foster homes effective has the power to improve the impact that these temporary environments have on the mental health of foster children. Furthermore, if a typology can be constructed, including key indicators of particular foster home types, then the development of an assessment tool to identify foster home types may also be possible.

Literature Review Process

To understand what key elements of the foster home environment are associated with the mental health of foster children have been empirically explored, a literature review that identified one or more components of the foster home as a predictor of child mental health was conducted. For the purpose of consistency across studies, elements of foster home environments were identified in terms of the measurement instrument or

item(s) used as independent variables rather than the label given to the construct by the author.

In some cases, statistically significant relationships were found between a child-level outcome and a seemingly powerful and important environmental construct, only to be diminished by the way in which the construct was measured (e.g., Tarren-Sweeney, 2008). In such cases, the importance of the construct seemed to be more of an element of the construct's author-given moniker than a true reflection of a substantive environmental characteristic. As a result, it seemed less useful to categorize findings by the construct identified by the author in favor of categorizing them based on the instrument or items used to assess the indicated element(s).

The search was conducted using the Web of Science and PsychINFO databases with the following search terms: "Foster care" AND "home environment", "Foster care" AND "Quality" and "Foster child*" AND "Internal." Results were limited to a 20-year time period. All abstracts were reviewed by the author with an eye on identifying empirical studies that utilized a sample of foster children in regular foster care (as compared with treatment or specialized foster care) and included an element of the home environment as a predictor of foster child mental health. From the initial search, instruments used to measure elements of foster home environments were identified and then used as search terms in both the Web of Science and ProQuest databases. Those results were then reviewed with studies that connected the instrument to a mental health outcome identified in the findings. Additionally, a few select literature reviews were included if they reported on studies that predated the criteria of the search and were found useful in answering the research questions.

Literature Review Results - Scales as Indicators - Significant Findings

A substantial body of literature exists regarding foster homes. However, relatively few studies were found that directly connected an element of the foster home environment with a measure of foster youth mental health. Several measures were found, some of which were standardized instruments with substantial psychometric properties reported; others included instruments that had been developed by the authors for the purpose of the study. Furthermore, the extent to which instruments were used varied significantly from study to study, ranging from the use of an instrument in its entirety, to selecting only a particular subscale or even using a single item as an independent variable. Instruments that were used (either in their entirety or with a particular subscale) are presented in order from most to least frequently found. Studies that used only an individual item as a predictor are mentioned following the scales. The results of the findings are included in the same order in Table 2.1.

Five standardized scales used to measure one or more elements of the environment that predicted mental health outcomes were found. Several studies were also found that indicated a relationship between a single item that measured some characteristic of either a foster parent or their home in conjunction with mental health. The Home Observation for Measuring Environments (HOME) was the most prominent instrument used and was included in five studies. The Family Resource Scale was used in two studies, the Family Support Scale was used in one study as were the Cultural Match scale and the birth family visitations construct. Listed below are details of the instruments followed by a review of the studies in which they were used.

Home Observation for Measuring Environments

In many ways, the Home Observation for Measuring Environments (HOME) is the empirical standard for measuring environmental quality. This is due in part to its numerous subscales that allow researchers to assess a number of granular characteristics as well use the scale in its entirety as an overall indication of quality. Furthermore, there is a relative lack of comparable alternative standardized measures that capture such a breadth of environmental elements. It is worth mentioning that the HOME is included in the National Survey of Child and Adolescent Well-Being (NSCAW), a national, longitudinal survey that evaluates children who have been referred for child welfare services on a host of variables measured by a variety of measurement instruments.

The HOME has its roots in Bloom's (1964) theories of stability and change in human characteristics. Based on Bloom's theories, a measurement instrument was developed in response to the lack of instruments suitable to measure the quality and quantity of characteristics that were determined to be most salient to the development of infants and young children (Elardo, Bradley, & Caldwell, 1975). The original inventory was based on a list developed by Caldwell (1968, as cited in Elardo et al., 1975) and consisted of six subscales that measured (a) emotional and verbal responsivity of the mother, (b) avoidance of restriction and punishment, (c) organization of the physical and temporal environment, (d) provision of appropriate play materials, (e) maternal involvement with the child, and (f) opportunities for variety in daily stimulation (Elardo et al., 1975). They found that certain cognitive functions such as verbal and numeric abilities were predicted by their inventory. The HOME was further developed by Caldwell, Heider, and Kaplan shortly thereafter (Bradley & Caldwell, 1976). In 1984,

Bradley and Caldwell published a report to address concerns that had been raised about the instrument's focus on objects in the home. This was seen as a bias towards rewarding the more affluent homes as higher quality environments (Bradley & Caldwell, 1984), a finding that was partially observed in the report and more fully supported in an international study decades later (Bradley & Corwyn, 2005). In 2003, the HOME was further updated in the way of scales developed to be used in childcare settings, with children under the age of three and children between three and six (Bradley, Caldwell, & Corwyn, 2003). The most current HOME measure includes four versions: the Infant-Toddler version (containing six subscales), the Early-Childhood version (containing eight subscales), the Middle Childhood version (containing seven subscales) and the Early Adolescent version (containing seven subscales) (Bradley & Corwyn, 2005). In the current manual, the authors indicate that they have allowed their instruments to be adapted freely to various situations. They also mention that the HOME is not highly discerning in terms of identifying those homes that are superior from those homes that are merely adequate.

A dedicated bibliographic web page has been established to identify the scope of the HOME and contains over 1,000 citations wherein the HOME has been used as part of a study (Arizona State University, 2022). A search filter of "foster" was entered into the webpage and resulted in 32 separate citations including foster families or children. Despite the HOME's ubiquity in research on home environments, there were few studies that included the mental health of foster children as an outcome. Of the 32 citations, five studies were found that included foster youth mental health as an outcome.

In a study of 230 children living in the care of a grandparent (only 6.8% of which were formally in foster care), total HOME scores were found to be associated with internalizing (ß=-.165, p<.05) and externalizing (ß= -.152, p<.05) behaviors on the CBCL above and beyond effects of any covariates (Kelley, Whitley, & Campos, 2011). A smaller study of 38 children and their foster parents was conducted using the HOME (among others) as a predictor of CBCL scores and found significant zero-order correlations with the externalizing (r=-.32, p<.05) and internalizing (r=-.54, p<.01) scales of the CBCL. Though the association with internalizing scores did not hold when covariates were entered, externalizing scores remained significant after controlling for other variables (ß=-.48, p<.01) (Smith, 1994)

Subscales of the HOME, including organization and proper learning materials, were predictive of secure attachment among infants in foster care in Cole's reports (2005; 2006). In at least one study, the HOME was used as an outcome variable and found to be associated with whether a child's caregiver was also his or her grandparent; this study further suggested that HOME scores may have a moderating effect. Specifically, HOME-SF (short form) scores were higher among grandparent/kinship foster homes as compared to non-kin homes. In the same study, HOME-SF scores were higher in those homes with (a) a caregiver who had more than a high school education and (b) in homes with very young children (two years old or younger) (Dolan, Casanueva, Smith, & Bradley, 2009).

Brief Symptoms Inventory

The Brief Symptoms Inventory is a frequently used inventory designed to assess symptoms of nine separate categories (Somatization, Obsessive-Compulsive,

Interpersonal Sensitivity, Depression, Anxiety, Hostility, Phobic Anxiety, Paranoid Ideation, and Psychoticism). It also contains three global indices: the Global Severity Index (GSI), which assesses the overall level of stress; Positive Symptoms Distress Index, which assesses the intensity of symptoms; and the Positive Symptoms Total, which is a report of the total number of symptoms (www.pearsonclinical.com/psychology/products/100000450/brief-symptom-inventory-bsi; Derogatis & Melisaratos, 1983, cited in Minnes et al, 2010).

In 2010, Minnes et al. conducted a longitudinal study of children with and without gestational cocaine exposure. A subset of foster children was assessed when they were six years old and included a measure of the current caregiver's global severity index in association with all subscales of the CBCL and found statistically significant relationships. Specifically, children's risk for somatization (OR=2.70, p<.01), social problems (OR=2.05, p<.01), thought problems (OR=2.74, p<.01), attention problems (OR=2.12, p<.01), delinquency (OR=1.83, p<.01), aggression (OR=2.58, p<.01), internalizing (OR=2.74, p<.01), externalizing (OR=2.05, p<.01) and total behavior problems (OR=2.97, p<.01). The study included foster youth in the sample but did not distinguish them from non-foster youth in the analyses with the GSI. They compared the foster youth on CBCL outcomes with non-foster youth and found significantly greater risk of endorsing a score above the clinically significant cutoff in 7 of 9 CBCL subscales including internalizing (OR=4.87, p<.01), externalizing (OR=8.80, p<.01) and total behavior problems (OR=9.70, p<.01, Minnes et al., 2010).

In two additional studies, the scale was found to be positively associated with internalizing symptoms (ß=.26, p<.05) (Linares, Rhodes, & Montalto, 2010) and

correlated with both internalizing (ß=.43, p<.01) and externalizing (ß=.42, p<.01) of the CBCL above and beyond covariates including the HOME scale (Kelley, Whitely and Campos, 2011).

This is My Baby Interview

The This is My Baby interview (TIMB) was created by Bates and Dozier in 1998 (cited in Bernard & Dozier, 2011) and is an instrument that assesses caregiver commitment, acceptance, and belief in influence. It consists of eight open-ended questions that ask the foster parent to consider their own feelings about the child, their role in continuing to care for the child, and their perceived impact of their relationship on the child (Bernard & Dozier, 2011). Interviews are coded following an established manual on a 5-point scale of commitment ranging from low to high. An example of the coding rubric suggests that "high commitment" is manifested if:

> "The caregiver provides evidence of a strong emotional investment in the child and in parenting the child; multiple indices of high levels of commitment are present throughout the interview; descriptions of the child and the caregiver–child affective bond; there may be evidence of the caregiver committing resources to promote the child's growth, or other indices of psychological adoption of the child; the child is fully integrated into the family; although the caregiver may acknowledge that the child will eventually leave her home (e.g., to return to the biological parent), she considers the child as hers while the child is in her home" (Bernard & Dozier, 2011, p. 10)

In a study of foster parents and their foster children (ages 0-5), 76 parent-child dyads were assessed using the TIMB (coded on a 17-point scale from 1.0 to 5.0 in .25-point increments) and the CBCL. They found an inverse association between externalizing behaviors and higher TIMB score (ß=-.38, p<.05). The findings were cross-sectional, however, and did not hold over time. The study assessed participants at

two time points, approximately 10 months apart, and found no significant association between Time 1 TIMB scores and Time 2 CBCL scores (Lindhiem & Dozier, 2007). Other associations of the TIMB measure included foster parents' experiences of delight in their foster child (ß=.44, p<.01, Bernard & Dozier, 2011). In another study, the acceptance scale of the TIMB was found to be significantly associated with children's self-appraisal (based on the Cassidy, 1988 Puppet Interview; *partial r*(39)=.40, p<.01) (as noted in Ackerman & Dozier, 2005).

Family Resource Scale

The Family Resource Scale (FRS) was developed to measure resources in the homes of families with young children. There are 31 items on the scale that are rated in terms of adequacy from 1= "not at all adequate" to 5= "almost always adequate." The scale is based on a conceptual framework by Dunst and Leet (1987) that associates inadequacy of resources to reduced well-being and less commitment of parents to fulfill role expectations. In a validation study with 45 mothers with young children with disabilities, the scale was found to have good internal reliability (alpha=.92). A principal components factor analysis yielded 8 factors comprising (a) growth and financial support, (b) health and necessities, (c) primary nutrition and communication, (d) physical shelter, (e) intrafamilial support, (f) communication and employment, (g) childcare, and (h) independent source of income. Validation studies suggest that the FRS was correlated with personal well-being and maternal commitment to carry out child-level interventions (Dunst, 1988).

Kelley, Whitley and Campos (2011) found that the scores on the Family Resource Scale were inversely correlated with both externalizing (*r*=-.23, p<.01) and internalizing

(*r*=-.25, p<.01) scales of the CBCL at the bivariate but not the multivariate level with included covariates (notably, the HOME, Psychological distress, and number of children). A longitudinal study of 143 African American children living in informal kinship care included the FRS as an indicator variable and found that improved family resources were positively linked to improved competency as indicated by the CBCL (ß=2.29, p<.01; Washington, Gleeson, & Rulison, 2013). The study also found that competency was predicted by change in the FRS (ibid).

Parenting Practices Inventory

The Parenting Practices Inventory was adapted from a questionnaire developed as an interview guide by the Oregon Social Learning Center. It examines seven areas of parenting styles: (a) appropriate discipline, (b) harsh and inconsistent discipline, (c) positive verbal discipline, (d) monitoring, (e) physical punishment, (f) praise and incentives, and (g) clear expectations. Alpha coefficients for the scales ranged from .54 to .82 (Webster-Stratton, Reid, & Hammond, 2004; Duppong Hurley et al., 2012).

The Harsh Discipline subscale of the parenting practices inventory was associated with increased levels of externalizing symptoms on the CBCL (ß=.26, p<.05, Linares, Rhodes, & Montalto, 2010). In a study of 48 families involved in child welfare services with children at risk for being removed, the PPI was inversely correlated with total CBCL scores (*r*=-.*36,* p<.05); yet it was not significantly associated at the multivariate level when other measures of parenting capabilities were entered into the model (Duppong Hurley et al., 2012).

Cultural Match

Anderson and Linares (2012) developed the Cultural Match scale for a study that assessed a group of 106 foster children living in 62 homes in New York City. They measured cultural match based on five criteria: (a) match in self-reported ethnicity (a categorical measure with seven options) between the foster child and foster parent; (b) match between the bio-parent and foster parent; (c) match in country of birth of the foster parent and bio-parent; (d) match in the language spoken by the child and foster parent; and (e) match in language spoken by the bio-parent and foster parent. They created a total cultural match score ranging from 0-5 depending on dissimilarities reported. They then assessed the association of cultural dissimilarity with depression, loneliness, and conduct problems and found that dissimilar ethnicities between foster and bio parent were associated with child depression ($B=-5.5$, $p<.01$) and loneliness ($B=-10.38$, $p<.05$) and that dissimilar languages between bio and foster parents predicted conduct problems ($B=-32.17$, $p<.05$).

Parental Warmth and Acceptance Scale

The parental warmth and acceptance scale was developed for and piloted in a study of family relationships and depression among adolescents (Greenberger & Chen, 1996). The scale is composed of 13 6-point Likert-type items. Alphas ranged from .86 to .92. Example items of the parental warmth and acceptance scale include "My mother (father) likes me the way that I am" and "my father (mother) really understands me." The scale was positively correlated with a cohesion subscale of the Family Environment Scale (Moos & Moos, 1986, cited in Greenberger & Chen, 1996). In multiple studies, it was found to be positively associated with mental health constructs

including the Rosenberg Self-esteem scale (Rosenberg, 1965), a Center for Epidemiological Studies-Depression scale (Radloff, 1977) and the Greenberger, Chen, Beam, Whang & Dong (2000) parental warmth scores (B=.08, p<.01, Farruggia, Greenberger, Chen, & Heckhausen, 2006).

The Co-Parenting Practices Scale

The Co-Parenting Practices Scale was developed by Linares, Rhodes, and Montalto (2005) from available co-parenting and family scales to assess elements of co-parenting in foster families. The scale was made up of 30 items with three embedded subscales that measure (a) support/flexibility, (b) shared communications, and (c) conflict/triangulation with an alpha of .92 (Linares, Rhodes, & Montalto, 2010). The scale was used in a study of 80 foster parents who had children from ages five to eight years old. They found that the conflict/triangulation subscale was positively related to both internalizing (ß=.32, p<.05) and externalizing (ß=.34, p<.01) subscales of the CBCL (Linares, Rhodes, & Montalto, 2010).

Sibling Relationship

A sibling relationship strength scale was created with a sum score of two questions ("compared to others, how well do you get along with your sibling?" and "how often do you see…your sibling?) from the UC Berkeley Foster Care Study for Children in Out of Home Care. The two-item scale had an alpha of .75 (Wojciak, McWey, & Helfrich, 2013). Authors found that internalizing symptoms (as reported on the CBCL) related to trauma (as reported on the Trauma Symptoms Checklist for Children) were significantly mediated by the perceived strength of relationship with the child's sibling.

Non-Significant Findings

Family Support Scale

The Family Supports Scale (FSS) is an 18-item measure that is intended to assess the degree to which different resources are found to be helpful in the lives of a family. Each item is scaled from 1-5 (ranging from "Not at all helpful" to "Extremely helpful") and the total scale had adequate internal reliability (alpha= .77). Developers found six scales embedded in the 18 items using principal components factor analysis. These scales were: (a) informal kinship scale, which assesses helpfulness from individuals who are not specifically kin but have familial connections, (b) social organizations scale, (c) formal kinship, these are closer family members than the informal kinship scale, (d) immediate family scale (i.e. spouse or partner, parents), (e) specialized professional services, and (f) generic professional services. The instrument asks "how helpful have… each of the following [supports] been…in terms of raising…children" and then lists 18 different types of people such as spouse/partner's parents, friends, my own children, etc. (Dunst, 1988). Kelley, Whitley, and Campos (2011) included the FSS as a predictor of internalizing and externalizing behaviors on the CBCL but found no significant relationship between the scales.

Support from Parents Scale

The Support from Parents Scale was developed for the Farruggia, Greenberger, Chen, and Heckhausen (2006) study and is composed of seven items that ask the degree (on a 4-point scale of frequency) to which youth report having received support from their parent(s) during the previous six months. It included questions regarding providing transportation and giving support for family problems. The scale had a high internal

consistency (alpha=.92, Farruggia, Greenberger, Chen, & Heckhausen, 2006). In the study of 163 foster youth, scores on the perceived parental support scale were not significantly associated with scores on mental health outcomes (which was not clearly detailed but appears to include the Rosenberg Self-esteem scale and Center for Epidemiologic Studies-Depression scale.)

Birth Family Visitations

Family visitation or contact with biological family members is a construct that reflects the degree to which foster parents are able to facilitate contact with birth parents. Delfabbro, Barber, and Cooper (2002) measured this construct with three individual items: (a) the caseworkers' recorded rate of the frequency of family visits (six-point scale from never to daily); (b) the type of visits (indirect/telephone, direct/in person, overnight); and (c) the quality (not beneficial, somewhat beneficial or very beneficial) of the visits for evaluation in a study of 235 Australian foster youth (Delfabbro, Barber, & Cooper, 2002). They found that change scores of psychological adjustment (measured with items from Boyle et al.'s 1987 child behavior checklist including six items related to conduct disorder, three related to hyperactivity and five related to anxiety and affect) across two time points (spanning eight months) were not significantly related to changes in frequency of contact. They did find an association between being "better adjusted" and the frequency of family visits (Delfabbro, Barber, & Cooper, 2002, p. 37).

Single Item Indicators - Significant Findings

Additional studies looked at relevant environmental influences on foster youth mental health but used only a single item as an indicator. In some instances, the use of a single-item indicator is a standard if not a preferred choice, such as in the case of

demographic information. However, in other instances, the use of a single item limits measuring any subtleties or nuances of an underlying construct. Nevertheless, the indicators have been included here as they are informative in identifying the theoretical model that guides subsequent analyses.

Kinship Care

Kinship care was assessed by examining the type of relationship between the foster child and the caregiver. Specifics such as grandparent, aunt/uncle, and origin of relationship (maternal/paternal) are included in some of the demographic questions of studies. Specifically, living with kin has been shown to be associated with improved mental health in several studies (though not unanimously). For example, in a study of 214 Norwegian foster children, a number of CBCL scale scores (Total Problems, Social Problems, Attention Problems and Delinquent Behavior) were found to be significantly lower among those living in kinship care (Holtan, Rønning, Handegård, & Sourander, 2005). In addition, the authors found that children in non-kinship homes were at a marginally increased risk (OR = 1.8, CI(0.9-3.7)) for a CBCL total score in the borderline or clinical range (Holtan, Rønning, Handegård, & Sourander, 2005).

Hegar and Rosenthal (2011) analyzed NSCAW data on a representative national sample of approximately 1,142 youth in foster care (*n* ranged from 795-1,696 depending on outcome variable), 39% of whom lived in kinship care. They found a significant relationship between living in kinship care and lower scores on both internalizing (B=-3.28, $p<.01$) and externalizing (B=-2.56, $p<.05$) CBCL scales as reported by the foster parent. In contrast, teacher-reported scales indicated a significant positive relationship with living in kinship care for both internalizing (B=4.99, $p<.05$) and externalizing

(B=8.95, p<.01) scales of the Teacher's Report Form (TRF). The association was non-significant with youth-reported Achenbach scales in the same study.

In a study conducted by Garcia et al. (2014), authors found that children placed in kinship homes had a higher likelihood of improved mental health in terms of CBCL scores over a two-year time period after recent placement than children who were placed in non-kinship foster homes. In another study, youth in kinship homes had significantly higher scores on the CBCL delinquency scale (t=2.358, p<.05) but not on internalizing, externalizing, or total problems (Shore, Sim, Le Prohn, & Keller, 2002).

Living with Sibling

Hager and Rosenthal (2011) assessed the difference in scores between siblings that were placed together and those living separately. They found that being placed with a sibling was not significantly related to CBCL externalizing or internalizing scores reported by the parent or youth. They did find a significant interaction effect between living together and living in a kinship home and the CBCL subscales of externalizing and internalizing; specifically, siblings living together in kinship care fared better in terms of the TRF than siblings living without another sibling in kinship care (Hegar & Rosenthal, 2011). Similar findings supported positive effects of living with a sibling in a study of children living in residential care; in particular, those living with a sibling reported higher quality of life scores than those who did not (Davidson-Arad & Klein, 2011).

Caregiver Depression

Garcia and colleagues (2014) conducted a study of 405 newly placed foster children (199 of whom participated in follow-up interviews). They assessed caregiver depression by examining the difference between two time points of responses to one

question (measured on a five-point interval scale) from the SF-12 Health Survey. The authors categorized caregivers into four groups based on this item; caregivers who (a) were never depressed, (b) became depressed, (c) improved and (d) remained depressed. The authors then compared groups of foster children based on the type of caregiver with whom they lived and found that foster children with the poorest outcomes (in terms of CBCL total, internalizing, and externalizing scores) were those who lived with a non-relative caregiver who became depressed over the six-month assessment period. They found an average increase of 25.5 points in the CBCL total score among this subgroup (CI: -1.49, 53.48 $p<.10$). Children who saw the most improvement were those living with a relative foster parent whose depression status improved over the assessment period (reduced CBCL total score of 18.09 between the two-time points CI -31.21, -4.96, $p<.01$; Garcia et al., 2014)

Caregiver Health

In a study of 347 foster children in Australia, Tarren-Sweeney (2008) measured caregiver health with one open-ended question ("How is your health at present?") coded as either "poor health" or "adequate or good health." He found that Total CBCL scores at baseline were significantly related to the health of the caregiver. CBCL scores were higher (Cohen's $d=.65$, $p<.01$) among children who had a caregiver who reported poor health. He also found that children living in stranger care reported higher CBCL scores than children living in kinship care (Cohen's $d=.42$, $p<.01$; Tarren-Sweeney, 2008).

Geography of the Foster Home

Geographic location was measured by Holtan and colleagues (2005) by examining the location of the foster home with respect to the child's birth home. A child

was considered to be living in his or her home community if he/she lived in the same municipality as his/her birth home. The study was conducted in Norway, which at the time of data collection (2000) had 435 municipalities with an average size of 441 square miles (personal communication with the author). For perspective, Portland, OR is approximately 145 square miles in size.

In the Holtan, Rønning, Handegård, &Sourander (2005) study, a simple logistic regression suggested that total CBCL scores were more likely to be in the borderline or clinical range (O.R.=3.1, CI 1.7-5.6) among children living outside the community from which they were removed. When covariates (e.g., gender, kinship care, and number of other children in the home) were included, the odds ratio dropped to 2.6 (CI 1.3-5.0) but remained significant.

Parental Caring

The Minnesota Student Survey (MSS) is an assessment conducted every three years on students in the Minnesota public school systems. The survey examines the following areas: tobacco, alcohol and drug use, school climate, physical activity, violence and safety, connections with school and family, and health (among others). The survey is administered collaboratively by the Minnesota Departments of Education, Health, Human Services, and Public Safety ("Minnesota Student Survey - Center for Health Statistics," n.d.). In a secondary data analysis of 5,516 foster youth assessed with the MSS, Harpin and colleagues (2013) found that emotional distress (a construct based on five items that asked the degree to which a child felt nervous, sad, discouraged, stressed and how often he/she feels unhappy) was inversely related (ß=-.11, $p < .01$) to parental caring (measured with one item: "how much do you feel your parents care about you?" from "not at all" to

"very much"). The association was present after controlling for demographic information and abuse type (Harpin, Kenyon, Kools, Bearinger, & Ireland, 2013).

Family Functioning

Family functioning was measured with an item on the "Child and Adolescent Needs and Strengths for children and adolescents with mental health challenges" (CANS-MH) tool. The CANS-MH is a free, open-domain tool with high face validity and adequate reliability (alpha=.74-.85). It has been correlated with CAFAS, which is suggested to be an independent measure of burden that reliably (alpha=.91) assesses level of care needs consistent with expert clinical assessments. The CANS-MH is reported as an 'item-level' measure with individual items providing sufficient evidence for the need for intervention. Items are ranked on a three-point scale from "least severe" to "most severe" in need for immediate action or quality of a strength. Items reflect a 30-day period prior to completing the instrument, and ratings are made either after a review of a case file or after a clinical interview has been conducted. There are six domains of the CANS-MH (problem presentation, risk behaviors, functioning, child safety, family/caregiver needs and strength, and strengths; Lyons, 1999).

In a study of 228 youth in foster care who scored a two or three on the depression item of the CANS-MH instrument, researchers examined outcomes based on improved scores over a period of approximately six years. Using an exploratory analytic approach (optimal data analysis) and classification tree analysis, they determined that among several variables, family functioning was predictive of reduced depression scores (Stoner, Leon, & Fuller, 2013).

Literature Review Conclusion

To summarize the findings, in terms of scales, the HOME instrument (five studies), Brief Symptoms Inventory (three studies), This is My Baby Interview (three studies), the Family Resources Scale (two studies), Parenting Practices Inventory (two studies), Cultural Match (one study), Parental Warmth and Acceptance Scale (one study), The Co-Parenting Practices Scale (one study) and a two-item scale of Sibling Relationship (one study) were found to have significant associations with mental health constructs. The Family Support Scale, Support from Parents Scale and Visitation with Birth Family measure were all tested in single studies, none of which found a significant association with mental health measures.

As for individual items, three studies were found that related kinship care to mental health and one study that did not find a statistically significant relationship. Living with a sibling was associated significantly with quality of life in two studies; in contrast, another study found that living with a sibling was correlated with reduced TRF scores but not with any differences in CBCL scores. Individual studies found associations among CBCL scores and (a) depression (based on the SF-12 Health Survey), (b) caregiver health (based on the Children in Care Study), and (c) geographic location of the foster home respective of the birth home. Parental caring was found to be associated with reduced emotional distress in one study. Finally, one study suggested that lower child-reported depression was related to family functioning.

Theoretical Model

Based on this review, a theoretical model was proposed (see Figure 2.1) that presents foster home quality as a construct that embodies the wide range of

characteristics found in the literature. The model suggests that the overall quality of the foster home can be separated into categories that impact measured variables. The variables that have been included in the theoretical model are those. The following chapters of the thesis document and apply a theory-informed empirical methodology that explores (a) how foster homes differ in terms of their combined manifestations of quality-related elements and (b) how those differences impact foster youth mental health. These chapters outline the available data, the analytic process, and the findings and implications of the exploration

Figure 2.1 Theoretical Model Based on Current Literature

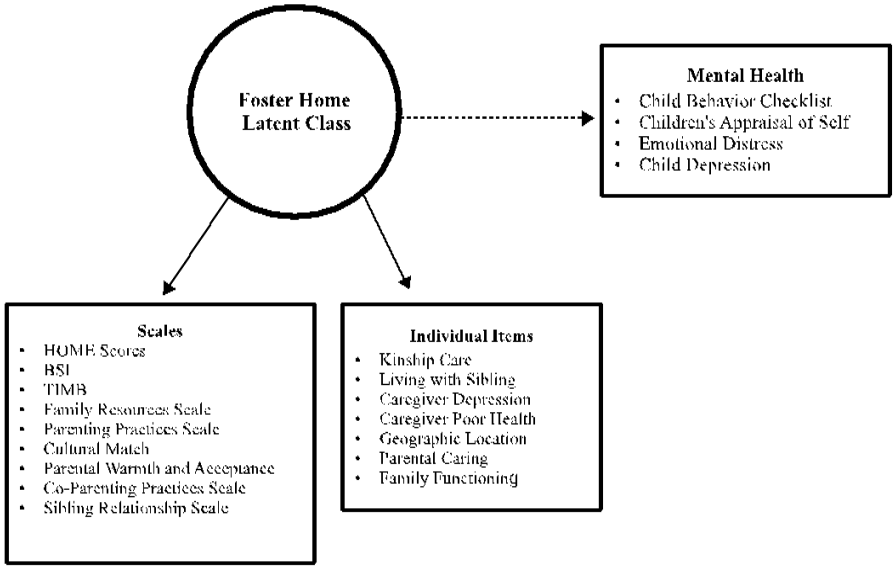


Table 2.1 Studies of Home Environment Elements Tested with Mental Health Outcomes
Multi-Item Scales

Construct	*Author*	*Scale/*=Item*	*Outcome*
Home Environment	Kelley, Whitely & Campos, 2011	Total HOME score	HOME scores were inversely related to CBCL Internalizing (ß=-.165) and Externalizing (ß= -.152) scales
	Smith, 1994	Total HOME Score	Total HOME scores were significantly correlated with CBCL Internalizing scores (*r*=-.54) and externalizing scores (*r*=-32). At the multivariate level, externalizing scores were significantly related to the HOME scale (ß=-.48)
Home Organization	Cole, 2005	HOME Organization subscale, Learning Materials subscale	HOME Subscales of Organization (OR=2.67) and Learning Materials (OR=4.58) are predictive of secure attachment.
Learning Materials	Cole, 2006	HOME Learning Materials subscale	Kin Caregivers scored higher on HOME Learning Materials subscale (t(44)=2.37), no other significant differences in HOME subscales
Kinship	Dolan, Casanueva, Smith & Bradley, 2009	Kinship care, HOME-SF	Kinship foster homes scored higher on the HOME-SF scale (*B*=.05). HOME-SF scores were associated with education in that lower education was associated with poorer HOME-SF scores (B=-.08).
Psychological distress of caregiver	Minnes et al., 2010	Brief-Symptoms Inventory, Global Severity Scale	BSI was associated with clinical levels of CBCL subscale scores; somatization (OR=2.74), social problems (OR=2.05), thought problems (OR=2.58), attention problems (OR=2.12), delinquency (OR=1.83), aggression (OR=2.58), Internalizing (OR=2.74), externalizing (OR=2.05), total problems (OR=2.97).
	Linares, Rhodes & Montalto, 2010	BSI	Psychological caregiver distress was associated with internalizing symptoms (ß=.26)

Table 2.1 Studies of Home Environment Elements Tested with Mental Health Outcomes-Cont'd

Multi-Item Scales

Construct	*Author*	*Scale/*=Item*	*Outcome*
Caregiver commitment	Lindhiem & Dozier, 2007	This is My Baby Interview, commitment	Total CBCL was negatively (ß=-.38) associated with time 1 TIMB score
Enjoyment in foster care giving	Bernard & Dozier, 2011	This is My Baby Interview, experiencing delight in their foster child	Commitment was positively associated with delight (ß=.44)
Acceptance	Ackerman & Dozier, 2005	This is My Baby Interview, acceptance scale	Child self appraisal was significantly associated with Caregiver acceptance (*partial r*=.4).
Family Resources	Kelley, Whitely & Campos, 2011	Family Resource Scale	Significant bivariate correlations with CBCL Scales (int: *r*=-.25; ext: *r*=-.23)
	Washington, Gleeson & Rulison, 2013	Family Resource Scale	Family resources were associated with CBCL competency scale(ß=2.29)
Parenting Skill	Linares et al., 2010	Parenting Practices Inventory, Harsh Discipline subscale	Harsh Discipline was related to increased externalizing, no E.S. reported
	Duppong Hurley et al., 2012	Parenting Practices Inventory	PPI was inversely related to total CBCL scores at the bivariate level (*r*=-.36), n.s. at the multivariate level
Cultural Match	Anderson & Linares, 2012	Cultural Match Scale	Cultural dissimilarities were associated with decreased mental health, no E.S. reported
Parental Warmth and Acceptance	Farruggia, Greenberger, Chen & Heckhausen, 2006	Parental Warmth Scale	Associated with mental health composite measure (B=.08)
Co-Parenting Cohesion	Linares, et al., 2010	Co-Parenting Practices, conflict/triangulation subscale	Conflict/triangulation subscale was positively related to CBCL Internalizing and Externalizing symptoms

Table 2.1 Studies of Home Environment Elements Tested with Mental Health Outcomes-Cont'd

Multi-Item Scales

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Co-Parenting Cohesion	Linares, et al., 2010	Co-Parenting Practices, conflict/triangulation subscale	Conflict/triangulation subscale was positively related to CBCL Internalizing and Externalizing symptoms

Table 2.1 Studies of Home Environment Elements Tested with Mental Health Outcomes-Cont'd

Multi-Item Scales

Construct	*Author*	*Scale/*=Item*	*Outcome*
Sibling Relationship	Wojciak, McWey & Helfrich, 2013	2-Items re: sibling relationship strength from the UCB F.Care study	CBCL Internalizing was mediated by sibling relationship, (bootstrapping mediation test t(141)=2.4)
Family Support	Kelley, Whitley & Campos	The Family Supports Scale	No significant relationship with CBCL scales
Support from Parents Scale	Farruggia et al., 2006	Perceived Parental Support	No significant association with mental health composite measure
Connections with Birth Family	Delfabbro, Barber & Cooper, 2002	3-Item scale re: frequency and quality of birth family visits	No significant association between psychological adjustment and change in frequency of contact; better adjustment, contact & reunification associated

Single Items

Construct	*Author*	*Scale/*=Item*	*Outcome*
Kinship Care	Holtan, Rønning, Handegård & Sourander, 2005	Kinship/Non-kinship care	CBCL scales (Total Problems, Social Problems, Attention Problems, Delinquent Behavior) were higher among non-kinship foster children (no ES reported)
	Hegar & Rosenthal, 2011	Kinship/Non-kinship care	Kinship care was inversely associated with CBCL scales, positively associated with TRF scales and non-significant for YRS scales, standardized coefficients were not reported
	Garcia et al., 2014	Kinship/Non-kinship care	Youth living within stranger care where the caregiver gets depressed are the most likely to report higher CBCL scores, those living in kinship care where the caregiver improved over time were more likely to report lower CBCL scores.

Table 2.1 Studies of Home Environment Elements Tested with Mental Health Outcomes-Cont'd

Single Items

Construct	*Author*	*Scale/*=Item*	*Outcome*
	Shore, Sim, Le Prohn & Keller, 2002	Kinship/Non-kinship care	Youth in Kinship homes had higher CBCL delinquency scores (t=2.36), no significant difference in internalizing or externalizing CBCL scores between kin and non-kin homes.
Living with Sibling(s)	Hager & Rosenthal, 2011	Living with sibling	No significant effects of sibling placement status on CBCL or YRS, siblings living together in kinship care fared better on the TRF than those living w/o a sibling
	Davidson-Arad & Klein, 2011	Living with sibling	Children living with a sibling scored higher on QOL scale than those living apart (*F(1,194)=10.01, eta²=.05)*
Depressed Caregiver	Garcia et al., 2014	5 point scale, 1 item	See Garcia et al., 2014 cited above
Caregiver Health	Tarren-Sweeney, 2008	Coded open-ended question	Foster youth living in stranger care reported higher CBCL scores (Cohen's *d*=.65, p<.01); Caregivers with poor health increase the risk for higher CBCL scores (Cohen's *d*=.65, p<..05)
Geographic proximity to birth home	Holtan et al., 2005	Item determining if child lived in same municipality as birth family	Children living outside of their community of birth were at increased risk of CBCL scores in the borderline or clinical range (OR=2.6).
Parental Caring	Harpin, Kenyon, Kools, Bearinger & Ireland, 2013	"How much do you feel your parents care about you?"	Parental Caring was inversely associated with emotional distress (ß=-.11)
Family Functioning	Stoner, Leon & Fuller, 2013	Family function single item	Family function item was predictive of lower depression scores (no E.S.)

Chapter 3: Methods

Research Questions and Hypotheses

Optimally, exploring the heterogeneity of foster homes in terms of characteristics measured in the literature would involve testing model 2.1 against a dataset containing all such variables. However, to the author's knowledge, a sufficiently extensive collection of data did not exist. Nevertheless, the SIBS_FC dataset (outlined below) included a sample of variables that is sufficiently robust to conduct a meaningful exploration that can add to prior research on quality foster home environments. Moreover, the dataset included outcome variables that could be added to the models to contribute to the understanding of how foster home quality impacts the mental health of foster children. A full description of the dataset follows an outline of the research questions and hypotheses of the study.

Research questions 1 thru 3 were based on an exploratory theoretical approach to data analysis. They required person-centered techniques, with the foster home being analyzed as the "person" and primary unit of analysis. Questions 4 and 5 used a more traditional, variable-centered analytic approach.

Research Question 1: Can foster home environments be classified or categorized in such a way that distinguishes one type of foster home from another?

Research Question 2: How many clusters or classes of foster homes can be identified given the measured variables in the dataset?

Research Question 3: What variables are most indicative of each class or cluster of foster home?

Research Question 4: Are there differences in baseline mean scores of outcome variables based on membership in a particular class or cluster of foster homes?

Research Question 5: How does the predicted membership in a particular class of foster home contribute to the stability of mental health outcomes of an adolescent foster child over a period of 18 months?

Hypothesis 1: Given measured variables, more than one category or class can be identified that distinguishes one type of foster home from another.

Hypothesis 2: Foster children who live in a type of foster home that is characterized by high levels of some or all of the variables of home integration, resources, cultural match, strong sibling relationships, living with kin and siblings, and having more contact with their biological parents will exhibit fewer negative mental health outcomes.

Hypothesis 3: Foster children who live in a type of foster home characterized by high levels of some or all the variables of home integration, resources, cultural match, strong sibling relationships, living with kin and siblings, and contact with their biological parents will improve on mental health measures more significantly over time than those foster youth living in homes characterized by low levels of the same measured variables.

Study Design

The dataset used to explore and test the aforementioned research questions and hypotheses was collected as part of the *Supporting Siblings in Foster Care* (SIBS-FC) intervention. SIBS-FC was a randomized clinical trial of an intervention designed to improve prosocial relationships among siblings in foster care. SIBS-FC has been the

largest study to date on the impact of a dyadic sibling intervention for youth in the foster care system (Kothari et al., 2017). The intervention provided up to eight relationship-based, skill-building sessions to sibling dyads. Up to four community-based sessions were also provided wherein skills discussed during the course of the eight treatment sessions were put into practice.

SIBS-FC Participants

Data were collected from 328 siblings in foster care throughout the greater Portland, OR metro area (164 older siblings with a mean age=13.1 and 164 younger siblings with a mean age=10.7). Demographic data collected during the baseline assessment indicated that the average difference in age between siblings was 2.4 years (SD=1.10). The majority of sibling dyads (73%) lived together. The average length of stay within the foster home was two years. The racial makeup of the sample was 40% White, 13% African American, 5% Native American, 2% Asian; in addition, 28% were multiracial and 13% reported 'other'. [As a reference, the racial makeup of Oregon is 88.1% White, 2.0% African American, 1.8% Native American, and 4.1% Asian (U.S. Census Bureau, 2013). In the Oregon foster care system, the racial composition is 84.3% White, 8.8% African American and 6.8% Native American (the prevalence of Asian foster children was not available, Oregon Department of Human Services, 2015).] Half of the sample identified as male, and the other half identified as female.

Foster parents identified as either primary (n=195) or secondary (n=111). The primary foster parents ranged in age from 21.5 to 74.2 (M=47.4, SD=12.0) at the time of the baseline assessment. Most of the primary foster parents (89%) were female. The

foster parents identified primarily as White (58%) or African American (27%). Sixty-eight percent of primary foster parents had attended some college.

Study Procedures

Recruitment into the SIBS-FC study was handled by an individual who was jointly employed by the State of Oregon, Department of Human Services (DHS) and Portland State University. Her position with the state allowed her access to the DHS administrative database and the necessary child- and family-level information to identify potential study participants. Participants who met inclusion criteria (i.e., youth in foster care with a sibling, with an older sibling between the ages of 11 and 15 years old and the younger sibling no more than four years younger, English speaking, with a residence within the three-county Portland metropolitan region) were identified and contacted via their caseworkers. As the State of Oregon is the foster child's legal guardian, consent to participate was requested of the DHS caseworkers and assent was obtained from the participants.

For those youth who agreed to participate, information was sent to their foster parent along with an invitation to participate in an orientation meeting to explain the program and answer any questions. The orientation provided parents and foster children with a clear understanding of the design and objectives of the project. Orientations were primarily conducted in the homes of the participants.

Randomization

Once a child had agreed to participate, a baseline assessment was conducted. After the baseline data were collected from the siblings, similar sibling dyads were yoked together on the variables of age, race and living situation then randomly assigned into the treatment or control group.

Data Collection

Data collection occurred across an 18-month period. Four major data collection waves involved structured assessments, with assessments completed every six months. Assessments were administered to the enrolled siblings, their foster parents/caregivers, teachers, and caseworkers. Some modification to this procedure occurred if there was a placement change, a change in caseworker, or a change in teacher at any time during the study. In these cases, a new orientation procedure with the new foster parents, caseworkers, or teachers was provided to inform the new participant of the foster child's enrollment in the study and to request the participation of the new individual.

Additionally, foster parents were contacted every two months to assess transitions, the general well-being of the foster child and utilization of any services by the child. Child characteristics and historical data were pulled from the administrative database in compliance with the requirements of the IRB at Portland State University and the State of Oregon, Department of Human Services.

Data on a portion of the foster home environment variables outlined in the previous chapter were collected as part of the SIBS-FC study. Specifically, data were gathered on whether youth were living in kinship care, their contact with the biological

Table 3.1 Full Sample Demographics

Caregivers	*M (SD)*	*Range*
Primary Foster Parent Age (N=181)	47.2 (12.0)	21.5-74.2
Secondary Foster Parent Age (N=103)	35.9 (12.8)	23.1-80.0
Racial Identification of the Foster Parent	*Primary*	*Secondary*
Native American	4%	3%
Asian	1%	2%
African American	27%	17%
White	58%	64%
Multi-Racial	3%	4%
Other	7%	10%
Gender		
Female	89%	25%
Male	11%	75%
Education (Highest Level)		
8th Grade or Less	6%	3%
Some High School	8%	8%
High School Graduate/GED	18%	31%
Some College	31%	32%
Two-Year College Degree	15%	11%
Four-Year College Degree	15%	12%
Graduate Degree	7%	4%
Household Income		
Less than $1,000/month	2%	
Between $1,000-$1,999/month	5%	
Between $2,000-$2,999/month	11%	
Between $3,000-$3,999/month	21%	
Between $4,000-$4,999/month	23%	
Between $5,000-$5,999/month	16%	
Between $6,000-$6,999/month	9%	
Between $7,000-$7,999/month	3%	
$8,000/month or more	9%	

Table 3.1 Full Sample Demographics cont'd

Foster Youth	*Mean (SD)*	
	Older Sib	Younger Sib
Age at baseline	13.1 (1.5)	10.7 (1.74)
Racial Identification		
Native American	5%	5%
Asian	1%	1%
African American	13%	12%
White	40%	40%
Multi-Racial	28%	27%
Other	12%	14%
Gender		
Female	53%	49%
Male	47%	51%
Living Situation at Baseline		
Together with sibling	72%	
Current Living Situation		
Non-Relative Foster Care	57%	60%
Kinship Foster Care	31%	30%
Group Home	>1%	0%
Residential Treatment	1%	>1%
Bio Family	10%	10%

family, whether youth were living with a sibling, and the cultural match between the caregiver and the foster child. Some constructs identified in the literature were also examined in the SIBS-FC study with distinct measurement instruments, specifically, the level of family resources was assessed via a continuous measure of household monthly income. In addition, a scale pertaining to positive home integration (discussed below) was used that included questions regarding the foster youth's perceived inclusion in the foster family. Tables 3.1 and 3.2 list the descriptive statistics of the variables used in the analyses.

Measures

Foster Parent Demographics

The demographic instrument was used to assess 11 variables in the theoretical model. The survey-based instrument asked questions of both the primary foster parent and the secondary foster parent when applicable. Questions included:

- The nature of the relationship between the foster parent and the foster child, which was used to determine whether or not a child lived in kinship care;
- race and ethnicity of the foster parent, which was used to determine whether the racial and or ethnic backgrounds were similar between foster parent and foster child;
- education level of the foster parent;
- length of time a foster parent had been fostering;
- total number of foster children cared for (a proxy for experience in providing care).

In addition, household information gathered included:

- Monthly income, which was used as a measure of resources;
- number of household members (including adults and children) living in the home, which was considered to indicate the available personal support and/or increased burdens and responsibilities of the foster parent;
- length of time the foster parent has known the foster child;
- length of time the foster child has lived in the home with the foster parent.

Lastly, the survey asked the foster parent to identify whether the child had contact with members of his/her biological family and if so, the frequency and type of those contacts.

The Essential Youth Experiences-Positive Home Integration Scale

The Essential Youth Experiences (EYE) instrument was designed to capture the perspectives of foster youth in their interactions with foster parents, caseworkers, teachers, and other key adults. Items were developed to capture the degree to which the foster youth feels welcomed by the adult, is respected in his or her preferences, and has a positive relationship with the adult. The youth's experience in the foster home was assessed with an 11-item subscale: four items concerned the quality of the youth's experience with the primary foster parent; and seven items assessed the frequency of foster parent/foster child interaction and the quality of treatment in the foster home, taking into account all members of the foster family. Cronbach's alpha suggests a high level of internal consistency within the positive home integration scale (alpha=.88).

Descriptive Statistics

Descriptive statistics for the variables used for subsequent analysis (described below) are as follows:

Kinship Care

Among older siblings, 40.7% lived with a relative; while among younger siblings, 39.9% lived with a relative.

Living with Sibling

Nearly three-fourths (72%) of the siblings lived together.

Racial and Ethnic Match

This variable was calculated by comparing the racial identity found in the youth demographic survey with the racial identity reported on the Foster Parent demographic survey. A racial match was determined if either the primary or the secondary foster parent identified as being of the same racial background as the youth. For the older siblings, 73% reported having the same racial identity as at least one of their foster parents, whereas 69% of the younger siblings reported a racial match. With respect to ethnicity (calculated in the same way as race), 94% of the older siblings and 93% of younger siblings were of the same ethnicity as one of their foster parents and 93% of younger siblings reported having an ethnic match.

Foster Parent Education

This construct was measured with the parent survey on a quasi-continuous scale using seven options: 1=8th grade or less, 2=some high school, 3=high school graduate or GED recipient, 4=some college, 5=two-year college graduate, 6=four-year college graduate, 7=graduate school. The mean level of education for foster parents was 4.13 and 4.04 for older and younger siblings, respectively. This suggests that, on average, foster parents had some college. For subsequent analysis (i.e., the LCA), the variable was dichotomized into a variable that separates foster parents with any level of college education (OS=66.4%, YS=67.4%) from those parents with none.

Length of Time as a Foster Parent

Among older siblings, the average number of months spent as a foster parent was 76.9 months (Min=1, Max=360, SD=81.0); and for the younger siblings, the average number of months as a foster parent was 77.9 (Min=1, Max=360, SD=82.7). For the LCA, this variable was dichotomized at the median, such that 48.4% and 48.6% of the

primary foster parents reported that they had fostered for 48 months or more for older and younger siblings respectively. As for secondary foster parents, 50.0% and 48.1% reported that they had fostered children for 40 months or more for older and younger siblings respectively.

Total Number of Children Fostered

In the families of the older siblings, the average total number of children fostered was 14.96 (Min=1, Max=300, SD=37.8); while the younger siblings had an average of 16.59 (Min=1, Max=300, SD=38.16). This variable was dichotomized at the median (Mdn=5 for both OS and YS), which resulted in 56.2% and 55.4% of the primary foster parents having fostered at least five children for the older and younger siblings respectively.

Monthly Income

Income from foster parenting was assessed with a categorical question with choices ranging from 0-$8,000/month in $1,000 increments. For the older siblings, percentages of households in each category were as follows: up to $1,000: 2.6%, $2K: 6%, $3K: 12.9%, $4K: 16.4%, $5K: 24.1%, $6K: 18.1%, $7K: 8.6%, and $8K: 4.3%, >$8K: 6.9%. In households of the younger siblings, reported income category percentages were: 1.7%, 5.9%, 10.9%, 21%, 21%, 16.8%, 9.2%, 3.3% and 10% respectively. The average monthly income was $5,050 and $5,180 for older and younger siblings respectively. Additionally, a dichotomous variable assessing poverty level was created based on the 2010 poverty guidelines (U.S. Department of Health and Human Services, Office of the Assistant Secretary for Planning and Evaluation,2010). Original responses were recoded to the median of the response range (for example, a response of

$2,000-$3,000 was recoded to $2,500) and used in conjunction with household size to determine if a foster home met criteria for poverty at the federal level. Among the foster parents of older siblings, 13.3% met criteria for poverty, and slightly fewer foster parents (11.2%) of younger siblings met criteria (with 12.3% of all foster parents falling in the poverty range).

Number of Household Members

The variable pertaining to the number of members of the household was assessed with the youth's response to the questions of "How many adults live in the home with you?" and "How many youth live in your current foster placement?" The responses to these two questions were summed to determine household size. For older siblings and younger siblings, respectively, the average household size was 4.72 (Min=1, Max=25, SD=2.74) and 4.66 (Min=1, Max=12, SD=2.16). A dichotomous variable was created, and split at the median (Mdn=4 for OS and YS). For older siblings, 62.3% of foster homes had four or more children or adults; and 66.5% of younger sibling foster homes reported a household size greater than or equal to four.

Months in Placement

The stability of the foster parent/child relationship was assessed with a question of how many months the child had lived in the foster parent's home. The mean length of time was 32.86 months for the older siblings (Min=1, Max=180, SD=45.89) and 30.41 months (Min=0, Max=168, SD=39.19) for the younger siblings. In order to categorize this variable for use in subsequent LCA analyses, the median time spent in the foster home was 9 months for older siblings and 12 months for younger siblings. Among the

older siblings, 54.7% had lived in their foster home for 9 months or more, whereas 52.4% of the younger siblings had lived in their foster home for 12 months or more.

Foster Child Contact with Biological Family

This variable was calculated as a dichotomous variable. A value of 1 was assigned to cases in which the youth indicated that one of the adults with whom they had contact was a biological parent. 62.34% of older siblings indicated having some contact with a biological parent, and 63.80% of younger siblings reported having contact with at least one biological parent contact.

Positive Home Integration Scale

The relationship of the foster youth with their foster parent was assessed by using the PHI scale of the EYE instrument. Older siblings reported a mean of 8.72 (Min=4.3, Max=10, SD=1.26), and younger siblings reported a mean of 8.73 (Min=3.9, Max=10, SD=1.24). For LCA analyses, responses were dichotomized at the median of the total sample. Among the older siblings, 51.6% reported a positive home integration score of 9.18 or more. Among the younger siblings, 48.8% indicated a PHI score of 9.18 or better.

Sibling Relationship Scale

Older siblings reported a mean of 3.65 (Min=1.70, Max=4.78, SD=.72), and younger siblings reported a mean of 3.67 (Min=1.40, Max=4.86, SD=.66). The SRQ was also dichotomized at the median, with 53.1% of older siblings indicating an SRQ score of 3.7 or better, and 52.2% of younger siblings reporting an SRQ score of 3.7 or better.

Outcome Variables

Children's Depression Inventory

The Children's Depression Inventory (CDI) is a 27-item scale designed for use with children six years of age or older. The measure is composed of five subscales or factors (i.e., negative mood, interpersonal problems, ineffectiveness, anhedonia, and negative self-worth). Scores can range from 0-54, with higher scores indicating more depression. A clinically significant threshold was identified by the author as 19 or 20 (Kovacs, 1992). The measure has strong internal consistency with the SIBS-FC sample (alpha=.88).

Child Report of Posttraumatic Symptoms

The Child Report of Posttraumatic Symptoms (CROPS) was created by Greenwald and Rubin (1999) and developed in response to the limitations of similar measures available at the time. Items on the CROPS were identified based on prominent symptoms found in Fletcher's (1993) meta-analysis of child trauma and those described in the DSM-IV. Five experts evaluated the items for content validity; then a pilot study with 30 children provided feedback resulting in 28 items scored on a 0-2 scale respective of the symptoms experienced over the previous seven days. The finalized instrument was then administered to a sample of 206 children composed of 83% minority students (of which 53% identified as African American, 23% as Hispanic, and 7% other). The age range was 8 to 15 (Mdn age=11.5), and 49% were males. An additional instrument was developed for this validation study as a measure of lifetime trauma events (LITE, Greenwald & Rubin, 1999). CROPS scores and LITE ratings were significantly correlated (r=.60, p<.001). The CROPS was found to have strong internal consistency (alpha=.89) with the SIBS-FC sample.

Child Behavior Checklist

The Child Behavior Checklist (CBCL) for children aged 6-18 is one of the most ubiquitous quantitative instruments of mental health symptomatology used in research and practice involving youth. The CBCL is comprised of eight subscales (anxious/depressed, withdrawn/depressed, somatic complaints, social problems, thought problems, attention problems rule-breaking behavior, and aggressive behavior) that are generally combined and reported on as either internalizing, externalizing, or total problem scores (Achenbach, 1991). The CBCL represents the perspective of an adult's observations of the youth; in the case of the SIBS-FC study and the current analysis, the perspective is of the primary foster parent. Internal reliability for the SIBS-FC sample was very strong (alpha=.97 for total problem scale).

Hopelessness Scale for Children

The Hopelessness Scale for Children (HSC) was developed to assess hopelessness as a component of depression (along with negative view of oneself and negative view of the world) (Beck, 1976). The instrument includes 17 true/false items with higher sum scores indicating more hopelessness. The scale as a whole has adequate internal consistency (alpha=.77). There are two subscales/factors of the HSC: one that indicates a respondent's future expectations and giving up; and another that focuses on overall happiness and future expectations (Kazdin, Rodgers, & Colbus, 1986). Descriptive statistics broken down by siblings are detailed in Table 3.2.

Table 3.2 Descriptive Statistics by Sibling

Older Siblings				
Variable	*n*	*%*	*M*	*SD*
In Kinship Care	162	40.7%		
Living without Sibling	162	27.8%		
Racially Matched	115	73.0%		
Ethnic Match	102	94.0%		
Foster Parent Education	140		4.13	1.6
High School or above		85.0%		
Bachelor's degree or above		23.5%		
Any College		66.4%		
Length of Time as a Foster Parent	94		76.88	81.00
Total Number of Children Fostered	73		14.96	37.81
FP Monthly Income (in thousands)	116		5.05	1.92
Number of Household Members	159		4.72	2.74
Months child has lived in the home	143		32.86	45.89
Child has contact with bio family	162	62.3%		
Positive Home integration scale	158		8.72	1.26
Sibling Relationship Scale	162		3.65	0.72
Children's Depression Scale	162		8.09	7.88
Children's Report of PTSD	158		20.30	9.70
Hopelessness Scale	158		30.27	7.26
CBCL Internalizing Raw Score	155		11.95	8.60
CBCL Externalizing Raw Score	155		16.17	13.04
CBCL Total Raw Score	155		49.75	32.99

Table 3.2 Descriptive Statistics by sibling cont'd

Younger Siblings				
Variable	*n*	*%*	*M*	*SD*
In Kinship Care	163	41.0%		
Living without Sibling	163	28.0%		
Racially Matched	116	69.0%		
Ethnic Match	103	93.0%		
Foster Parent Education	141		4.04	1.49
High School or above		85.5%		
Bachelor's degree or above		19.5%		
Any College		67.4%		
Length of Time as a Foster Parent	94		77.91	82.82
Total Number of Children Fostered	92		16.59	38.16
FP Monthly Income (in thousands)	119		5.18	1.97
Number of Household Members	161		4.66	2.16
Months child has lived in the home	141		30.41	39.19
Child has contact with bio family	163	63.8%		
Positive Home integration scale	159		8.73	1.24
Sibling Relationship Scale	162		3.67	0.66
Children's Depression Scale	160		6.95	6.08
Children's Report of PTSD	159		21.08	9.32
Hopelessness Scale	151		31.31	7.57
CBCL Internalizing Raw Score	157		10.22	8.51
CBCL Externalizing Raw Score	157		14.37	11.33
CBCL Total Raw Score	157		46.34	31.86

Analytic Approach

The studies that were presented in the literature review, and that served to form the foundational theoretical model, derived their findings by way of variable-centered techniques such as multivariate regression, group comparisons with ANOVA, chi-square, or logistic regression analyses. Such analytic techniques are useful strategies in predicting the impact of indicator variables on individual outcome variables.

As discussed in the theoretical framework section of Chapter 2, some analytic approaches may be better suited for examining the units of analysis more than the

variance of the measures used. These types of methods are collectively known as person-centered or person-oriented analytic techniques; they allow the researcher to understand how people resemble each other and can be used to group people by their commonalities. This study included these types of analyses, with the foster home environment being the individual unit of study.

One method of person-centered analysis is cluster analysis. This is a general, exploratory approach that looks for groups or clusters of observations that are similar among themselves but separate from other clusters. Two common exploratory cluster analytic algorithms are hierarchical agglomerative cluster analysis and K-means cluster analysis.

Hierarchical Agglomerative Cluster Analysis

Hierarchical agglomerative cluster analysis (HACA) looks at single cases then systematically associates them with the next closest resembling case. This procedure is repeated until all cases are merged into one cluster. A visual representation of this process, known as a dendrogram, is produced and can be used to examine the order in which cases are merged through the vertical spacing of those merge points. The closer to the bottom of the dendrogram, the more closely the cases resemble each other; in contrast, the farther up the y-axis a merge point is, the more distinct is the cluster. Cutoff points are determined by the researcher based on a visual inspection of the dendrogram (Manning, Raghavan & Schütze, 2000)

K-Means Cluster Analysis

The second approach is known as K-means cluster analysis and is a centroid-based algorithm that requires the analyst to indicate the number of centroids to use when

beginning the clustering. The arbitrary number of centroids specifies a number of randomly selected cases that serve as center points (means) of clusters. Means of each cluster are calculated from the values of the variables selected as characteristics of the cases being clustered. The algorithm then systematically assigns cases to the nearest matching centroid one by one. Once new cases have been assigned, a new mean is calculated for each cluster and the process repeats itself until all cases are included in clusters. Once a case has been assigned, it may change clusters as new means are calculated. All cases are continuously rechecked with each new calculation to ensure that they are connected to the cluster with the closest mean value. The algorithm attempts to minimize the within-group variance and maximize the between-group variance. This approach is known as 'flat clustering' in that there is no hierarchy of clusters as is the case with the HACA method (University of Cincinnati, 2018).

Latent Class Analysis

The third clustering approach utilized in this study was latent class analysis (LCA). LCA refers to clusters as classes and assumes that an overarching construct or explanatory variable with distinct categories reflects a subject's expression of measured characteristics. The characteristics, which are known as manifest variables, are theoretically selected by the researcher based on existing literature, theory, and available measured variables. Unlike the concrete assignment of cases to clusters in cluster analysis, LCA estimates the probability that participants will pertain to a specific class based on their responses to the measured variables.

Similar to the HACA method, LCA relies on the researcher to identify the number of distinct classes found within the latent variables. Separate models are then tested with

varying numbers of proposed classes and compared, based on deviance statistics (such as the Akaike information criterion (AIC) and the Bayesian information criterion (BIC)) and interpretability of the model. Ideally, the most appropriate model would have the lowest deviance statistic and be the most interpretable of the models tested. In some cases, models may be more useful in terms of their interpretability but have a higher deviance statistic than the less interpretable model. In the case of LCA, the researcher must determine which model is most useful in describing the data.

These clustering approaches were used to propose typologies of foster homes. The typologies were specific to the method of analysis and based on measured variables theorized as indicators of quality. Within each typology, participants pertained to one type of foster home or another. Types were then used as an independent variable in variable-centered analyses. Specifically, the variance of mental health outcomes of foster youth was examined as dependent on the type of foster home to which a youth pertained.

An exemplary study that illustrates the rigorous exploration of a typology of foster homes was conducted by Zinn and colleagues (2010). In seeking to understand the important characteristics related to distinctive classes of kinship care, the authors sought to determine whether kinship foster homes could be broken into distinct classes of an overarching latent variable. The manifest variables that were included in the analysis were partner status between caregivers, relationship to foster child, the number and ages of non-foster children and the number of adults living in the home. They found four distinct classes of kinship foster homes: empty nest grandparents; parenting grandparents; collateral kin with some children; and parenting collateral kin). Comparisons between

the classes suggested that there were distinct differences in important variables (such as parental employment and caregiver fostering competence).

Figure 3.1 illustrates the manifest variables that were available in the SIBS-FC dataset. The selected variables reflected, as closely as possible, those related to the foster home environment found in the literature and that were hypothesized to be related to mental health outcomes. While the proposed model was unable to fully reflect the theoretical model derived from the literature, it was hypothesized that the proposed model and the data that had been collected provided an adequate reflection of many of the theorized constructs. It was further expected that there was sufficient variability between foster homes to identify typologies sufficient to answer the proposed research questions.

Analysis by Research Question

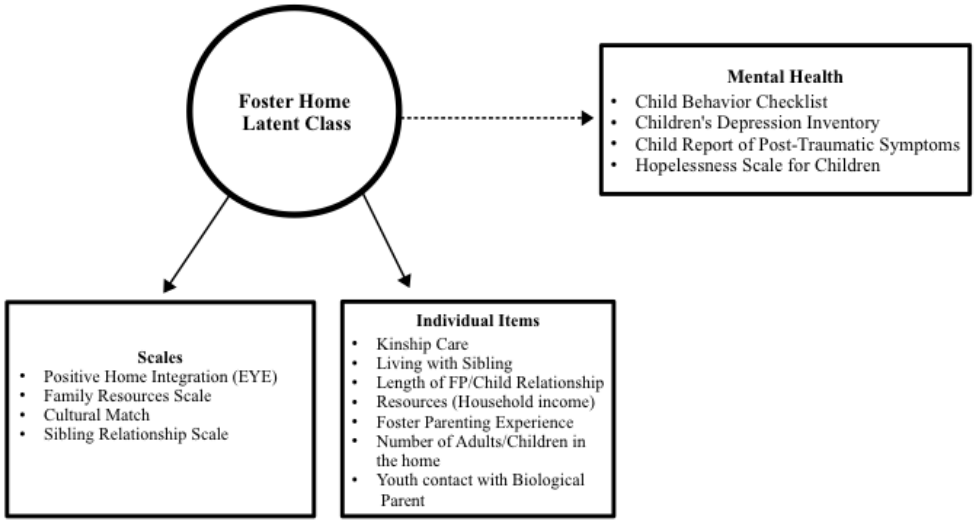
Research Question 1

The first research question was addressed using all three cluster analysis approaches summarized above. The hypothetical model illustrated in Figure 3.1 guided the selection of available variables from the SIBS-FC dataset that were needed to explore potential foster home types. Variables for the HACA and K-means analysis were used as continuous and numeric. For the LCA, variables were recoded as categorical and then dichotomized at the older or younger sibling group's median.

The LCA analysis followed the procedures outlined in Collings and Lanza (2010), by first examining marginal frequencies of responses to all the manifest variables. Then a contingency table of response patterns was produced, which helped to determine how many classes to specify when running the LCA models. An LCA model with one class

was created as a baseline and used to compare successively complex models. The model with the most interpretability and lowest deviance statistics was then chosen as the typology.

Figure 3.1 Latent Class Model Based on Available SIBS-FC Data



The HACA analysis proceeded with the creation of a dendrogram that was used to determine the extent that clustering occurred in the dataset. The K-means approach was informed by the HACA results, by using the number of groups found in the HACA analyses to specify the number of centroids that were used for the K-means analysis.

Research Question 2

The second research question was answered by examining how many foster home types were found after conducting all three analytic techniques for Research Question 1.

Research Question 3

The third research question was answered by comparing the foster home types derived from the HACA and K-means approaches with the focus on the mean values of the indicator variables; those with discrepancies of at least 20% difference between types

were identified as indicative of foster home type. The LCA analysis examined the predicted response patterns of the manifest variables in the model selected. Variables that had 20% or greater probability of indicating one class over another were identified as indicative of type.

Research Question 4

The fourth research question used a similar approach to comparing mean baseline outcome scores on mental health indicators, as reflected in the analytical strategy used by Zinn and colleagues (2010). Specifically, participants were assigned to foster home type, as outlined above; then the mental health outcome measure means of those foster home types were compared using ANOVA tests.

Research Question 5

The final research question used the same assignments of participants to their most likely foster home type. Type of home/group membership was included as an independent variable in hierarchical linear models to predict change in outcomes over time. Most participants were surveyed four times (baseline, 6-, 12-, and 18-month follow-ups), and all data points were used for these analyses. Hierarchical linear modeling, with time nested in the individual following the Singer and Willett (2003) modeling approach, was used to account for the repeated measures. This is due to the likelihood that the errors of each predicted outcome would have less variance among participants than between participants and subsequently produce artificially low standard errors (and inflated statistical significance). The correlation among participants' repeated responses (known as the intra-class correlation or ICC) was noted for each model.

An intercepts-only model was the first of the HLM analyses. This model produced an average intercept (i.e., the baseline outcome measure) and the random effect of the intercept. The random effect is an indication of how widely intercepts varied between the participants. The second model included group membership (either defined by the HACA, K-means, or LCA method of clustering) and treatment condition. [As these data were collected as part of a randomized control study, the treatment condition was an important covariate to include.] Finally, the third model included group membership, treatment condition, time, and an interaction term for time and group membership. Time was centered at the final follow-up wave. Models were compared with ANOVA tests while estimating the chi-square value of the log likelihood statistic. All analyses were conducted in R (R Core Team, 2013) and included the poLCA (Linzer & Lewis, 2011) and nlme (Pinheiro, Bates, DebRoy, Sarkar, 2013) packages.

Chapter 4: Results

This chapter presents the results of all analyses concerning the previously discussed research questions:

- *Research Question 1*: Can foster home environments be classified or categorized in such a way that distinguishes one type of foster home from another?
- *Research Question 2:* How many clusters or classes of foster homes can be identified given the measured variables in the dataset?
- *Research Question 3:* What variables are most indicative of each class or cluster of foster homes?
- *Research Question 4:* Are there differences in baseline mean scores of outcome variables based on membership in a particular class or cluster of foster homes?
- *Research Question 5:* How does the predicted membership in a particular class of foster home contribute to the stability of mental health outcomes of an adolescent in foster care over a period of 18 months?

Before describing specific results of the five research questions, a summary of statistically significant bivariate correlations is first provided, followed by an explanation of how missing data were handled.

Bivariate Correlations

Pearson correlations were run on the previously mentioned variables. For the older siblings, there were 17 (25.8%) statistically significant correlations between

clustering variables of the possible 66 correlations. For younger siblings, 19 (28.8%) statistically significant correlations were found (see tables 4.1 and 4.2).

For the LCA models, statistically significant correlations presented a challenge to the assumption of local independence. Nevertheless, the variables were critical for answering the research questions: removing the correlated variables from the LCA models would greatly diminish their usefulness.

Significant correlations were also found with the outcome variables and the indicator variables. There were 12 (16.7%) and 15 (20.8%) bivariate correlations for older and younger siblings respectively of the possible 72 combinations between outcome and indicator variables (excluding correlations between outcome variables). Notably, kinship care and PHI were inversely correlated with several of the mental health outcomes for both older and younger siblings, whereas foster parent education was positively correlated with CBCL scores for the younger siblings.

Table 4.1 Bivariate Correlations for Clustering and Outcome Variables

Older Siblings

Variables	1	2	3	4	5	6	7	8	9
1. Kinship Care	-								
2. Living w/o Sibling	-.29***	-							
3. Racial Match with a FP	0.18	-0.1	-						
4. Foster Parent education	-.32***	.20*	-0.04	-					
5. Length of Time as FP	-.33**	0	-0.06	.22*	-				
6. Total Number of Children Fostered	-.24*	-0.04	-0.2	-0.09	.71***	-			
7. Monthly Income	-0.13	-0.05	-0.04	0.15	0.02	0.13	-		
8. Number of Household members	-0.06	-0.09	0.1	-0.16	-0.11	-0.01	.2*	-	
9. How Long Youth has Lived in the home	.21*	-.23*	0.13	-0.14	.40***	.29*	-0.04	-0.04	-
10. Contact with Bio Parent	-0.08	0.03	-0.11	0.14	-0.1	-0.19	-0.04	0.08	-.25**
11. Positive Home Integration Scale	0.15	0.03	-0.06	0.05	0.03	-0.07	-.21*	-0.06	0.07
12. Sibling Relationship Scale	-0.11	.22**	-0.13	0.03	.26*	0.03	-0.18	-.16*	0.03
13. CBCL Internalizing	-0.14	0.16	-0.05	0.06	0.09	-0.18	0.03	-0.05	0.07
14.CBCL Externalizing	-.22**	0.14	-0.05	0.11	0	-0.11	0	0.02	0
15. CBCL Total Score	-.28***	0.15	-0.07	0.13	0.11	-0.12	0.11	-0.01	0.02
16. CDI	-0.06	.17*	0.1	0.02	-.22*	-0.12	0.01	0	-0.1
17. CROPS	-0.06	0.12	-0.03	0.04	-0.03	-0.14	0.1	0.05	0.04
18. Hopelessness Scale	0.04	0.05	0.09	-0.11	-0.2	-0.06	0.15	-0.03	0.05

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

Table 4.1 Bivariate Correlations for Clustering and Outcome Variables Cont'd

Older Siblings

Variables	10	11	12	13	14	15	16	17
1. Kinship Care								
2. Living w/o Sibling								
3. Racial Match with a FP								
4. Foster Parent education								
5. Length of Time as FP								
6. Total Number of Children Fostered								
7. Monthly Income								
8. Number of Household members								
9. How Long Youth has Lived in the home								
10. Contact with Bio Parent	-							
11. Positive Home Integration Scale	-0.12	-						
12. Sibling Relationship Scale	-0.08	.22**	-					
13. CBCL Internalizing	0.02	-.21**	-0.06	-				
14.CBCL Externalizing	0.03	-.23**	0.03	.56***	-			
15. CBCL Total Score	0.01	-.26**	0.01	.79***	.9***	-		
16. CDI	0	-.4***	-.17*	.34***	.22**	.3***	-	
17. CROPS	-0.05	-.2*	0.04	.34***	.22**	.3***	.7***	-
18. Hopelessness Scale	-0.03	-.25**	-.16*	0.01	0.05	0.09	.56***	.4***

*p<.05, **p<.01, ***p<.001

Table 4.2 Bivariate Correlations for Clustering Outcome Variables

Younger Sibling

Variables	1	2	3	4	5	6	7	8	9
1. Kinship Care	-								
2. Living w/o Sibling	-.26***	-							
3. Racial Match with a FP	.22*	-.24**	-						
4. Foster Parent education	-.35***	0.11	-0.07	-					
5. Length of Time as FP	-.39***	0.06	-0.15	0.03	-				
6. Total Number of Children Fostered	-.26*	0.04	-0.18	-0.09	.67***	-			
7. Monthly Income	-.19*	0.1	-0.09	0.16	0.1	0.11	-		
8. Number of Household members	0.04	-0.1	-0.07	-.21*	-0.1	0	.3**	-	
9. How Long Youth has Lived in the home	.22*	-0.12	0.2*	-0.13	.35***	.29**	-0.08	-0.07	-
10. Contact with Bio Parent	0.01	-0.01	-0.08	0.01	-0.13	-0.1	0.01	0.02	-.21*
11. Positive Home Integration Scale	-0.11	0.11	-0.07	-.19*	0.17	-0.02	-0.03	-0.08	0.04
12. Sibling Relationship Scale	-0.04	.2*	-0.2*	-.23**	0.16	0.17	-0.09	0.13	0.03
13. CBCL Internalizing	-.24**	0.14	-.21*	.23**	0.16	-0.11	0.09	0.02	-0.03
14. CBCL Externalizing	-.22**	-0.04	0.01	.25**	0.16	0.03	0.15	-0.07	0.08
15. CBCL Total Score	-.28***	0.07	-0.07	.27**	.21*	-0.04	0.17	-0.08	0.05
16. CDI	0.11	-0.09	-0.12	0.05	-0.11	-0.08	0.02	0.13	0.02
17. CROPS	0.02	-0.07	-0.03	-0.01	-0.1	-0.09	0.03	0.04	0.06
18. Hopelessness Scale	0.11	-0.1	-0.16	0.07	0.07	0.04	-.21*	-0.08	0.03

**p<.05, **p<.01, ***p<.001*

Table 4.2 Bivariate Correlations for Clustering Outcome Variables Cont'd

Younger Siblings

Variables	10	11	12	13	14	15	16	17
1. Kinship Care								
2. Living w/o Sibling								
3. Racial Match with a FP								
4. Foster Parent education								
5. Length of Time as FP								
6. Total Number of Children Fostered								
7. Monthly Income								
8. Number of Household members								
9. How Long Youth has Lived in the home								
10. Contact with Bio Parent	-							
11. Positive Home Integration Scale	0.03	-						
12. Sibling Relationship Scale	-0.04	0.15	-					
13. CBCL Internalizing	0.13	0.03	-0.01	-				
14. CBCL Externalizing	0.01	-.22**	0.01	.58***	-			
15. CBCL Total Score	0.03	-0.12	-0.04	.8***	.9***	-		
16. CDI	-.19*	-.39***	-0.11	.19*	.3***	.26**	-	
17. CROPS	-0.05	-.32***	0.07	.17*	.29***	.23**	.62***	-
18. Hopelessness Scale	-0.08	-.34***	-.22**	0.04	0.14	0.09	.56***	.36***

**p<.05, **p<.01, ***p<.001*

Missing Data Analysis

Missing data were a significant concern in both the older and younger sibling datasets. In fact, only four variables had complete data, including kinship care status, sibling togetherness, contact with a biological parent, and the total SRQ score. For the older sibling dataset, months living in the home had 19 missing cases, income level was missing 46 cases, foster parent experience was missing 68 cases, total number of children fostered was missing 89 cases, PHI scale score was missing 4 cases, and racial match was missing 47 cases. For the younger siblings, there were 22 missing cases for months in care, income was missing 44 cases, 70 cases were missing on foster parent experience, 71 cases were missing for total number of children fostered, 4 cases were missing the PHI, 47 cases for racial match were missing, and the SRQ total score was missing in 1 case.

Due to the low numbers of participants with complete data, a multiple imputation procedure was implemented to improve the likelihood of satisfactorily answering the research questions. Unless data are missing completely at random, missing data can result in limited statistical power and potential bias in the analysis. The data imputation process that was used to complete the dataset was implemented with the MICE Package in R (van Buuren, 2018). MICE (multivariate imputation by chained equation) is also known as fully conditional specification. The process "involves developing a multivariate distribution for missing data and drawing imputation from their conditional distributions by Markov chain Monte Carlo techniques" (van Buuren, 2011). Cluster analyses were conducted using both the original dataset as well as the imputed, full dataset.

Research Question-Specific Results

Research Questions 1 & 2

As described in the methods section, three cluster analysis approaches were used to answer the first two research questions. HACA, K-means, and LCA-based clustering techniques resulted in models that separated foster homes into distinct classifiable groups. This suggested that foster homes can indeed be classified into types of foster home environments. The groups are discussed below by analytic technique.

Hierarchical Agglomerative Cluster Analysis

The variables that were included in the clustering were: (a) kinship care status, (b) living without their sibling, (c) months living in the home, (d) income level of the foster home, (e) months of foster parent experience by the primary foster parent, (f) foster parent education, (g) total number of children that the primary foster parent has fostered, (h) how many people live in the home, (i) whether or not there is contact with biological parent, (j) positive home integration scale score, (k) racial match between the foster child and either foster parent, and (l) the sibling relationship scale score. Ethnic match was dropped in this group because of a high number of missing data and no variance among those who reported. For the analyses with the original dataset, cases with missing values were omitted and all variables were standardized for this procedure.

The dendrogram produced with the HACA method was used to determine how many clusters were identifiable (see Figure 4.1). Based on the older sibling data, a two-cluster solution seemed optimal given the distance on the Y-axis from the first cluster to the second cluster. However, the two-cluster solution was lopsided with 34 members in

one cluster and only three members in the other. A three- or four-cluster solution divided the group of 34 members into smaller groups, thereby offering an opportunity for a more nuanced inspection.

More detailed results of this exercise can be seen in Table 4.3 below. Some notable group distinctions were among the participants who constituted the largest group (n=18), 33% lived in kinship care; 28% lived apart from their sibling. These group members had been in care for 45.9 months and had lived in households with fewer people. Group two (n=9) had the largest number of youth living apart from their sibling and the shortest time in placement. Group three (n=7) was most likely to live in kinship care and to be racially matched with one of their foster parents.

The analysis was repeated using the completed data set in order to identify how a four-cluster solution would compare with the original dataset. For the older siblings, only two viable groups were identified with the remaining clusters composed of single participants. The first group was significantly larger than the other (n=124), representing approximately 75% of the participants. The remaining 25% made up the other cluster, with two individuals who did not fit into either group.

The larger group was classified as "alone with unrelated, educated, experienced and resourced foster parents." Compared to those in the other group, members were more likely to be living without their sibling, in a foster home with non-related foster parents, and with foster parents who were more educated, more experienced and had a higher income than the other group. The second group was classified as "Together with related, less educated, less experienced and less resourced foster parents". Members of this group were more likely to be in kinship care, to live with their sibling, and to be in a

home with foster parents with less education, experience and income. Graphs included in the Appendix B represent the relative values of the indicator variables for each group.

Figure 4.1, Dendrogram of Older Siblings with Complete Data

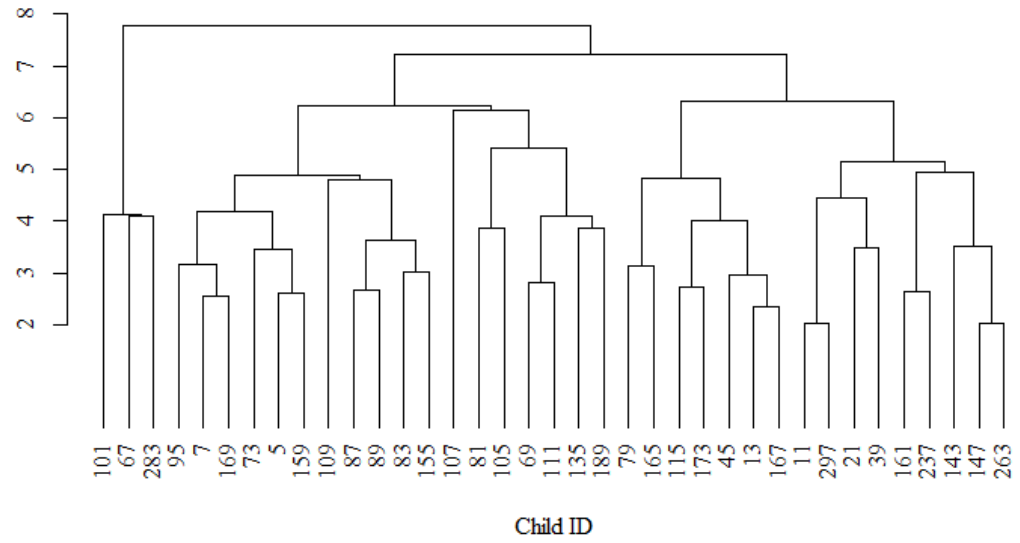
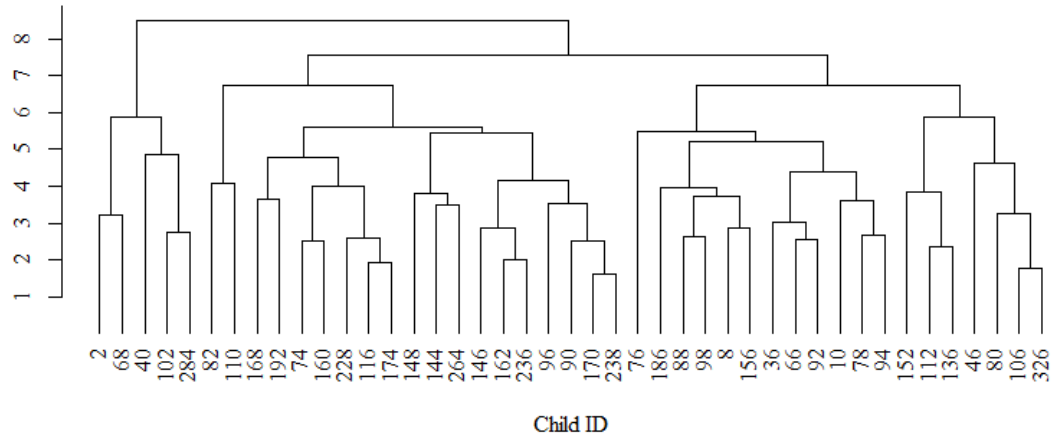


Figure 4.2, Dendrogram of Younger Siblings with Complete Data



Using the dendrogram from the younger sibling data (see Figure 4.2), solutions with two, three, four, or even five different clusters could have been suggested. For the sake of consistency with the older sibling data, a four-cluster solution was used to explore younger sibling group characteristics. Groups were more evenly split with the younger sibling dataset (n1=5, n2=12, n3=7, n4=19); and a four-group solution was used when repeating the analysis with the imputed data. When using the complete dataset, only three of the four specified groups had adequate numbers to use in further analyses. Names and descriptions of these groups are outlined below with additional details included in Table 4.3.

The largest group (n=124) was referred to as: "Higher educated, mid-level experienced foster parents." Compared to the other groups, group members fell in the middle of the range of values in terms of their defining variables. For instance, they were more likely to live in kinship care than the second largest group but less likely than the third largest group. This was the case in all but four of the variables. In those cases, they ranked the highest with respect to foster parent education; and they ranked the lowest in number living at home, home integration, and sibling relationship scores. This group represented 76% of the dataset.

The next largest group (n=22) was classified as "Newer, unrelated foster home with more resources", and was characterized by foster parents with less experience, who were most likely unrelated, and who had a higher income than the other groups. This group represented 13% of the dataset.

The last and smallest group (n=16) was likely to be related to highly experienced foster parents and to have lived in a home for the longest period of time of the three

groups. This group represented 10% of the dataset and was classified as: “Related, highly experienced longer term foster home.”

Table 4.3 Group Mean Values Based on Hierarchical Agglomerative Clustering

Group	Cluster or Group Size	Kinship Care	Living without Sibling	Months in Placement	Monthly Income (in $1,000)	Months as Foster Parent	Foster Parent Education (1-7 Scale)	Number of Children Fostered	Number Living in Home	Youth with Bio-Parent Contact	Home Integration Scale Score (1-10)	Youth and Parent Racially Matched	Sibling Relationship Scale Score (1-5)
Older Sibling Mean Values Per Group													
1	18	33%	28%	45.9	5.0	86.9	4.8	7.4	3.7	61%	9.4	67%	3.8
2	9	0%	44%	8.2	5.1	47.7	5.4	10.0	5.7	100%	8.0	67%	3.1
3	7	86%	0%	10.7	4.1	10.4	2.9	3.3	5.1	71%	9.0	71%	3.0
4	3	0%	0%	57.0	6.7	220.7	3.7	58.3	4.3	100%	6.5	33%	3.5
Younger Sibling Mean Values Per Group													
1	5	0%	40%	25.0	6.4	209.2	3.8	72.4	4.8	100%	7.8	40%	3.9
2	12	0%	58%	45.0	5.8	76.6	4.9	9.6	4.0	8%	8.4	75%	3.9
3	7	14%	43%	19.0	5.9	46.3	3.3	14.6	7.0	100%	9.5	57%	4.2
4	19	47%	11%	27.9	4.8	46.7	4.7	4.4	4.8	89%	8.6	63%	3.3
Non-Clustered													
OS	37	68%	24%	31.0	5.0	73.8	4.5	11.4	4.5	76%	8.7	65%	3.5
YS	43	77%	33%	30.9	5.5	73.9	4.4	15.4	4.9	70%	8.6	63%	3.7
OS Imputed Means													
1	124	28%	31%	28.7	5.1	77.3	4.4	13.8	4.4	66%	8.9	65%	3.7
2	36	86%	14%	46.3	3.8	27.2	2.6	4.9	5.3	50%	8.1	92%	3.4
3	1	0%	0%	72.0	5.0	360.0	3.0	300.0	5.0	0%	9.8	0%	3.7
4	1	0%	100%	2.0	5.0	26.0	2.0	23.0	25.0	100%	9.4	100%	3.7
YS Imputed Means													
1	124	42%	27%	24.3	4.8	67.5	4.3	12.6	4.1	63%	8.7	67%	3.6
2	22	23%	36%	11.0	6.5	27.8	3.6	7.3	8.0	82%	8.9	64%	3.9
3	16	50%	25%	114.6	4.6	209.4	3.1	56.2	4.5	50%	8.9	100%	3.6
4	1	0%	0%	72.0	4.0	360.0	3.0	300.0	5.0	0%	9.7	0%	4.1
Non Clustered imputed													
OS	162	41%	28%	32.7	4.8	67.6	4.0	13.6	4.7	62%	8.7	0.7	3.6
YS	163	40%	28%	31.7	5.0	77.9	4.1	18.0	4.6	64%	8.7	0.7	3.7

K-Means Analysis

A K-Means cluster analysis was then conducted with the same indicator variables. Based on the HACA results, four centroids were specified for the analyses. As with the HACA models, analyses were conducted with both the original dataset as well as the imputed complete dataset. The imputed dataset was then used to create groups that were used for group-to-group comparisons and subsequent analyses. Additional details of both datasets are outlined in Table 4.4 below.

Three viable groups were identified with the K-means method of clustering for the older siblings (n1=111, n2= 25, n3=25). The largest group was referred to as "New, racially matched foster parent with bio-parent contact." Compared to the other two groups, group members had the lowest average number of months in foster care, were the most likely to have contact with their biological parent and were more likely to be racially matched with their foster parent. The next group was identified as "Alone with an educated, experienced non-relative", and were characterized as having a low likelihood of being in kinship care and a higher likelihood of being without their sibling. In addition, they lived with an educated foster parent with substantial experience both in time fostering and number of children fostered. The final group was distinguished by the youth being likely to be in kinship care with their sibling for the longest period of time compared to the other groups. This group was referred to as "Long-term kinship care with sibling.

Table 4.4 Group Mean Values Based on K-Means Clustering

Group	Cluster or Group Size	Kinship Care	Living without Sibling	Months in Placement	Monthly Income (in $1,000)	Months as Foster Parent	Foster Parent Education (1-7 Scale)	Number of Children Fostered	Number Living in Home	Youth with Bio-Parent Contact	Home Integration Scale Score (1-10)	Youth and Parent Racially Matched	Sibling Relationship Scale Score (1-5)
Older Sibling Mean Values Per Group													
1	15	53%	27%	9.1	4.3	14.2	3.7	4.1	5.1	80%	8.8	67%	3.3
2	5	40%	0%	95.4	4.2	97.0	3.8	7.6	4.4	60%	9.5	60%	3.8
3	6	0%	17%	51.8	5.8	211	4.8	37.2	3.8	67%	8.0	67%	3.8
4	11	18%	36%	20.2	5.8	69.7	5.6	9.0	4.2	82%	8.6	64%	3.4
Younger Sibling Mean Values Per Group													
1	6	33%	17%	91.8	5.0	112	4.3	5.7	4.7	33%	8.3	83%	3.1
2	11	18%	27%	26.5	5.4	76.8	5.0	9.2	4.2	64%	8.8	73%	3.7
3	19	32%	37%	13.9	5.2	14.6	4.3	5.9	5.4	79%	8.6	58%	3.8
4	7	0%	43%	31.6	6.9	197	4.1	59.1	5.0	86%	8.3	43%	3.9
Non-Clustered Group Means													
OS	37	68%	24%	31.0	5.0	73.8	4.5	11.4	4.5	76%	8.7	65%	3.5
YS	43	77%	33%	30.9	5.5	73.9	4.4	15.4	4.9	70%	8.6	63%	3.7
Older Sibling Imputed Means													
1	111	44%	28%	12.0	4.9	31.0	4.0	6.0	5.0	68%	8.7	73%	3.6
2	1	0%	0%	72.0	5.0	360	3.0	300	5.0	0%	9.8	0%	3.7
3	25	4%	48%	33.1	5.0	197	4.8	41.2	4.0	56%	8.7	68%	4.0
4	25	64%	8%	123	4.2	89.4	3.3	8.4	4.4	48%	8.9	64%	3.7
Younger Sibling Imputed Means													
1	17	0%	35%	16.7	6.1	197	4.5	40.5	4.0	76%	9.0	41%	3.8
2	33	27%	30%	56.8	4.4	107	4.2	12.1	4.1	45%	8.8	70%	3.6
3	15	33%	40%	105	5.1	269	3.4	82.3	4.1	60%	9.0	80%	3.7
4	98	52%	24%	14.5	5.1	17.9	4.1	6.2	5.0	68%	8.6	72%	3.7
Non Clustered Imputed Group Means													
OS	162	41%	28%	32.7	4.8	67.6	4.0	13.6	4.7	62%	8.7	0.7	3.6
YS	163	40%	28%	31.7	5.0	77.9	4.1	18.0	4.6	64%	8.7	0.7	3.7

As for the younger sibling groups, all four groups had sufficient numbers to include in the analyses (n1=98, n2=15, n3= 33, n4=17). Compared to the other three groups, the largest group—identified as "New placement, new parent in a crowd"—was the most likely to live with their sibling in kinship care and to have been in care for the shortest period of time. They had a foster parent with the least amount of experience and the highest number of people in the home. They also had the lowest PHI score. The next group was called "Long-term, alone, matched and experienced foster parent. They were comparatively more likely to live without their sibling and to spend the longest time in placement. They had a less educated but highly experienced and racially matched foster parent. The third group was identified as "Poor, empty, isolated and conflicted", and was characterized as having the lowest level of resources, with the second fewest number of people in the home and the least amount of contact with biological parents in comparison to the other groups. They also had the lowest average score on the sibling relationship variable. Lastly, the fourth group was named "New mismatched strangers" and was distinguished as having all members living in stranger care, being in care for a relatively short amount of time, having the highest percentages of youth with contact with their biological parent, and having the lowest percentage of being racially matched with their foster parent compared to the other groups.

With respect to comparing cluster characteristics of the K-Means analyses to those created with the HACA analyses, there were few similarities. The specific variables that defined each group were generally distinct between the two clustering methods. The names suggest some of the noted differences. For the older siblings, the largest group determined with the HACA technique was known as "Alone with unrelated,

educated, experienced and resourced foster parents" as opposed to "New, racially matched foster parent with bio-parent contact" found with the K-means method; the difference suggests that the determining variables were placement with siblings, placement in kinship care, foster parent educational level, and monthly income level in the HACA method. With the K-means method, the variables that distinguished the group were time in placement, racial match, and contact with bio parent. The main similarities were found in the distribution of cases, with a large initial group followed by one or more much smaller group. This was the case with both the HACA and the K-Means methods.

Latent Class Analysis

Due to the large number of variables included in the model, there were a great number of potential marginal frequency patterns[1]. Specifically, with 12 dichotomous variables, there were over 4,000 possible response combinations. A total of 157 patterns

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[1] For the LCA, the college education variable was dichotomized to separate foster parents with any level of college education (OS=66.4%, YS=67.4%) from those parents with none. The months as foster parents variable was dichotomized at the median (Mdn=48 for both OS and YS), 48.4% and 48.6% of the primary foster parents reported to have fostered for 48 months or more for older and younger siblings respectively. A dichotomous variable assessing poverty level was created based on the 2010 poverty guidelines (Office of the Assistant Secretary for Planning and Evaluation, 2010). Original responses were recoded to the median of the response range (for example, a response of $2,000-$3,000 was recoded to $2,500) and used in conjunction with household size to determine if a foster home met criteria for federal level poverty. Among the foster parents of older siblings, 13.3% met criteria for poverty, and slightly fewer foster parents (11.2%) of younger siblings met criteria (with 12.3% of all foster parents falling in the poverty range). Positive Home Integration scores were dichotomized at the median of the total sample. Among the older siblings, 51.6% reported a positive home integration score of 9.18 or more. Among the younger siblings, 48.8% indicated a PHI score of 9.18 or better. Number of foster children fostered was dichotomized at the median (Mdn=5 for both OS and YS), which resulted in 56.2% and 55.4% of the primary foster parents reporting to have fostered at least 5 children for the older and younger siblings respectively. A dichotomous variable for number of household members was created, split at the median (Mdn=4 both OS and YS). For older siblings, 62.3% of foster homes had 4 or more children or adults, and 66.5% of younger sibling foster homes reported a household size greater than or equal to 4. Months lived in the home was split at the median (9 months for older siblings and 12 month for younger siblings). Among the older siblings, 54.7% had lived in their foster home for 9 months or more, 52.4% of the younger siblings lived in their foster home for 12 months or more. The SRQ was dichotomized at the median with 53.1% of older siblings indicating an SRQ score of 3.7 or better, and 52.2% of younger siblings reporting an SRQ score of 3.7 or better.

were found in the SIBS-FC older sibling dataset, 152 of which were unique and five shared by only two individuals. Similarly in the younger sibling dataset, there were a total of 157 different responses for the younger siblings with only five of those responses being shared. A table of marginal response proportions is included in the Appendix.

A one-class analysis was conducted to serve as a baseline model. Due to the small number of complete observations, only a two-class solution was able to be tested before running out of degrees of freedom. Models were re-run using the full dataset; a two-class solution for both the older and younger sibling groups had the lowest fit statistics with respect to the AIC and BIC, suggesting it as the best choice (see Table 4.6).

Table 4.6 Fit Statistics for LCA Models (Complete Dataset)

Older Siblings

Class	*N*	G^2	X^2	*df*	*AIC*	*BIC*
1	162	881.6	4344.49	150	2493.3	2530.35
2	162	763.97	3920.66	137	2401.668	2478.86
3	162	716.99	3639.21	124	2380.691	2498.02
4	162	677.71	2510.62	111	2367.404	2524.87

Younger Siblings

Class	*N*	G^2	X^2	*df*	*AIC*	*BIC*
1	163	859.93	4065.73	151	2483.12	2520.25
2	163	758.23	4474.86	138	2407.43	2484.78
3	163	708.92	4102.73	125	2384.12	2501.68
4	163	674.81	3196.06	112	2376.01	2533.76

For the older sibling LCA groups, Group 1 was referred to as "new, inexperienced, relative foster home." Members in this group were more likely to live in kinship care with their sibling, for less time, were less likely to be in poverty, and to be with more people living in the home. They had higher scores on the home integration scale, higher rates of being racially matched but lower sibling relationship scores. The

foster parents in this group had less experience and less education and had fostered fewer children. The second was referred to as "experienced, educated, non-relative foster home."

The younger siblings looked similar in terms of group differences. Group 1 was referred to as "Experienced stranger care with low resources." Compared to others, members of this group were more likely to be in kinship care and living with their sibling and to have in the home for less time. They were less likely to be in poverty and their foster parent had less experience, less education, and had fostered fewer children. The two groups were similar in terms of number of people living in the home, contact with their biological parents, home integration and sibling relationship scores. Group 2 was referred to as "new relative care with resources and company." Tables 4.7 and 4.8 show the prevalence rates of all variables for all groups.

Research Question 3

The third research question was addressed by exploring each variable within each group. This was done after assigning each participant to a type based on the three grouping methods, then examining the group means of each predictor variable. A 20% difference in group means (calculated by multiplying the lowest groups' mean scores by 1.2) was determined to be adequate to suggest substantive differences and identify the variables indicative of a foster home type. All items are noted in Tables 4.7 and 4.8.

Table 4.7 LCA Model for Older Siblings

Variables	*Latent Class*	
	1	2
Latent Class Prevalences	48.8%	51.2%
Proportions based on predicted group		
Living with a Relative		
Yes	70.9%	12.0%
No	29.1%	88.0%
Living Situation		
With Sibling	87.3%	57.8%
Apart from Sibling	12.7%	42.2%
Months lived in home w/ FP (median split,os=9,ys=12)		
Median or more	42.6%	54.7%
Below Median	57.4%	45.3%
Resources (poverty level)		
Yes	15.7%	11.1%
No	84.3%	88.9%
Months Foster Parenting (FP1experience) Median Split (48)		
Median or more	0.0%	72.9%
Below Median	100.0%	27.1%
Education Level of Foster Parent (College +)		
Median or more	48.5%	82.4%
Below Median	51.5%	17.6%
Total Number of Children Fostered by Primary FP Median Split (5)		
Median or more	36.7%	69.8%
Below Median	63.3%	30.2%
Number of Adults and Children in the household median split (4)		
Median or more	70.5%	84.0%
Below Median	29.5%	16.0%
Youth Contact with Bio Parent (any reported)		
Yes	62.0%	62.7%
No	38.0%	37.3%
Baseline Positive Home Integration Scale medain split (9.18)		
Median or more	59.2%	43.9%
Below Median	40.8%	56.1%
Racial Match (FP1 or FP2)		
Matched	87.5%	59.3%
Mis-Matched	12.5%	40.7%
Baseline Sibling Relationship Questionnaire median split (3.722)		
Median or more	41.8%	65.1%
Below Median	58.2%	34.9%

Table 4.8 LCA Model for Younger Siblings

Variables	*Latent Class*	
	1	2
Latent Class Prevalences	42.3%	57.6%
Proportions based on predicted class		
Living with a Relative		
Yes	15.9%	57.4%
No	84.1%	42.6%
Living Situation		
With Sibling	66.7%	75.5%
Apart from Sibling	33.3%	24.5%
Months lived in home w/ FP (median split,os=9,ys=12)		
Median or more	69.5%	40.2%
Below Median	30.5%	59.8%
Resources (poverty level)		
Yes	4.5%	15.9%
No	95.5%	84.1%
Months Foster Parenting (FP1experience) Median Split (48)		
Median or more	95.8%	0.0%
Below Median	4.2%	100.0%
Education Level of Foster Parent (College +)		
Median or more	80.6%	57.3%
Below Median	19.4%	42.7%
Total Number of Children Fostered by Primary FP Median Split (5)		
Median or more	80.0%	36.5%
Below Median	20.0%	63.5%
Number of Adults and Children in the household median split (4)		
Median or more	50.7%	78.3%
Below Median	49.3%	21.7%
Youth Contact with Bio Parent (any reported)		
Yes	62.3%	64.9%
No	37.7%	35.1%
Baseline Positive Home Integration Scale median split (9.18)		
Median or more	47.8%	49.0%
Below Median	52.2%	51.0%
Racial Match (FP1 or FP2)		
Matched	63.0%	72.9%
Mis-Matched	37.0%	27.2%
Baseline Sibling Relationship Questionnaire median split (3.722)		
Median or more	48.5%	47.9%
Below Median	51.5%	52.1%

For the HACA method, variables that had at least 20% different mean scores for the older siblings were as follows: kinship care, months in placement, monthly income,

months as a foster parent, foster parent education, number of children fostered, number living in home, racial match. For the younger siblings, the variables that fell within this parameter included: kinship care, living without their sibling, months in placement, foster parent education, number of children fostered, number living in the home, bio-parent contact, and racial match.

For the K-Means method, the variables included (for older siblings): kinship care, living without their sibling, months in placement, monthly income, months as a foster parent, foster parent education, number of children fostered, number living in the home, contact with bio parent, and racial match. For younger siblings, the variables included: kinship care, living without their sibling, months in placement, monthly income, months as foster parent, foster parent education, number of children fostered, number living in the home, contact with bio parent, and racial match.

For the LCA with older siblings, the indicator variables included: kinship care, living without their sibling, months as a foster parent, foster parent education, number of children fostered, racial match, and sibling relationship questionnaire score. The indicator variables for the younger sibling LCA were as follows: kinship care, months in placement, months as a foster parent, foster parent education, number of children fostered, and number living in the home.

Group names were roughly based on these observations. However, due to the high numbers of variables that fell within the ≥20% cutoff range, names were selected based on the most indicative 2-4 variables. The names are meant to help identify the group but are not intended to fully explain all the differences. See Tables 4.9 and 4.10 for names and mean values for each group.

Table 4.9 Group Numbers and Corresponding Names Used in HLM Analyses

Group Number	*Group Name*	*n*
Hierarchical Agglomerative Cluster Analysis (HACA)		
Older Siblings		
Group 1-Referent	"Alone with unrelated, educated, experienced and resourced foster parents"	124
Group 2	"Together with related, less educated, less experienced, less resourced foster parents"	36
Younger Siblings		
Group 1-Referent	"Higher educated, mid-level experienced foster parents"	124
Group 2	"Newer, unrelated foster home with resources"	22
Group 3	"Related, highly experienced, longer-term foster home"	16
K-Means Cluster Analysis		
Older Siblings		
Group 1-Referent	"New, racially matched foster parents with biological parent contact"	111
Group 2	"Alone with educated, experienced, non relative"	25
Group 3	"Long-term kinship care with sibling"	25
Younger Siblings		
Group 1-Referent	"New, mismatched stranger"	17
Group 2	"Poor, empty, isolated and conflicted"	33
Group 3	"Long-term, alone, matched and experienced foster parent"	15
Group 4	"New placement, new parent in a crowd"	98
Latent Class Analysis (LCA)		
Older Siblings		
Group 1-Referent	"New, inexperienced, relative foster home"	79
Group 2	"Experienced, educated, non-relative foster home"	83
Younger Siblings		
Group 1-Referent	"Experienced stranger care with low resources"	69
Group 2	"New relative care with resources and company"	94

Table 4.10 Group Numbers and Indicator Variable Means

Hierarchical Agglomerative Cluster Analysis (HACA)

		n	Kinship Care	Living w/o Sibling	Monthly Income	FP Education	Children Fostered
Older Siblings	Group 1-Referent	124	28%	31%	5.1	4.4	13.8
	Group 2	36	86%	14%	3.8	2.6	4.9
			Kinship Care	Months in Placement	Monthly Income	Months as FP	FP Education
Younger Siblings	Group 1-Referent	124	42%	24.3	4.8	67.5	4.3
	Group 2	22	23%	11.0	6.5	27.8	3.6
	Group 3	16	50%	114.6	4.6	209.4	3.1

K-Means Cluster Analysis

			Kinship Care	Living w/o Sibling	Months in Placement	Months as FP	FP Education
Older Siblings	Group 1-Referent	111	44%	28%	12.01	31.02	4.02
	Group 2	25	4%	48%	33.12	196.60	4.80
	Group 3	25	64%	8%	122.68	89.44	3.28
			Kinship Care	Living w/o Sibling	Monthly Income	Months in Placement	Months as FP
Younger Siblings	Group 1-Referent	98	52%	24%	5.06	14.54	17.94
	Group 2	15	33%	40%	5.13	105.20	268.93
	Group 3	33	27%	30%	4.36	56.82	107.48
	Group 4	17	0%	35%	6.06	16.71	197.47

Latent Class Analysis (LCA)

			Kinship Care	Living w/o Sibling	Months in Placement *	Months as FP*	FP Education *
Older Siblings	Group 1-Referent	79	70.9%	12.7%	42.6%	0.0%	48.5%
	Group 2	83	12.0%	42.2%	54.7%	72.9%	82.4%
			Kinship Care	Living w/o Sibling	Mos. As FP*	FP Education *	Children Fostered*
Younger Siblings	Group 1-Referent	69	15.9%	33.3%	95.8%	80.6%	80.0%
	Group 2	94	57.4%	24.5%	0.0%	57.3%	36.5%

** percentage above the median*

Table 4.10 Group Numbers and Indicator Variable Means Cont'd

Hierarchical Agglomerative Cluster Analysis (HACA)

		Months as FP
Older Siblings	Group 1-Referent	77.3
	Group 2	27.2

		Children Fostered	Number in Home	Contact with Bio P	Racial Match
Younger Siblings	Group 1-Referent	12.6	4.1	63%	67%
	Group 2	7.3	8.0	82%	64%
	Group 3	56.2	4.5	50%	100%

K-Means Cluster Analysis

		Children Fostered	Contact with Bio P	Racial Match
Older Siblings	Group 1-Referent	6.00	68%	73%
	Group 2	41.24	56%	68%
	Group 3	8.40	48%	64%

		Children Fostered	Number in Home	Contact with Bio P	PHI Scale	Racial Match	SRQ
Younger Siblings	Group 1-Referent	6.17	5.00	68%	8.62	72%	3.66
	Group 2	82.27	4.13	60%	9.01	80%	3.72
	Group 3	12.12	4.12	45%	8.81	70%	3.60
	Group 4	40.47	4.00	76%	9.03	41%	3.75

Latent Class Analysis (LCA)

		Children Fostered*	Number in Home*	PHI*	Racial Match	SRQ*
Older Siblings	Group 1-Referent	36.7%	70.5%	59.2%	87.5%	41.8%
	Group 2	69.8%	84.0%	43.9%	59.3%	65.1%

		Number in Home*
Younger Siblings	Group 1-Referent	50.7%
	Group 2	78.3%

** percentage above the median*

Research Question 4

For the fourth research question, the full dataset using multiple imputation was used. Group mean baseline scores of the CDI, CROPS, Hopelessness Scale, and CBCL (internalizing, externalizing, and total raw scores) were compared separately for the three types of grouping methods.

For the older siblings, baseline CDI scores and Hopelessness Scale scores were statistically different between HACA-formed groups. The group "living together with related, less educated, experienced, resourced foster parents" scored higher than the group that was "alone with unrelated, educated, experienced and resourced foster parents" on both measures. For the K-means groups, there was a trend-level difference in total CBCL scores while no other significant differences were found. For the LCA groups, internalizing, externalizing, and total CBCL scores between the two LCA groups were noted; the "new, inexperienced, relative foster home" group scored lower than the "experienced, educated, non-relative foster homes" on all three baseline measures.

With the younger siblings using the HACA method, CROPS scores were significantly different, with the "longer-term kinship care with sibling" group scoring higher than the other two groups. Significant differences were also found in the baseline externalizing and total CBCL scores between K-Means-formed groups. The "new placement, new parent in a crowd" group scored higher than the other groups on both measures. Similarly, a significant difference was found between the two LCA-formed groups, with the "new relative care with resources and company" scoring lower on both CBCL measures than the "experienced stranger care with lower resources" group. No

other significant differences were found. Mean baseline comparison details can be seen in the tables included in the appendix.

Research Question 5

Hierarchical linear models were conducted to answer the final research question. Time was centered at the final assessment point in order to interpret changes in estimated outcomes over time. Additionally, interacting group and time as an independent variable supported an analysis of differences between groups related to rate of change over time in outcomes. Results are organized by outcome variable in the following order: CDI, CROPS, Hopelessness Scale, CBCL total scores, and CBCL externalizing and internalizing subscales. Each outcome's results are then organized by grouping method (HACA, K-Means then LCA) and sibling order (older siblings followed by younger siblings). The following pattern was used to conduct HLM analyses for each outcome: an intercepts-only model was conducted first, followed by a model with group and treatment condition as predictor variables, and lastly a model with group, treatment, time, and the interaction term as predictors.

Children's Depression Index

HACA.

Older Siblings. These models had a high Intraclass Correlations (ICC= .55) due to the clustered nature of the scores nested within participants. The second model fit the data statistically significantly better than the intercepts-only model. As compared to the referent group (i.e., alone with unrelated, educated, experienced and better resourced foster parents), the second group (i.e., together with related, less educated, less experienced, and less resourced foster parents) scored significantly higher on estimated

CDI scores at baseline. The group variable accounted for a small amount of variance (pseudo-R^2=.03).

The final model suggested that, at the final wave of collected data, there was a general reduction in estimated CDI scores (month 18 = -.07, $p < .05$). Specifically, members of the second group (i.e., together with related, less educated, less experienced, and less resourced foster parents) decreased in CDI scores at a higher rate than the first group (groupXwave18 = -.14, $p < .05$).

Younger Siblings. Neither the second nor third models indicated any significant differences between the three groups in terms of estimated CDI scores. The only statistically significant independent variable was found with time (month 18 = -.09, $p < .01$), suggesting that all participants decreased in CDI scores over the course of the study.

K-means.

Older Siblings. There were no statistically significant differences in groups related to estimated CDI scores among the older siblings noted in the second or final statistical models. The final model suggested 3% of outcome variance was explained with the added predictor variables; although the model was significant as a whole (χ^2 = 11.99 $p < .05$), there were no interpretable results from the individual indicator variables.

Younger Siblings. Similarly, significant differences related to group membership were not found with respect to the CDI. The model was statistically significant despite the individual non-significant findings (χ^2 = 13.95, $p < .01$).

LCA.

Older Siblings. The first model produced an ICC of .55. The second model was not a significant improvement in fit when only group membership and treatment

conditions were included. The third model was a statistically significant improvement in fit and suggested that time was the only significant contributor to change in outcome (with a slight decrease in estimated CDI scores reported over time). Group membership was not statistically significant with regards to changes in estimated CDI values over time.

Younger Siblings. With respect to estimated CDI scores for the younger siblings, similar findings were noted, with an ICC of .50 and the CDI decreasing over time (month 18 = -.08, $p < .10$). There were no other significant findings. Group, treatment condition and time accounted for 1% of the variation in outcome.

Children's Report of Post-traumatic Symptoms (CROPS)

HACA.

Older Siblings. There were no significant group related findings for estimated CROPS scores for the older siblings. The final model suggested that time was the only significant predictor of estimated CROPS scores (month 18 = -.22, $p < .05$) and fit the data significantly better than the intercepts-only model ($\chi^2 = 40.42$, $p < .01$). Time explained 4% of outcome variance.

Younger Siblings. Group differences were found in estimated CROPS scores for younger siblings in the second model ($\chi^2 = 8.57$, $p < .05$; pseudo-$R^2 = .03$). Group three (i.e., related, highly experienced, longer-term foster home) had significantly higher estimated CROPS scores than the referent group (i.e., higher educated, mid-level experienced foster parents; $\gamma 02 = 5.76$, SE = 2.03, $p < .05$). The statistical significance of the group's impact diminished to a trend level in the third model but maintained the higher estimated CROPS score among this group ($\gamma 02 = 4.89$, SE = 2.52, $p < .10$). Time

was the only statistically significant predictor variable (month 18 = -23, SE = .05, $p < .01$) in the final model. This model accounted for 6% of outcome variance (pseudo-R^2 = .06, $\chi^2 = 33.92$, $p < .01$).

K-Means.

Older Siblings. Changes in estimated CROPS scores among the older siblings were predicted only by time in the third model (month18 = -.21, $p < .05$). The model as a whole accounted for 3% of the variance in estimated CROPS scores and was statistically significant ($\chi^2 = 39.79$, $p < .01$).

Younger Siblings. Similar to the older siblings, younger siblings' estimated CROPS scores were predicted only by time (Month18 = -.26, $p < .01$), with the model as a whole predicting 4% of variance in estimated CROPS scores. The model was statistically significant ($\chi^2 = 33.93$, $p < .01$).

LCA.

Older Siblings. Similar to the K-means results, time was the only significant predictor of estimated CROPS scores using the LCA grouping method (Month18=-.19, $p < .01$). Group membership was not statistically significant. The model explained a small proportion of outcome variance (pseudo-R^2=.04), although the model as a whole was statistically significant (χ^2= 41.04, p<.01).

Younger Siblings. Time was also the only significant predictor of estimated CROPS scores for the younger siblings, with an average decline of .20 points (Month18=-.2, p<.01) at the final time point. The model as a whole was statistically significant (χ^2=34.06, p<.01) and explained 4% of the variance in outcome.

Hopelessness Scale Score

HACA.

Older Siblings. The second model for estimated Hopelessness scale scores suggested that group two (i.e., together with related, less educated, less experienced, and less resourced foster parents) had higher scores (Group2 = 2.81, SE = 1.09, $p < .05$) than the referent group (i.e., alone with unrelated, educated, experienced, and better resourced foster parents). This effect disappeared when time and the interaction of time and group was entered into the model. The interaction term was statistically significant in the final model, suggesting that members of group two tended to reduce estimated Hopelessness scale scores over time at a higher rate (γ 04 = -.17, SE = .08, $p < .05$) than the referent group. The model as a whole was statistically significant and predicted 4% of variance in the Hopelessness scale scores ($\chi^2 = 7.31$, $p < .05$, pseudo-R^2 = .04).

Younger Siblings. A trend-level difference was found by groups in the final model for estimated Hopelessness scale scores. Group two (i.e., newer, unrelated foster home with resources) had higher estimated Hopelessness Scale scores (Group2 = 3.09, SE = 1.73, $p < .10$) than the referent group (i.e., higher educated, mid-level experienced foster parents) and an increase in hopelessness over time (Group2*Month18 = .32, SE = .11, $p < .01$). The model also suggested that time was significant predictor of reduced estimated hopelessness scale scores (Month18 = -.19, SE = .04, $p < .01$). The model accounted for 3% of variance ($\chi^2 = 33.92$, $p < .01$, pseudo-R^2 = .03).

K-Means.

Older Siblings. There were no statistically significant predictors in any of the models related to estimated Hopelessness Scale scores for older siblings. There was a trend-level finding suggesting that time reduced estimated Hopelessness Scale scores

marginally (Month18 = -.16, $p < .10$). The model, however, was not statistically significant ($\chi^2 = 4.65$, ns).

Younger Siblings. Estimated Hopelessness Scale scores among the younger siblings were significant in the final model. Group four (i.e., new, mismatched stranger) reported higher estimated Hopelessness Scale scores (Group4 = 3.76, $p < .10$) as compared to the referent group (i.e., new placement, new parent in a crowd), although the findings were only at the trend level. Time was statistically significant ($\gamma 05 = -.15$, $p < .01$) as was the model as a whole ($\chi^2 = 16.06$, $p < .01$). However, the model explained only 3% of the outcome variance.

LCA.

Older Siblings. For the LCA models, estimated Hopelessness Scale scores were predicted only by time in the final model (Month18=-.09, $p<.10$). Results suggested an overall decline in estimated Hopelessness Scale scores of a .09-point decline (though the statistical significance was only at the trend level). The model, however, was not statistically significant as a whole.

Younger Siblings. Among the younger siblings, time was the only significant predictor of estimated Hopelessness Scale scores (Month18=-.16, $p<.05$). The model as a whole was statistically significant ($\chi^2 = 13.05$, $p<.01$).

Children's Behavior Checklist Total Raw Scores

HACA.

Older Siblings. There were no statistically significant indicator variables for estimated CBCL total raw scores for the older siblings. The third model explained 2% of variance and was statistically significant nonetheless ($\chi^2 = 7.5$, $p < .05$).

Younger Siblings. Similarly, there were no statistically significant predictor variables in any of the models for estimated CBCL Total scores for the younger siblings. Neither of the comparison models was statistically significant as a whole (χ^2 = 3.91, ns; pseudo-R^2 = .01).

K-Means.

Older Siblings. There were no statistically significant predictive variables in the models predicting estimated CBCL total raw scores for older siblings using the K-Means method. The model as a whole was statistically significant and predicted 3% of variance (χ^2 = 7.89, p<.05), however.

Younger Siblings. For younger siblings, group membership was a statistically significant predictor of estimated CBCL total raw scores in the final model. Compared to the referent group (i.e., new, mismatched stranger), all three groups had higher estimated total CBCL raw scores. Group two (i.e., poor, empty, isolated and conflicted) scored highest (Group2 = 20.59, p < .05); and both group three (i.e., long-term, alone, matched, and experienced foster parent) and group four (i.e., new placement, new parent in a crowd) scored similarly elevated averages (Group3 = 16.23, p < .05 and Group4 = 18.07, p < .05 respectively). The second model as a whole was statistically significant, predicting 6% of variance (χ^2 = 12.96, p<.05); in contrast, while the third model was not statistically significantly different from the second as a whole (χ^2 = 5.4, ns), it explained more outcome variance and was statistically different then the intercepts-only model (χ^2 = 18.36, p < .05).

LCA.

Older Siblings. Among the older siblings, group membership was a statistically significant predictor of estimated CBCL total raw score. Group two (i.e., experienced, educated, non-relative foster home) had a significantly higher total CBCL score (Group2 = 12.51, SE = 5.24, $p < .05$) than the referent group (i.e,. new, inexperienced, relative foster home). The model as a whole explained approximately 7% of the variance and was statistically significant ($\chi^2 = 6.69$, $p<.05$).

Younger Siblings. In the second model, group was a statistically significant predictor of estimated CBCL total raw scores for younger siblings with the LCA method. Group two (i.e., new relative care with more resources and company) had lower estimated total CBCL raw scores (Group2 = -17.17, SE = 4.65, $p<.01$). No other predictor variables were significant. The second model was statistically significant as a whole ($\chi^2 = 13.88$, $p<.05$) and predicted 7% of variance, whereas the third model did not significantly improve the fit ($\chi^2 = 1.82$, ns). Group membership remained a statistically significant predictor in the final model as well ($\gamma 01 = -17.08$, SE = 5.44, $p<01$).

Children's Behavior Checklist Subscales (Internalizing and Externalizing)

HACA.

Older Siblings. The final model suggests that group was a trend-level significant predictor of estimated CBCL Internalizing scale raw scores. Group two (i.e., together with related, less educated, less experienced, and less resourced foster parents) had lower estimated CBCL Internalizing scale scores than the referent group (i.e., alone with unrelated, educated, experienced, and better resourced foster parents; Group2 = -2.86, SE = 1.66, $p < .10$)). Group interaction with time was also a statistically significant predictor

of estimated CBCL Internalizing scale raw scores (Group2*Month18 = -.20, SE = .09, p < .05), suggesting that group two reduced estimated internalizing scale scores more than the referent group. The third model was statistically significant and predicted 5% of outcome variance (χ^2 = 9.65, p < .05, pseudo-R^2 = .01).

The models predicting estimated CBCL Externalizing scale raw scores contained no statistically significant predictor variables. The final model as a whole was marginally significant (χ^2 = 5.64, p < .10).

Younger Siblings. For the younger siblings, the final model predicted only 1% of the variance in estimated CBCL Internalizing Scale raw scores and was only marginally significant (χ^2 = 6.61, p < .10; pseudo-R^2 = .01). Time was marginally significant and suggested that estimated internalizing scale scores decreased over time (Month18 = -.07, SE = .04, p < .10).

As with the older siblings, no models contained statistically significant predictor variables of estimated CBCL Externalizing scale raw scores. The final model as a whole was not statistically significant or even marginally significant (χ^2 = .78, ns).

K-Means.

Older Siblings. There were no statistically significant predictor variables or whole models for estimated CBCL Internalizing scale or Externalizing scale raw scores for the older siblings.

Younger Siblings. For younger siblings, the final model suggested that group was a statistically significant predictor of estimated CBCL Internalizing Scale raw scores. Group two (i.e., poor, empty, isolated, and conflicted) had higher estimated internalizing scores (Group2 = 6.32, SE = 2.62, p <.05) compared to the referent group

(i.e., new, mismatched stranger). Group three (i.e., long-term, alone, matched, and experienced foster parent) also scored marginally higher than the referent group (Group3 = 3.41, SE = 1.78, $p < .05$) on estimated internalizing scale scores. Time was significantly predictive of internalizing scores (Month18 = -.08, SE = .05, $p < .05$) and the final model as a whole was statistically significant ($\chi^2 = 10.29$, $p < .05$) and predicted 4% of outcome variance.

As for estimated CBCL Externalizing scale raw scores among the younger siblings, the final model suggested that group was a statistically significant predictor. Group three and group four (i.e. new placement, new parent in a crowd) both had significantly higher estimated externalizing scores than the referent group (Group3 = 4.89, SE = 2.42, $p <.05$ and Group4 = 6.82, SE = 3.07, $p < .05$ respectively). The final model as a whole was statistically significant ($\chi^2 = 15.48$, $p < .05$) and predicted 6% of outcome variance.

LCA.

Older Siblings. The second model suggests that LCA group is a statistically significant predictor of estimated CBCL Internalizing Scale raw scores for older siblings (Group2 = 2.58, SE = 1.1, $p<.05$). Group two (i.e., experienced, educated, non-relative foster home) had higher estimated Internalizing scale scores as compared to the referent group (i.e., new, inexperienced, relative foster home). The second model was marginally significant ($\chi^2 = 5.89$, $p < .10$). The final model had a slightly better fit to the data ($\chi^2 = 5.21$, $p < .10$) but yielded no statistically significant predictor variables.

For estimated CBCL Externalizing Scale raw scores, the second model suggested that group was a statistically significant predictor (Group2 = 4.77, SE = 1.74, $p < .05$).

Group two had higher levels of externalizing raw scores than the referent group. The second model was statistically significant as a whole ($\chi^2 = 8.48$, $p < .05$). The final model significantly improved the fit to the data, though the pseudo-R^2 was the same with both models (pseudo-$R^2 = .04$) and had no statistically significant predictor variables.

Younger Siblings. For the younger siblings, in the second model, group was suggested to be a statistically significant predictor variable for both estimated CBCL Internalizing and Externalizing Scale raw scores. For both outcomes, group two (i.e., new relative care with resources and company) was shown to have lower estimated Internalizing scores (Group2 = -2.76, SE 1.13, $p < .05$) and Externalizing scores (Group2 = -5.17, SE = 1.60, $p < .01$). In both cases, the second model improved the model fit to the data ($\chi^2 = 5.94$, $p < .10$ and $\chi^2 = 10.64$, $p < .01$ for internalizing and externalizing respectively). The models explained 3% and 5% of the outcome variance for internalizing and externalizing subscales respectively. The final models did not significantly improve the fit of the model to the data.

Summary of Statistically Significant Findings

HACA

The older siblings found that the comparison group/group 2 (together with related, less educated, less experienced, less resourced foster parents) interaction term (time by group) was lower than the referent group (alone with unrelated, educated, experienced and resourced foster parents), suggesting that group 2 had a more negative slope in terms of the depression index (time was significant for all participants). This was also the case with the Hopelessness scale, with a negative slope in the group 2 by time interaction term. There was a trend-level negative difference with the comparison group as well as a

negative difference in slope, illustrated by the interaction term with CBCL internalizing raw scores.

The younger sibling group was broken into three distinct groups. A trend-level statistically significant difference was found in the CROPS outcome model and the Hopelessness scale outcomes, with group 3 (related, highly experienced, longer-term foster home) scoring higher than the referent group (higher educated, mid-level experienced foster parents) on both outcomes. No other outcomes seemed to be related to group membership based on the hierarchical agglomerative cluster analysis method.

K-Means

There were no statistically significant findings related to group membership among the older sibling groups clustered with K-means cluster analysis. As for the younger sibling groups, there was a trend-level finding for the Hopelessness scale as an outcome, with group 4 (new placement, new parent in a crowd) scoring higher than the referent group (new, mismatched stranger). All three groups were significantly higher than the referent group on the CBCL total raw score as the outcome. However, only one statistically significant difference was found between group 2 (poor, empty, isolated and conflicted) and the referent group for internalizing raw scores. There was a trend-level difference found in group 3 (long-term, alone, matched and experienced foster parent) for internalizing symptoms as the outcome. Finally, there were statistically significant differences in groups 3 and 4 scoring higher than the referent group on the externalizing subscale.

LCA

There was one statistically significant older sibling group difference that was found after grouping homes using LCA. It suggested that the comparison group (experienced, educated, non-relative foster home) reported higher scores on the CBCL total score at the final assessment wave than the referent group.

Group membership was also significant in the models with the younger siblings. The comparison group (new relative care with resources and company), which resembles the referent group in the older sibling models, reported lower scores on the raw total of the CBCL at the final wave. In addition, the subscales of the CBCL at the final wave of assessment were significantly different, with the referent group scoring higher on the internalizing and externalizing symptoms scales.

Chapter 5: Discussion

The substantive question that motivated the study was how a foster youth's mental health might be impacted by the kind of foster home the youth lives in. To explore this overarching question, the study was organized into specific research questions that can be divided into two subsections. The first three questions sought to determine if a typology of foster homes could be identified with the available data. The last two questions examined how members of those types of foster homes compared to each other in terms of measured mental health outcomes.

This chapter is divided into five sections. The first section provides a brief summary of the methods and results detailed in previous chapters. The second section offers a summary of key findings as they relate to theory and prior research. The third section identifies study limitations, which is followed by a section of implications for future research and practice, programming, and policies**.** The chapter concludes with final reflections on what can be learned for child welfare researchers and practitioners.

Summary of Results

Methodology

Three cluster analytical approaches—namely, hierarchical agglomerative cluster analysis (HACA), K-means cluster analysis (K-means), and latent class analysis (LCA)—supported the development of a theory-informed model of foster home typologies. A hypothetical model derived from prior literature on social learning theory and child welfare research guided the selection of available variables from the SIBS-FC dataset. Variables were converted to the appropriate form (continuous or categorical) to suit each method. Clusters were produced separately for older and younger sibling data subsets,

and the process was repeated after completing the datasets with multiple imputation. In examining results, variables were determined to be indicative of a type if at least 20% difference was noted between one or more of the others.

Cases were then assigned to their respective types and outcome measures were compared using ANOVA for baseline measures. Hierarchical linear models (HLM) were used with youth as the grouping factor to account for multiple assessment waves for each participant. Final assessment outcomes and rate of change between foster home types were estimated via HLM.

Results for Questions 1-3

Foster home types were found with all three clustering methods. The first run (cases with missing data removed) produced four clusters with both HACA and K-means analyses and two classes with LCA. With the complete dataset, some of the clusters dropped to n=1 and were removed for subsequent analyses. The final tally for the number of distinct clusters identified using each analytic method is as follows: HACA OS=2, HACA YS=3, K-means OS=3, K-means YS= 4, and LCA OS/YS=2. Seven of the 11 variables were found to be indicative of type for both the older and younger siblings. Names were given each type based on the most distinguishing variables of each group and are included in Tables 5.1-5.6 with measured values for all variables.

Results for Questions 4 & 5

Tables 5.1 through 5.6 summarize results for the fourth and fifth research questions. Different clustering analytic methods supported the identification of group-based differences in key outcome measures for older and younger siblings. For older siblings, significant differences between groups were found for the CDI and

Hopelessness scale using the HACA groupings. Using the K-means groupings, there was a trend-level difference in the CBCL total score. With the LCA, significant group differences were found in the CBCL internalizing, externalizing, and total scores.

Turning to the younger siblings, CROPS scores were significantly different using the HACA groups. With the k-means groupings, significant differences were found for the CBCL internalizing and total scores. With the LCA groups, significant differences were found for CBCL externalizing and total scores, and a trend-level difference was identified in the CBCL internalizing subscale.

To explore such differences and changes over time, HLM were conducted with youth as the level two grouping variable and time centered at the final survey point for older and younger siblings. For the older siblings, group differences and different rates of change were found for the CDI, Hopelessness scale, and CBCL Internalizing scale. No group impact was found with the K-means groups. With the LCA groups, differences were found with the CBCL total scores and both the internalizing and externalizing subscales.

For the younger siblings, there were trend-level differences found with CROPS scores and Hopelessness scores, and a difference was seen in slope for Hopelessness scores with groups derived from the HACA method. For the K-means groups, the Hopelessness scale and the CBCL total and internalizing and externalizing subscales exhibited significant group differences. The CBCL internalizing scale had a difference in slope for one group. The CBCL total scores and both subscales were different with the LCA groups as well.

Table 5.1 Hierarchical Agglomerative Cluster Analysis - Older Siblings

Defining variables	Alone with unrelated, educated, experienced and resourced foster parent (n=124)	Together with related, less educated, less experienced, less resourced foster parent (n=36)
Kinship Care	28%	86%
Living without sibling	31%	14%
Income	5.1	3.8
FP Education	4.4	2.6
Children Fostered	13.8	4.9
Months as Foster Parent	77.3	27.2
Significant baseline differences		
CDI*	7.2	11.43
Hopelessness*	11.43	33.86
HLM models		
Children's Depression Index		
Group X Time		-.14*
Group (in model 2)		2.81*
Hopelessness Scale		
Group X Time		-.17*
Group (in model 2)		2.81*
CBCL Internalizing Subscale		
Group X Time		-.20*
Group		-2.86†

*Note: † p<.10, *p<.05, **p<.01*

Table 5.2 Hierarchical Agglomerative Cluster Analysis - Younger Siblings

Defining variables	Higher educated, mid-level experienced foster parent home n=122	Newer, unrelated foster home with resources n=22	Related, highly experienced, longer-term foster home n=16
Kinship Care	42%	23%	50%
Month in Placement	24.3	11	114.6
Income	4.8	6.5	4.6
Months as FP	67.5	27.8	209.4
FP Ed	4.3	3.6	3.1
Kids Fped	12.6	7.3	56.2
Number in Home	4.1	8	4.5
Contact with bio	63%	82%	50%
Race Match	67%	64%	100%
Significant baseline difference			
CROPS*	20.34	22.33	26.6
HLM models			
CROPS			
Group			4.89†
Hopelessness			
Group		3.09†	
Group X Time		.32***	

*Note: † p<.10, *p<.05, **p<.01, ***p<.001*

Table 5.3 K-means Cluster Analysis - Older Siblings

	New, racially matched foster parent with bio parent contact	Alone with educated, experienced non-relative	Long-term, kinship care with sibling
Defining variables	n=111	n=25	n=25
Kinship Care	44%	4%	64%
Living without Sibling	28%	48%	8%
Months in Placement	12.01	33.12	122.68
Months as Foster Parent	31.02	196.6	89.44
Foster Parent Education	4.02	4.8	3.28
Children Fostered	6	41.24	8.4
Contact with Bio Parent	0.68	0.56	0.48
Racial Match	0.73	0.68	0.64
Significant baseline differences			
CBCL Total Score†	51.65	46.71	63.33
HLM models	N/A	N/A	N/A

*Note: † p<.10, *p<.05, **p<.01, ***p<.001*

Group 1 identified as: New, racially matched foster parent with bio parent contact

Group 2 identified as: Alone with educated, experienced non-relative

Group 3 identified as: Long-term, kinship care with sibling

Table 5.4 K-means Cluster Analysis - Younger Siblings

Defining Variables	New placement, new parent in a crowd n=98	Long-term, alone, matched and experienced foster parent n=15	Poor, empty, isolated, conflicted n=33	New, mismatched stranger n=17
Kinship Care	52%	33%	27%	0%
Living without Sibling	24%	40%	30%	35%
Income	5.06	5.13	4.36	6.06
Months in Placement	14.54	105.2	56.82	16.71
Months as Foster Parent	17.94	268.93	107.48	197.47
Children Fostered	6.17	82.27	12.12	40.47
Number in Home	5	4.13	4.12	4
Contact with Bio Parent	0.68	0.6	0.45	0.76
Home Integration Score	8.62	9.01	8.81	9.03
Racial Match	0.72	0.8	0.7	0.41
Sibling Relationship Score	3.66	3.72	3.6	3.75
Significant Baseline differences				
CBCL Externalizing*	12.05	13.31	17.33	22.24
CBCL Total*	39.71	44.62	56.42	64.71
HLM models				
Hopelessness				
Group				3.76†
CBCL Total Score				
Group		20.59*	16.23*	18.07*
CBCL Internalizing				
Group		6.32*	3.41†	
Group X Time		.31*		
CBCL Externalizing				
Group			4.89*	6.82*

*Note: † p<.10, *p<.05, **p<.01, ***p<.001*

Table 5.5 Latent Class Analysis -Older Siblings

Defining variables	New, inexperienced, relative foster home n=79	Experienced, educated, non-relative foster home n=83
Kinship Care	70.9%	12.0%
Living without Sibling	12.7%	42.2%
Months in Placement	42.6%	54.7%
Months as Foster Parent	0.0%	72.9%
Foster Parent Education	48.5%	82.4%
Children Fostered	36.7%	69.8%
Number in Home	70.5%	84.0%
Home Integration Score	59.2%	43.9%
Racial Match	87.5%	59.3%
Sibling Relationship Score	41.8%	65.1%
Significant baseline differences		
CBCL Internalizing*	10.33	13.47
CBCL Externalizing*	13.17	18.99
CBCL Total Score*	40.19	58.73
HLM models		
CBCL Internalizing		
Group (model 2)		2.58*
CBCL Externalizing		
Group (model 2)		4.77*
CBCL Total		
Group		12.51*
CBCL Externalizing*		

*Note: † p<.10, *p<.05, **p<.01, ***p<.001;*
(Percentages refer to percent of group scoring above the median variable value of the original dataset)

Table 5.6 Latent Class Analysis -Younger Siblings

	Experienced, educated strangr	New relative care with company
Defining variables	n=69	n=94
Kinship Care	15.9%	57.4%
Living without Sibling	33.0%	24.5%
Months as Foster Parent	95.8%	0.0%
Foster Parent Education	80.6%	57.3%
Children Fostered	80.0%	36.5%
Number in Home	50.7%	78.3%
Significant baseline differences		
CBCL Internalizing*	11.55	9.25
CBCL Externalizing*	18.14	11.64
CBCL Total*	57.59	18.18
HLM models		
CBCL Internalizing		
Group		-.17.08*
CBCL Externalizing		
Group		-3.41*
CBCL Total		
Group		-4.65*

*Note: † p<.10, *p<.05, **p<.01, ***p<.001;*
(Percentages refer to percent of group scoring above the median variable value of the original dataset)

Situating Key Findings Vis-a-Vis the Empirical Literature

We now situate the main results in relation to the extant literature. In particular, key findings are discussed as they relate to the central theoretical and empirical preoccupations of child welfare researchers focused on the articulation of foster home living situations and their consequences for youth mental health outcomes.

Typologies of Foster Homes (Research Questions 1-3)

A primary and important finding of this study is the successful identification of a typology of foster homes. This study identified that foster homes could be distinguished based on a standard set of indicators that are commonly noted as essential from the perspective of child welfare officials (notably, foster parent certifiers and child welfare caseworkers) and mental health professionals such as clinical social workers. Specifically, defining variables included whether a youth was placed with kin, whether a youth was living with one or more siblings, levels of foster parent education and income, number of children who had been fostered as of baseline, and level of experience as a foster parent.

These typologies underscore the importance of (a) what variables are included in the clustering models and (b) what type of method is used to determine how the cases cluster. Different clustering algorithms group cases in different ways, resulting in group characteristics that vary from one method to another. To illustrate this point with the older sibling dataset, note that the largest group identified by using the HACA method was named: "Alone with unrelated, educated, experienced and resourced foster parents." When those same data were analyzed with the K-means algorithm, the largest group was identified as: "New, racially matched foster parents with bio parent contact." This suggests that the distinguishing features for the HACA method included placement in kinship care, living with siblings, and foster parent education, experience, and resources. In contrast, the K-means method found racial match and higher levels of biological parent contact as more differentiating variables. The K-means group similarly

had a substantial proportion in kinship care who were also living with a sibling but not as distinctly as was found using the HACA method.

The identification of different typologies provides a starting point from which to build a more refined understanding of the diverse contexts of foster homes. Although research efforts to typify elements of foster homes are not recent, the empirical effort to find a more global typology regarding quality is. Specifically, Zinn (2010) examined whether "kinship foster families [could] be meaningfully distinguished from one another based on family structure and household composition (p. 327)" with latent class analysis. In addition, García-Martín and colleagues (2014) used K-means cluster analysis to "determine whether distinct profiles of foster placements [could] be identified on the basis of key variables…."(p. 2579). However, no further studies have sought to typologize foster homes.

As it pertains to the third research question (concerning identifying types), most of the variables measured and used in identifying homes were indicative of foster home quality based on the makeup of the clusters. Kinship placement, living away from a sibling, and length of stay were the strongest indicators of the group. This underscores the value of research that has relied on kinship and sibling togetherness. While these variables are necessary, they are far from sufficient in distinguishing between groups.

In addition, measures of parental education and experience, monthly income, number of people in the home, bio parent contact, racial match, and sibling relationship were all found to distinguish foster home type. Home integration scores were quite high across the board; while there was differentiation, it was not a statistically sufficient criterion to be included as an indicator variable. Table 5.7 illustrated the variables that

were indicative of each group. Interestingly, home integration was correlated at the bivariate level with four of the six outcome measures but did not define home type.

Table 5.7 Indicator Variables by Method and Dataset

	Kinship Care	Living Without Sibling	Months in Placement	Monthly Income	Months as FP	FP Education	# of Children Fostered	# Living in Home	Bioparent Contact	Home Integration	Racial Match	Sibling Relation Score
HACA OS	✓		✓	✓		✓	✓	✓			✓	
HACA YS	✓	✓	✓			✓	✓	✓	✓		✓	
K-Means OS	✓	✓	✓	✓	✓	✓	✓	✓	✓		✓	
K-Means YS	✓	✓	✓	✓	✓	✓	✓	✓	✓		✓	
LCA OS	✓	✓			✓	✓	✓				✓	✓
LCA YS	✓		✓		✓	✓	✓	✓				

Note: ✓=Variable with at least 20% difference between groups

Finally, the input of the youth themselves contributed only in the instance of the LCA model with older siblings. This finding was surprising, given that prior research and theory have suggested that youth perspectives are essential for advancing understanding of the foster home environment (Chambers, R. et.al., 2020; Randle, 2013).

However, the current research suggests that indicator variables based on parents may be adequate in assessing a foster home prior to placement (as there will have been no youth available to survey). It seems logical that this finding may have resulted due to the mathematics of the analyses. There was a much higher proportion of parent measures used than youth measures in the clustering algorithms. In addition, the youth measures had scores with less variability, which most likely impacted how well the youth measures could be used to distinguish one type from another. Yet it would be an oversight to assume that foster home quality could be appropriately assessed without youth

perspective. Furthermore, some additional methods (proposed in the next section) require youth outcomes (e.g., CART analysis) when classifying foster homes.

Foster Home Types and Mental Health Outcomes (Research Questions 4 & 5)

Findings related to the impact of group membership on mental health were mixed with respect to confirming and contradicting previous research. For half of the groups, baseline and/or final assessment points found that groups with a higher likelihood of being in kinship care and with their sibling tended to score significantly lower on the CBCL scales (as can be seen in Tables 5.4, 5.5 and 5.6). This finding supports other research which has found inverse relationships between negative outcomes and kinship care with siblings. However, for the other half of the typologies, groups with the highest likelihood of being in kinship care with their sibling scored higher on CDI, the Hopelessness scale, and CROPS (as suggested by Tables 5.1 and 5.3). In one case, kinship care seemed to be related to higher CROPS scores but lower hopelessness (see Table 5.2). This finding thus contradicts some prior studies (Holtan, Rønning, Handegård & Sourander, 2005; Garcia et al., 2014) while supporting other research (Shore, Sim, Le Prohn & Keller, 2002; Hegar & Rosenthal, 2011).

We note that as the groups were not uniform, it is impossible to declaratively identify the characteristics associated with high-quality foster homes. Yet we suggest that kinship care and sibling togetherness did prove to be important characteristics. However, if foster parents within those homes were less well-educated and less well-resourced, then the influence of those foster home characteristics tended to be diminished. This tentative finding is corroborated by prior studies identifying the importance of foster parent material and social resources, separate from the traditional

benefit of kinship and sibling placement (Rhodes, Orme, & Cox, 2003). Racial match was another factor that studies have suggested contributes to better youth and service outcomes. However, when coupled with excessively long placement stay, the current study found that the influence of racial match on higher internalizing scores was insignificant.

As far as change over time, only three of the six typologies showed differences in outcome scores over time. Kinship care and sibling togetherness appeared to be protective as CDI, Hopelessness and CBCL Internalizing scores declined over time for the group with higher prevalence of kinship care and sibling togetherness as shown in Table 5.1. In another group (see Table 5.2), relatively new placements into stranger care increased in hopelessness over the 18-month period of the study. Table 5.4 identified a group that had been in stranger care for an extended time period also increased their internalizing scores despite protective characteristics including resources, foster parent experience and high PHI. Finally, three groups exhibited change over time (as exhibited in the HACA OS, K-means YS and LCA OS results). In all three instances, the change was favorable towards the group with higher likelihood of being in kinship care.

Limitations

These main results and proposed key findings should be understood as reflecting a set of study limitations. First, there were several variables with a substantial amount of missing data. In order to conduct all planned analyses, it was necessary to complete the dataset with multiple imputation. Although this introduced potential errors in drawing conclusions from any finding, it can be considered a reasonable tradeoff for an exploratory analysis.

Second, data that measured environmental characteristics (i.e., the HOME measure) in a much more granular fashion were not available. This limited the potential to validate these findings with existing research aimed at understanding home environments in other fields of social research.

Third, the use of LCA required data reduction in the form of dichotomizing all continuous variables in the dataset. This removed some of the nuances that may have otherwise been identified in the types produced by the analyses. Furthermore, results were complicated by dichotomizing the continuous variables at the median calculated from the original (non-imputed) dataset. Consequently, results of some analyses using the complete dataset were unclear (e.g., with both groups having a high probability of being above the median on a given variable).

Fourth, while LCA requires that the measured variables be independent of each other, independence was not possible for the variables selected for this study. Muthen describes this assumption of local independence as a key component to being able to claim that the latent class is what is driving the observations seen in the variables (Muthen, 2001). This study found significant correlations between the manifest variables, suggesting that LCA results should be interpreted with caution.

Fifth, the HLM were limited to comparisons made only between the comparison groups and the referent group. In models with multiple comparison groups, the comparison groups were not compared to each other. This decision was made due to the referent group being much larger than the comparison groups and thus serving as an acceptable "baseline" against which the others were compared. Omitting additional

comparisons of the smaller groups to each other created more parsimonious models but may have missed important between-group distinctions.

Finally, the sample cannot be generalized to a population of foster youth outside of metropolitan areas of the Pacific Northwest. This region has a unique identity; and while some characteristics of foster youth are consistent throughout the U.S., not all findings may translate to areas outside of this specific region.

Implications for Research and Practice, Programming, and Policies

With these study limitations in mind, a set of implications for research and practice, programming, and policies are presented. Specific implications for research concern (a) the need for refinements in typologizing foster home settings (corresponding with Research Questions 1-3) and (b) the need to advance empirical understanding of how foster homes impact the mental health of foster youth (relating to Research Questions 4 and 5). Implications for research are presented below with the primary idea followed by a suggestion on how implementation might look and why it would benefit the field of child welfare.

First, it will be important to refine the analytic approach to assessing quality levels of foster homes. Because foster care is one of the primary interventions for child maltreatment, and is composed of a complex array of characteristics, understanding the malleable factors associated with quality foster home environments is a critical area of research with much to be discovered. Prior research has furthered our understanding of many of the elements of foster parenting and foster home licensing. However, this research has been done in a piecemeal fashion, ignoring the cumulative impact of its individual factors or indicators.

Some possible approaches for refinement are presented here. A first approach involves the use of different clustering techniques in order to highlight the variability between foster homes. For example, comparisons can be made between the density- or distribution-based clustering methods—which utilize different algorithms or rules to group cases—and the HACA and K-means methods used in this study. Similarly, latent profile analysis is a technique almost identical to LCA but with an allowance for combined categorical and continuous variables in the models. The aim is the same as with LCA with added flexibility on variable structures. Another option is to use an approach that includes outcomes as part of the modeling, such as with classification and regression trees (CART analyses). This approach can examine levels of mental health (or another outcome) in relation to different combinations of predictors of foster home elements.

Models derived from any of these techniques could be cross validated by splitting the dataset into a training and a test set, then examining how the test set fits the clusters identified from the training set. They could also be validated by bootstrapping multiple samples from the dataset and assessing the reliability of the results. The end goal for this continuing analytical effort is to more validly and reliably model a closer representation of a true typology of foster homes.

The next approach is more substantive in nature. With an aim to include additional important elements in developing a typology, the essential factors that contribute to quality in a complex foster home setting need unpacking. Previous research and the main results of this study suggest four key elements worth exploring: (a) building and maintaining relationships; (b) stability and familiarity with surroundings and people;

(c) hope and future growth and development over time; and (d) healing from past trauma. Each element is discussed briefly below.

The first element is relationships. Relationships are perhaps the key feature of the child welfare system. They both create the problems resulting from the parent/child relationship breakdown and are the proposed solution through the inclusion of foster parents. Even in the case of institutional youth settings, relationships with peers and staff are a critical component of positive growth (Southerland, et al., 2008). Research should seek to better understand what a quality foster home looks like in different relational contexts (i.e., a kinship foster parent setting as compared to a non-custodial biological parent household). A focus should also be on determining what types of relationships are most impactful and malleable.

Secondly, it is important to assess the stability and familiarity with the surroundings of foster youth (e.g., Holtan et al., 2005). This includes studying the continuity of youths' living situation and may involve exploring: (a) changes in school enrollment upon entry into foster care; (b) the proximity of their foster home environment with respect to their prior environment; (c) a youth's level of familiarity with the broader community of a new placements; and (d) how friendships are maintained or lost in the transition into or between foster homes. Research studies focused upon these exploratory questions could enhance our understanding of the impact of environmental stability as an indicator of foster home quality.

Thirdly, child welfare researchers should measure elements that engender hope. The field of positive psychology (Kwoks, Kit, 2016) suggests that hope is a mindset that contributes to overcoming significant challenges. Foster youth are a population fraught

with significant challenges. Researchers should therefore consider elements such as positive approaches to parenting (e.g., Farruggia, Greenberger, Chen, & Heckhausen, 2006); the mental health, relational consistency, warmth, and positivity of foster parents (e.g., Garcia et al., 2014) and the availability of adequate resources. They might also design studies that identify opportunities for diverse parental figures to engage in learning and skill development. Researchers should craft studies that examine how expressions of creativity through art, music, song, dance, and other healing approaches are encouraged in the foster home (Martin & Jackson, 2002).

Finally, child welfare researchers should assess the presence of elements in a foster child's environment that encourage healing. These might include specific education around trauma and despair that a foster parent has participated in. Outcome measurement focused upon healing should include the level of access to physical health care (including medical, dental, and vision) in order to address ongoing and new health needs. Researchers should identify structured opportunities for participation in mental health services for both the foster youth and their caregiver. They should also consider the attitudes of caregivers related to offering regular encouragement and promoting access to these and other services.

Beyond exploring additional important elements to be included in future analyses, researchers should be diligent in considering underutilized methods of analyzing that information. The model presented in this thesis serves as an example of child welfare research using a data-driven rather than a hypothesis-driven approach. There is great potential in utilizing this approach for two reasons. The first is that state and national child welfare systems have access to expansive sets of administrative and community-

based data. These data contain a complicated agglomeration of information that may be difficult to conceptualize in testable hypotheses. Uncovering patterns and trends in those data using a broad, exploratory approach that is guided by a few overarching practical questions may be more fruitful than narrowing studies to a few specific hypotheses. The second reason is that our capacity to process large amounts of data via statistical software is increasing. Not only is software continually evolving, but fundamental shifts in processing (e.g., quantum computing) will allow data to be explored in ways that are yet to be determined

Implications for practice, programming, and policies concern two overarching themes. These are (a) the improvement of the process of certification of foster homes and (b) the effort to identify areas of deficit more precisely with the intent to provide tailored support to foster parents. General recommendations associated with these themes are presented below followed by a suggested directive for state child welfare programs.

The first recommendation is that the certification process should be enhanced to improve the assessment of foster homes. As was suggested in Chapter 1, the process of certifying a foster home relies heavily on an individual certifier to distill characteristics of a home into a binary conclusion of satisfactory or unsatisfactory. This study underscores the complexity and challenge of effectively assessing and understanding foster homes. Specifically, the minimal variance in outcomes explained by the models suggests that our understanding of the degree of complexity is still very limited.

Three adjustments to the certification process may lead to improvements in this area. The first adjustment is to improve the measurement tools used in certifying foster homes. At a minimum, child welfare leaders—including administrators and supervisors

who are responsible for the oversight and management of foster parent recruitment and certification—should promote greater variability in instruments used to measure constructs. This can involve the provision of additional responses using the same tools; it can also involve the use of scales rather than binary response choices. Preferably, child welfare leaders should collaborate with child welfare researchers to develop improved instruments and measurement processes.

The second includes the involvement of additional professionals to promote interprofessional collaboration in improving the contexts and delivery of effective foster parenting. Specifically, child welfare leaders should include clinical mental health professionals to assess the emotional health of foster parents and possibly the functionality of the family. Other professionals may include a nurse or physician to assess the physical health as well as a trained professional to assess of intellectual capacity. Including these other professionals in the certification process would be costly in time, financial resources, and needed supervision and coordination. However, adjustments could be made to the current process (OAR 413-200-0379 (1)) in order to ensure adequate time is given without delaying the placement of foster children.

The third adjustment is to be more precise in efforts to improve the quality of foster homes served by child welfare agencies. This study's findings support prior research and policy suggesting that kinship care and sibling togetherness are clearly preferred, implying that agencies continue in their goal to keep siblings together and place children with family (in accordance with the placement of youth in the least restrictive and most home-like setting). This study also found that foster parent

education, experience, and resources are malleable and beneficial characteristics of foster homes.

The approach to improvement of the child welfare system would benefit from a shift away from the broad level to a more granular level of understanding foster homes and parents. Trainings currently aim to educate foster parents at a broad level of competence, but a more specific and targeted approach may do more to contribute to developing expertise in specific areas (Leve et al., 2012). Agencies that can provide trainings specific to the unique needs of their foster parents may develop a pool of caregivers with a sense of mastery and confidence. This in turn may support and sustain those long-serving and highly experienced foster parents that are increasingly needed to support youth in foster care.

Lastly, incorporating some of the implications outlined above, a suggestion is presented specific to state child welfare systems, including the Oregon Department of Human Services and its sister organizations (including the Oregon Health Administration). It is recommended that a plan be adopted to improve the quality and consistency of foster home and parent information gathered during initial certification-related assessments. This effort may start small by targeting one or two domains of importance and expanding as the process is refined in consultation with family leaders. To begin, it will be important to identify additional data needed to understand the applicants' strengths and challenges in the context of relationships. At a minimum, it will be valuable to include understanding of (a) potential care partners' capability for attachment/bond formation, (b) their propensity to amicably resolve conflicts, (c) their capacity to effectively communicate with others with positive regard, and (d) their

inclination to focus on strengths. This information would benefit child placement decisions as well as ongoing foster parent training opportunities. In addition, it is recommended that agencies collect detailed information on foster youth relationships. This will include prioritizing the identification of positive existing foster youth and foster parent relationships with the intention of supporting their continuation while encouraging the formation of new supports. These recommendations are also intended to be used as examples to promote similar efforts to improve the type and utility of data gathered throughout the certification process.

Conclusions

The overarching intention of this study was to better understand how foster homes impacted foster youth mental health. The study was conducted with a quality dataset using relatively advanced and useful methods of analysis despite the noted limitations. In conclusion, some important findings were identified.

It was hypothesized that we could distinguish one type of foster home from another. This hypothesis was proved to be correct. It was also hypothesized that foster youth living in foster homes characterized with high levels of some or all of the variables of home integration, resources, cultural match, sibling relationships, living with kin and siblings, and having more contact with their biological parents would exhibit fewer negative mental health outcomes than those with lower levels of the variables. This was partially true. A number of those variables were suggestive of improved mental health, namely kinship care, sibling togetherness, and resources. However, findings were inconclusive regarding the others.

It was also hypothesized that foster youth who live in homes with high levels of the variables described above would improve on mental health outcomes more significantly than those with low levels of those variables. This was also partially true. There were only a few findings suggestive of improvements in mental health over time. Those findings also supported the importance of kinship care and sibling togetherness.

It was anticipated that a clear typology with distinct characteristics would emerge from the data and be replicated across the three clustering methods. That was proven to not be the case in this study. Perhaps it was overly simplistic or naïve to assume that an entity as complex as a foster home environment could be distilled into a few easily understood categories. Although child welfare researchers and organizations have made considerable progress in terms of better understanding this group of vulnerable young people, the problem persists.

There are a vast number of questions that remain unanswered and ideas that remain unexplored. Atop the list are the following basic questions that concern Why and How:

- Why is child maltreatment still so pervasive? Why haven't decades of research had more of an impact on the issue? Why is it increasingly difficult to recruit foster parents, clinicians, and child welfare workers who supply the essential labor force for child welfare systems?
- How have the changes in our society impacted the welfare of children and the state of child welfare services? How do the challenges related to our political, health care, and education systems fit into the equation?

Given the ongoing challenges of a pandemic and social unrest, the effort to respond to cases of child maltreatment and its enduring negative impact looks rather bleak. Nevertheless, future child welfare research studies such as the one presented here will continue to seek a solution to the fundamental questions of Why and How.

Finally, a key takeaway from embarking on this study has been to notice the monetary and human resources employed in efforts to support youth in foster care. Individuals and families who take on the challenge of caring for foster youth are fighting to limit the devastating impact of child maltreatment. There is often a significant sacrifice involved in providing these services. Additional support such as providing adequate financial resources, better access to ancillary services, and enhanced educational opportunities for foster parents is desperately needed. With a few exceptions, the child welfare system is full of good, kind, caring people who engage in this work. Our society owes a debt of gratitude for the efforts of foster parents and child welfare workers who tirelessly strive to meet one of our world's greatest societal challenges.

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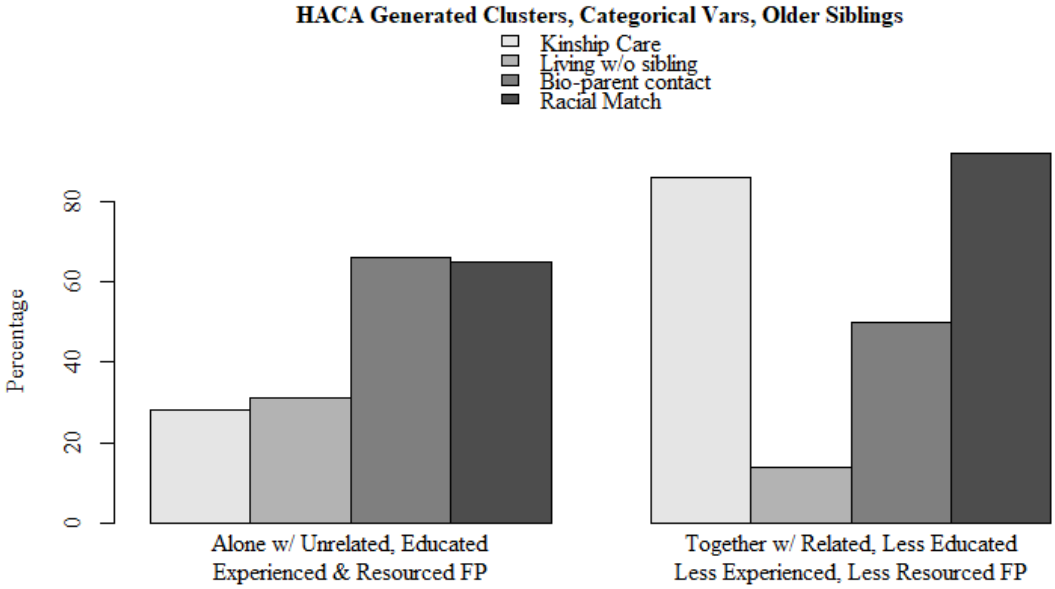
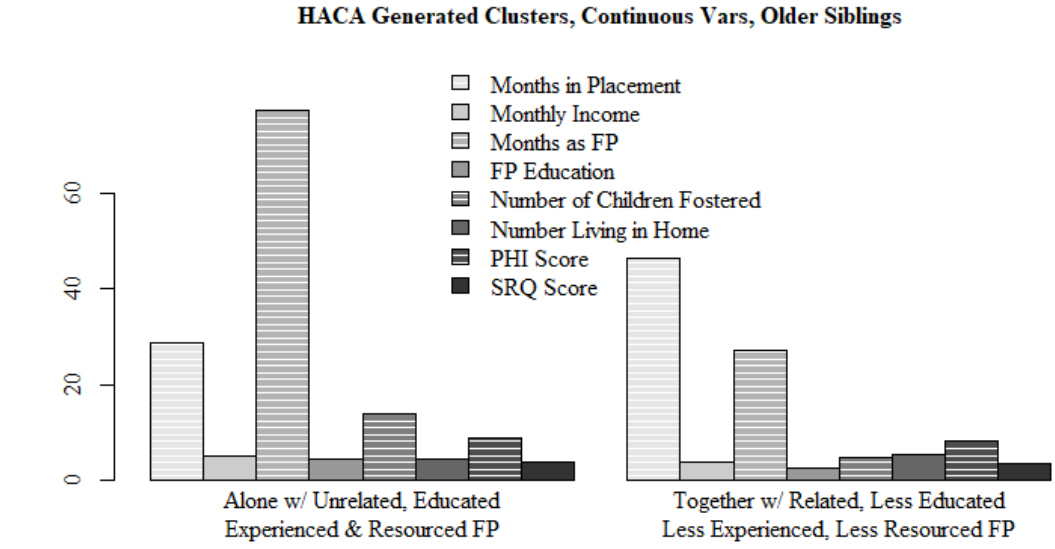
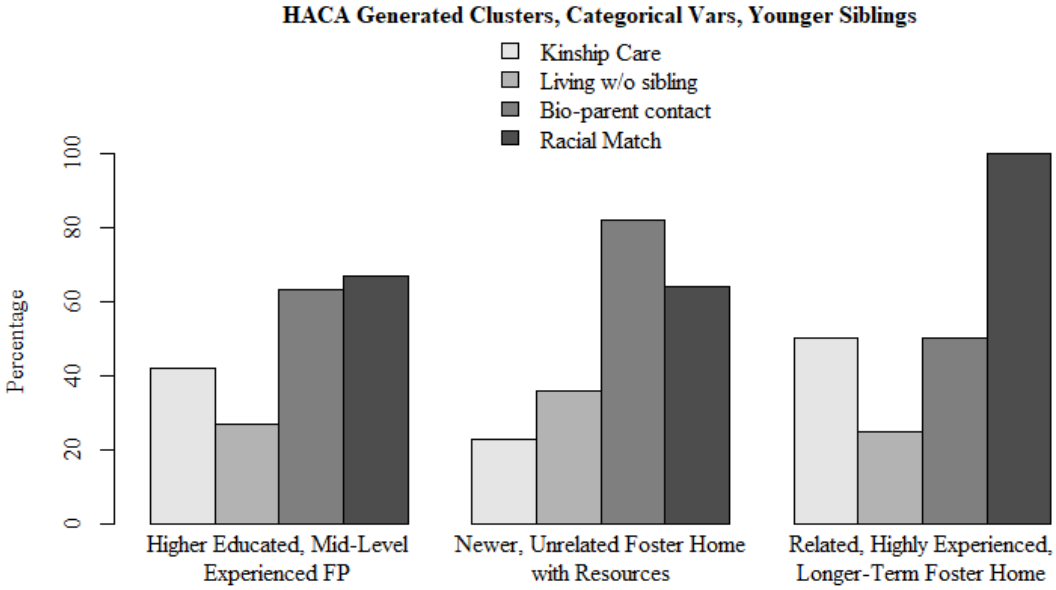
Appendix A: Additional Figures






HACA Generated Clusters, Categorical Vars, Younger Siblings
Kinship Care
Living w/o sibling
Bio-parent contact
Racial Match
Percentage
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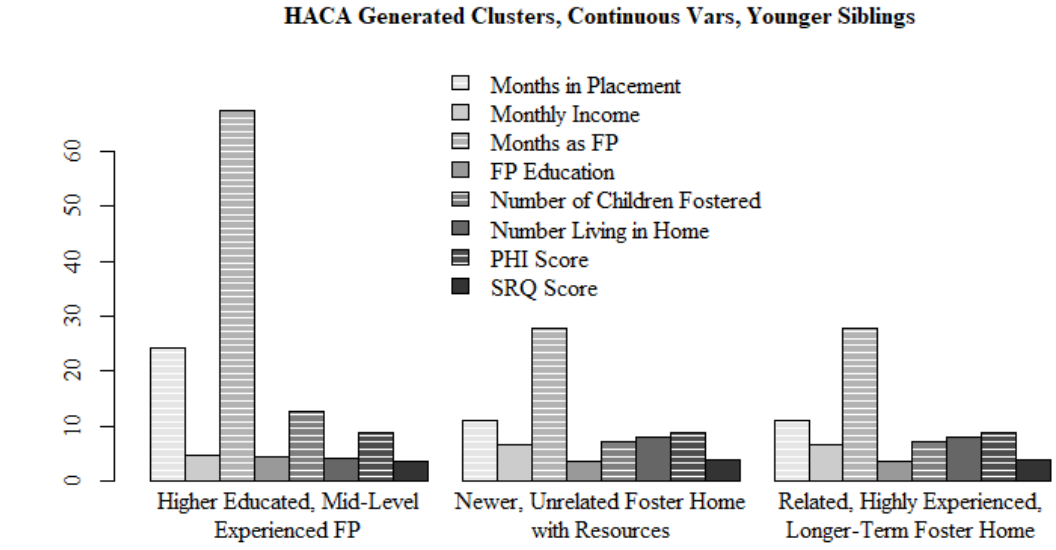
Higher Educated, Mid-Level Experienced FP
Newer, Unrelated Foster Home with Resources
Related, Highly Experienced, Longer-Term Foster Home


HACA Generated Clusters, Continuous Vars, Younger Siblings
Months in Placement
Monthly Income
Months as FP
FP Education
Number of Children Fostered
Number Living in Home
PHI Score
SRQ Score
0
10
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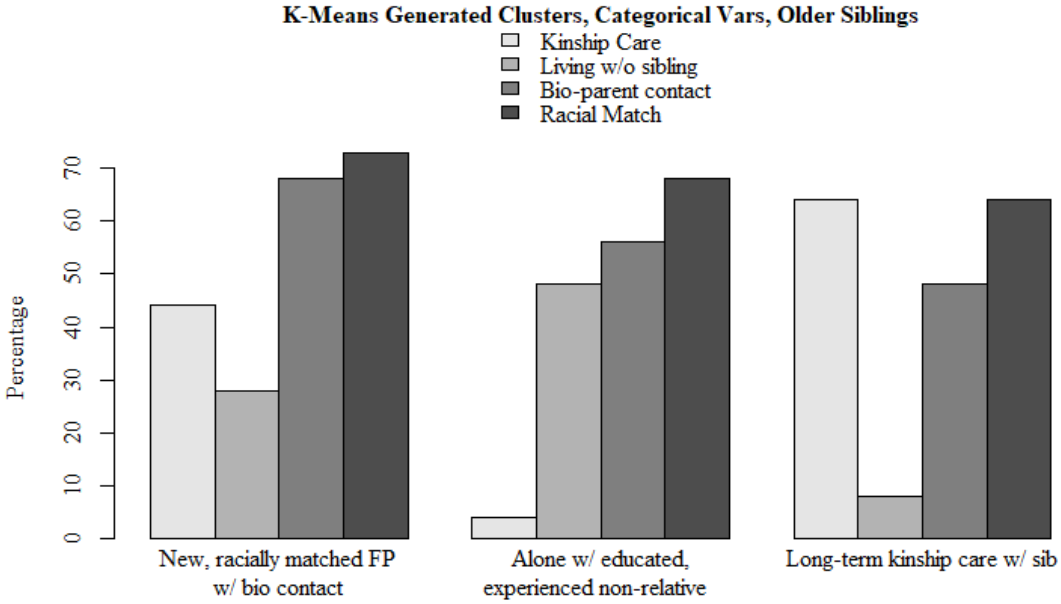
Higher Educated, Mid-Level Experienced FP
Newer, Unrelated Foster Home with Resources
Related, Highly Experienced, Longer-Term Foster Home


K-Means Generated Clusters, Categorical Vars, Older Siblings
Kinship Care
Living w/o sibling
Bio-parent contact
Racial Match
Percentage
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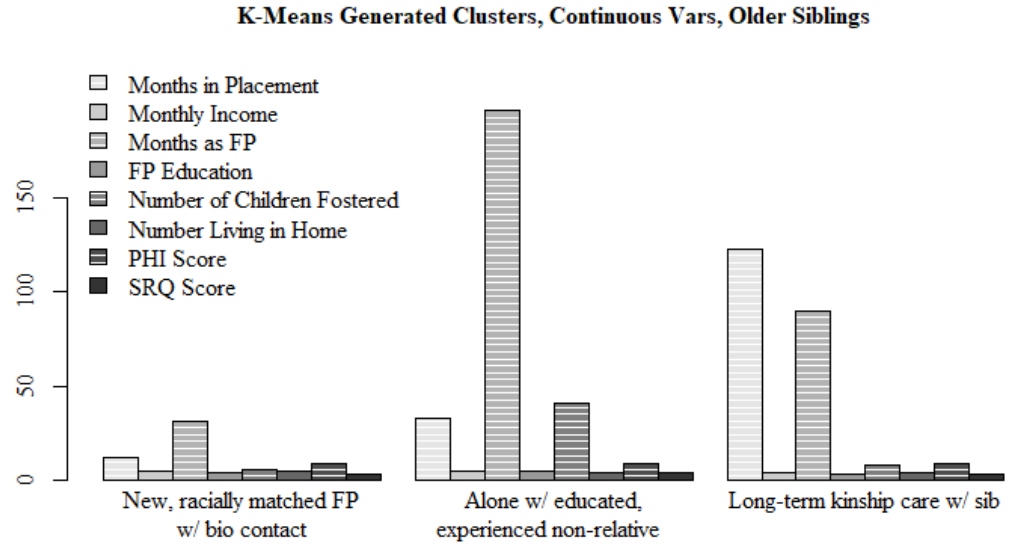
New, racially matched FP w/ bio contact
Alone w/ educated, experienced non-relative
Long-term kinship care w/ sib


K-Means Generated Clusters, Continuous Vars, Older Siblings
Months in Placement
Monthly Income
Months as FP
FP Education
Number of Children Fostered
Number Living in Home
PHI Score
SRQ Score
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50
100
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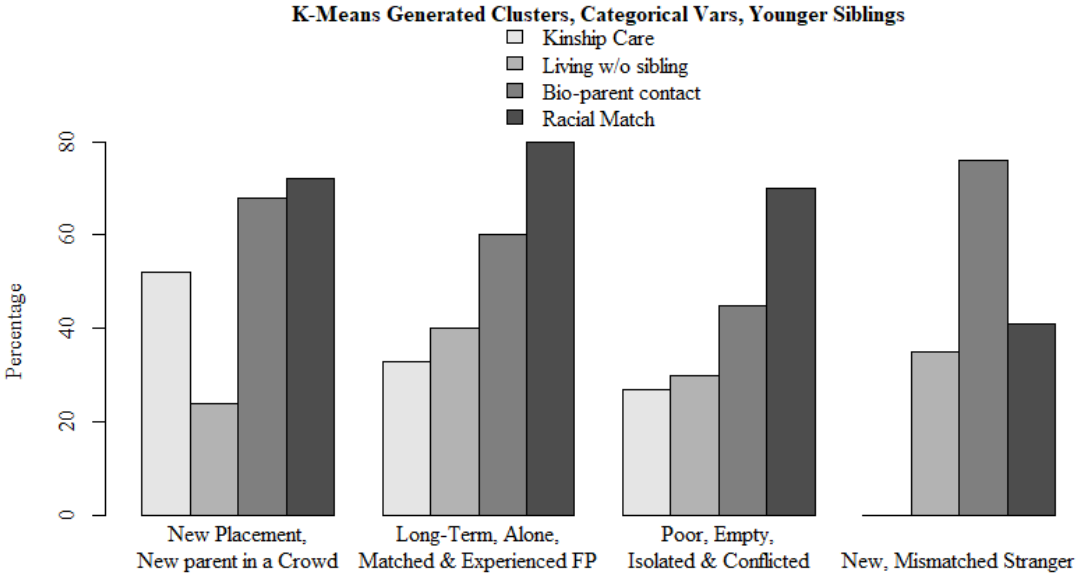
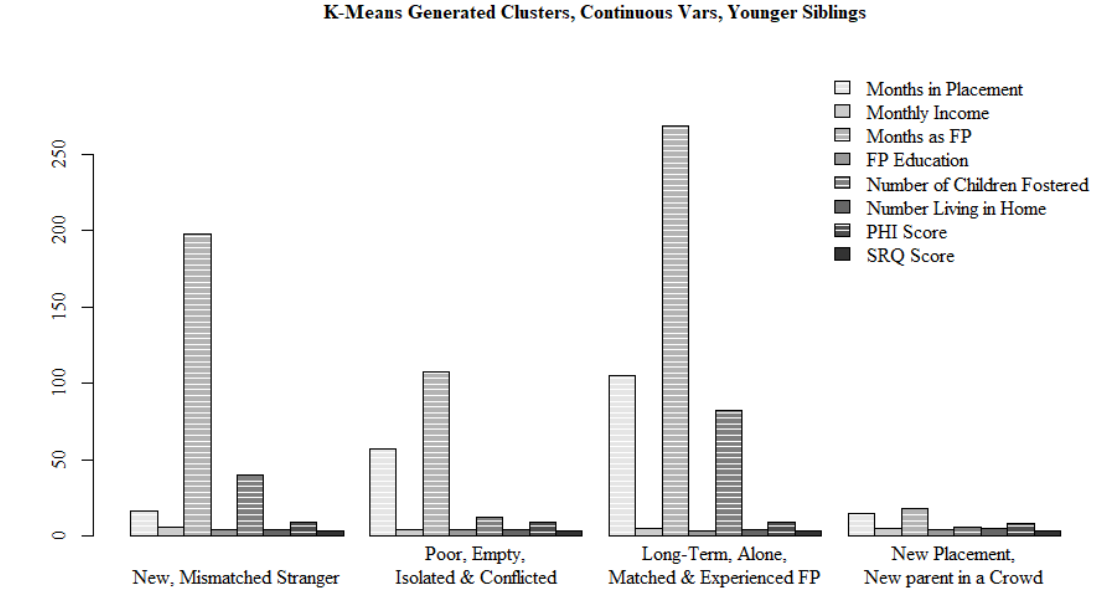
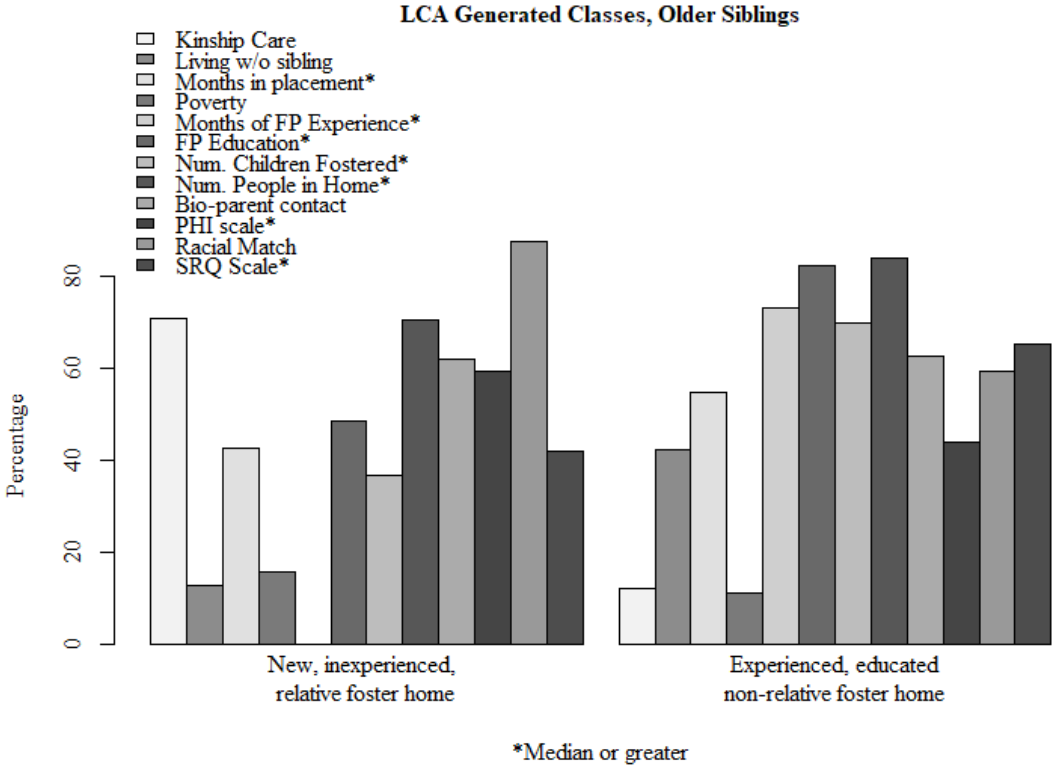
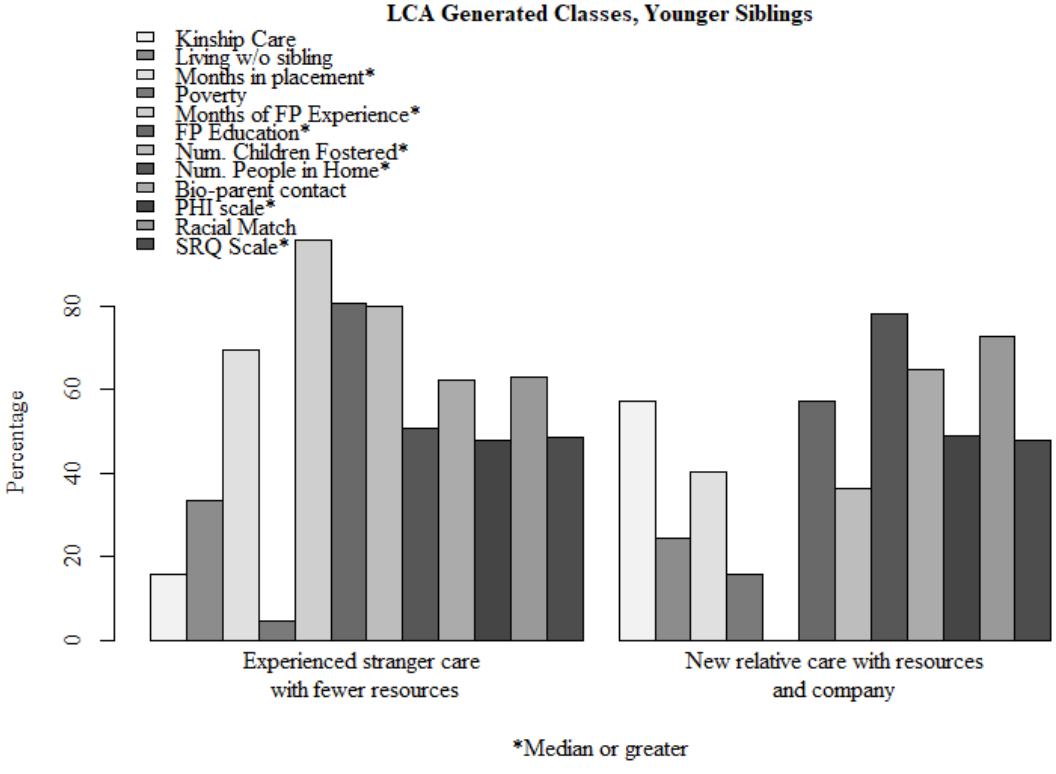
New, racially matched FP w/ bio contact
Alone w/ educated, experienced non-relative
Long-term kinship care w/ sib


K-Means Generated Clusters, Categorical Vars, Younger Siblings
Kinship Care
Living w/o sibling
Bio-parent contact
Racial Match
Percentage
0
20
40
60
80
New Placement,
New parent in a Crowd
Long-Term, Alone,
Matched & Experienced FP
Poor, Empty,
Isolated & Conflicted
New, Mismatched Stranger


K-Means Generated Clusters, Continuous Vars, Younger Siblings
Months in Placement
Monthly Income
Months as FP
FP Education
Number of Children Fostered
Number Living in Home
PHI Score
SRQ Score
0
50
100
150
200
250
New, Mismatched Stranger
Poor, Empty,
Isolated & Conflicted
Long-Term, Alone,
Matched & Experienced FP
New Placement,
New parent in a Crowd


LCA Generated Classes, Older Siblings
Kinship Care
Living w/o sibling
Months in placement*
Poverty
Months of FP Experience*
FP Education*
Num. Children Fostered*
Num. People in Home*
Bio-parent contact
PHI scale*
Racial Match
SRQ Scale*
Percentage
0
20
40
60
80
New, inexperienced, relative foster home
Experienced, educated non-relative foster home
*Median or greater


LCA Generated Classes, Younger Siblings
Kinship Care
Living w/o sibling
Months in placement*
Poverty
Months of FP Experience*
FP Education*
Num. Children Fostered*
Num. People in Home*
Bio-parent contact
PHI scale*
Racial Match
SRQ Scale*
Percentage
0
20
40
60
80
Experienced stranger care with fewer resources
New relative care with resources and company
*Median or greater

Appendix B: Additional Tables

Table B.1 Latent Class Comparisons

One group is more likely than the other to:

Older Siblings	Younger Sibling
Live in Kinship care	Live in Kinship care
Live with Siblings	Live with Siblings
Be in the same home for less time	Be in the same home for less time
Be with newer foster parents	Live in poverty
Have a less educated foster parent	Be with newer foster parents
Have a foster parent who has fostered fewer children	Have a less educated foster parent
Live with more people in the house	Have a foster parent who has fostered fewer children
Feel more integrated in the home	Live with more people in the house
Be racially matched	Be racially matched
Have lower sibling relationship score	

Variables without substantial differences:

Likelihood of being in poverty	Contact with biological parent
Contact with biological parent	Positive home integration score
	Sibling relationship score

Table B.2 Group Numbers and Possible Intervention Focus

Hierarchical Agglomerative Cluster Analysis (HACA)		
Older Siblings	Group 1-Referent	Sibling connection
	Group 2	New FP support/education, resources
Younger Siblings	Group 1-Referent	Family connections (default intervention) consider support based on racial/ethnic heritage
	Group 2	FP education, consider crowded home, consider support based on race/ethnic heritage
	Group 3	FP education, family connections
K-Means Cluster Analysis		
Older Siblings	Group 1-Referent	New FP support/education
	Group 2	Family connections, sibling connection, racial/ethnic heritage support
	Group 3	Adoption considerations, FP education, racial/ethnic heritage support
Younger Siblings	Group 1-Referent	New FP support/education, consider number in home, home integration
	Group 2	Family Connections, sibling connection
	Group 3	Family connections, sibling connection and relationships, resources, home integration
	Group 4	Family connections, sibling connection, racial/ethnic heritage support
Latent Class Analysis (LCA)		
Older Siblings	Group 1-Referent	New FP support/education-siblings relationships
	Group 2	Family connections (default intervention) consider support based on racial/ethnic heritage
Younger Siblings	Group 1-Referent	Family Connections, sibling connection
	Group 2	New FP support/education

Table B.3 HACA Group Comparisons on Baseline Measures- Older Siblings

	Mean	SD	Mean	SD	*F*	*P*
Measure	Group1 (n=124)		Group 2 (n=36)			
CDI	7.2	6.84	11.43	10.26	3.21	.0248*
	(n=120)		(n=36)			
CROPS	19.81	9.19	22.17	11.15	1.30	0.28
	(n=121)		(n=35)			
Hopelessness Scale	29.26	6.23	33.86	9.43	4.08	.008**
	(n=117)		(n=36)			
CBCL Internalizing	11.91	8.37	12.33	9.50	0.58	0.63
CBCL Externalizing	16.16	12.44	16.28	15.01	0.67	0.58
CBCL Total Score	50.81	32.65	46.94	34.27	0.85	0.47

*Notes:*p<.05, **p<.01, ***p<.001, †p<.10*

Table B.4 HACA Group Comparisons on Baseline Measures - Younger Siblings

Measure	Mean	SD	Mean	SD	Mean	SD	*F*	*P*
	Group 1 (n=122)		Group 2 (n=21)		Group 3 (n=16)			
CDI	6.72	5.82	7.33	6.07	8.60	7.94	0.91	0.44
	(n=122)		(n=21)		(n=15)			
CROPS	20.34	9.23	22.33	8.66	26.60	8.46	3.72	.01*
	(n=116)		(n=20)		(n=14)			
Hopelessness Scale	31.76	7.75	28.8	6.17	31.43	7.84	0.93	0.43
	(n=119)		(n=22)		(n=15)			
CBCL Internalizing	10.19	8.61	11.41	9.00	9.13	7.35	0.46	0.71
CBCL Externalizing	14.82	11.43	12.82	9.60	13.53	13.46	0.33	0.81
CBCL Total Score	47.51	32.38	43.32	25.38	43.20	37.66	0.39	0.76

*Notes:*p<.05, **p<.01, ***p<.001, †p<.10*

Table B.5 K-Means Group Comparisons on Baseline Measures – Older Siblings

	Mean	SD	Mean	SD	Mean	SD	*F*	*P*
Measure	Group 1 (n=25)		Group 2 (n=111)		Group 3 (n=25)			
CDI	7.9	7.14	8.82	8.52	5.34	4.45	1.71	0.17
	(n=25)		(n=109)		(n=23)			
CROPS	20.64	9.28	20.45	9.91	19.83	9.28	0.66	0.58
	(n=24)		(n=108)		(n=23)			
Hopelessness Scale	32	6.88	30.33	7.71	28.56	5.25	1.10	0.35
	(n=23)		(n=107)		(n=24)			
CBCL Internalizing	13.26	9.51	11.48	8.49	24	13.29	1.02	0.39
CBCL Externalizing	17.48	14.26	15.11	12.69	20.25	12.98	1.50	0.22
CBCL Total Score	51.65	38.94	46.71	31.89	63.33	28.75	2.33	0.08

*Notes:*p<.05, **p<.01, ***p<.001, †p<.10*

Table B.6 K-Means Group Comparisons on Baseline Measures - Younger Siblings

	Mean	SD	Mean	SD	Mean	SD	Mean	SD	*F*	*P*
Measure	Group 1 (n=96)		Group 2 (n=15)		Group 3 (n=32)		Group 4 (n=17)			
CDI	7	6.18	6.64	6.88	6.78	6.14	7.22	5.16	0.03	0.99
	(n=96)		(n=14)		(n=32)		(n=17)			
CROPS	20.59	9.15	21.07	9.83	21.41	9.61	23.18	9.86	0.38	0.77
	(n=91)		(n=13)		(n=31)		(n=16)			
Hopelessness Scale	30.96	7.91	31.69	8.39	31.94	6.11	31.81	8.05	0.17	0.92
	(n=94)		(n=13)		(n=33)		(n=17)			
CBCL Internalizing	9.02	7.27	9.77	7.43	12.58	10.64	12.59	10.27	1.95	0.12
CBCL Externalizing	12.05	9.46	13.31	10.75	17.33	11.89	22.24	15.65	5.23	.00**
CBCL Total Score	39.71	26.28	44.62	33.56	56.42	35.07	64.71	41.82	4.66	.00**

*Notes:*p<.05, **p<.01, ***p<.001, †p<.10*

Table B.7 LCA Group Comparisons on Baseline Measures -Older Siblings

	Mean	SD	Mean	SD	*F*	*P*
Measure	Group 1		Group 2			
	(n=79)		(n=83)			
CDI	8.07	8.34	8.11	7.48	0.00	0.97
	(n=79)		(n=79)			
CROPS	19.28	10.57	21.33	8.69	1.78	0.19
	(n=78)		(n=80)			
Hopelessness Scale	31.15	7.81	29.41	6.62	2.29	0.13
	(n=75)		(n=80)			
CBCL Internalizing	10.33	8.09	13.47	8.84	5.30	.023*
CBCL Externalizing	13.17	12.48	18.99	13.00	8.05	.005**
CBCL Total Score	40.19	28.32	58.73	34.66	13.19	.0004***

*Notes:*p<.05, **p<.01, ***p<.001, †p<.10*

Table B.8 LCA Group Comparisons on Baseline Measures -Younger Siblings

	Mean	SD	Mean	SD	*F*	*P*
Measure	Group 1 (n=68)		Group 2 (n=92)			
CDI	6.59	5.85	7.21	6.27	0.40	0.53
	(n=68)		(n=91)			
CROPS	19.99	9.88	21.89	8.85	1.63	0.20
	(n=63)		(n=88)			
Hopelessness Scale	31.89	7.08	30.9	7.92	0.63	0.43
	(n=66)		(n=91)			
CBCL Internalizing	11.55	8.84	9.25	8.18	2.81	0.10†
CBCL Externalizing	18.14	12.68	11.64	9.41	13.61	.00***
CBCL Total Score	57.59	35.13	38.18	26.61	15.53	.00***

*Notes:*p<.05, **p<.01, ***p<.001, †p<.10*

Table B.9 Children's Depression Index HLM Findings-Older Siblings

	Intercepts Only Model	Group and Txnum as predictors	Group * Time centered at FA2
Statistically Significant Fixed Effects			
HACA			
Intercept	6.93 (.45)***	6.47 (.67)***	5.74 (.76)***
HCA group #2		2.81 (1.07)**	1.42 (1.29)
Month 18			-.07 (.03)*
Group * month Centered at FA2			-.14 (.07)*
K-Means			
Intercept	7.37 (1.14)***	7.41 (1.19)***	6.73 (1.42)***
No additional Findings			
LCA			
Intercept	6.86 (.45)***	6.74 (.81)***	5.65 (.93)***
Month 18			-.11 (.04)*

Note: *** p < .001, ** p < .01, * p < .05, † p < .10

Table B.10 Children's Depression Index HLM Findings-Younger Siblings

	Intercepts Only Model	Group and Txnum as predictors	Group * Time centered at FA2
Statistically Significant Fixed Effects			
HACA			
Intercept	5.89 (.36)***	5.60 (.55)***	4.71 (.62)***
Month 18			-.09 (.03)***
K-Means			
Intercept	5.86 (.36)***	5.58 (.59)***	4.45 (.68)***
LCA			
Intercept	5.86 (.36)***	5.50 (.65)***	4.73 (.78)***
Month 18			-.08 (.04)†

Note: *** p < .001, ** p < .01, * p < .05, † p < .10

Table B.11 Children's Report of Posttraumatic Stress HLM Findings-Older Siblings

	Intercepts Only Model	Group and Txnum as predictors	Group * Time centered at FA2
Statistically Significant Fixed Effects			
HACA			
Intercept	18.16 (.66)***	17.65 (.99)***	15.37 (1.09)***
Month 18			-.22 (.04)***
K-Means			
Intercept	18.20 (.65)***	18.71 (1.74)***	16.56 (2.00)***
Month 18			-.21 (.10)*
LCA			
Intercept	18.15 (.65)***	17.08 (1.18)***	15.18 (1.30)***
Month 18			-.19 (.05)***

Note: *** p < .001, ** p < .01, * p < .05, † p < .10

Table B.12 Children's Report of Posttraumatic Stress HLM Findings-Younger Siblings

	Intercepts Only Model	Group and Txnum as predictors	Group * Time centered at FA2
Statistically Significant Fixed Effects			
HACA			
Intercept	19.24 (.60)***	18.41 (.89)***	16.17 (1.01)***
HAC group #3		5.76 (2.03)*	4.89 (2.52)†
Month 18			-.23 (.05)***
K-Means			
Intercept	19.13 (.60)***	18.45 (2.21)***	15.86 (1.12)***
Month 18			-.26 (.05)**
LCA			
Intercept	19.13 (.60)***	18.05 (1.09)***	16.01 (1.29)***
Month 18			-.20 (.07)**

Note: *** p < .001, ** p < .01, * p < .05, † p < .10

Table B.13 Hopelessness Scale Scoreess HLM Findings-Older Siblings

	Intercepts Only Model	Group and Txnum as predictors	Group * Time centered at FA2
Statistically Significant Fixed Effects			
HACA			
Intercept	29.54 (.47)***	29.56 (.69)***	29.35 (.80)***
HAC group #2		2.81 (1.09)*	1.13 (1.37)
Group * month Centered at FA2			-.17 (.08)*
K-Means			
Intercept	29.54 (.46)***	30.73 (1.23)***	29.10 (1.52)***
Month 18			-.16 (.09)†
LCA			
Intercept	29.50 (.46)***	30.60 (.83)***	29.65 (.97) ***
Month 18			-.09 (.05)†

Note: *** p < .001, ** p < .01, * p < .05, † p < .10

Table B.14 Hopelessness Scale Scoreess HLM Findings-Younger Siblings

	Intercepts Only Model	Group and Txnum as predictors	Group * Time centered at FA2
Statistically Significant Fixed Effects			
HACA			
Intercept	30.02 (.45)***	29.85 (.69)***	28.00 (.80)***
HAC group #2		-.12 (1.33)	3.09 (1.73)†
Month 18			-.19 (.04)***
Group2 * month Centered at FA2			.32 (.11)***
K-Means			
Intercept	30.00 (.45)***	29.50 (.74)***	28.09 (.87)***
K means group #4		1.95 (1.50)	3.76 (1.90)†
Month 18			-.15 (.05)**
LCA			
Intercept	30.00 (.45)***	30.31 (.82)***	28.71 (1.01)***
Month 18			-.16 (.06)*

Note: *** p < .001, ** p < .01, * p < .05, † p < .10

Table B.15 Children's Behavior Checklist-Total Raw Score HLM Findings-Older Siblings

	Intercepts Only Model	Group and Txnum as predictors	Group * Time centered at FA2
Statistically Significant Fixed Effects			
HACA			
Intercept	46.24 (2.25)***	49.83 (3.39)***	47.61 (3.78)***
K-Means			
Intercept	46.34 (2.24)***	51.83 (6.00)***	46.70 (7.36)***
LCA			
Intercept	46.08 (2.24)***	39.99 (3.85)***	38.32 (4.37)***
LCA group #2		15.71 (4.32)***	12.51 (5.24)*

Note: *** p < .001, ** p < .01, * p < .05, † p < .10

Table B.16 Children's Behavior Checklist-Total Raw Score HLM Findings- Younger Siblings

	Intercepts Only Model	Group and Txnum as predictors	Group * Time centered at FA2
Statistically Significant Fixed Effects			
HACA			
Intercept	45.37 (2.38)***	47.88 (3.63)***	45.53 (3.92)***
K-Means			
Intercept	45.24 (2.37)***	40.80 (3.76)***	38.52 (4.10)***
K means group #2		11.71 (8.45)	20.59 (10.14)*
K means group #3		15.13 (5.90)*	16.23 (6.95)*
K means group #4		21.34 (7.67)*	18.07 (8.84)*
LCA			
Intercept	45.24 (2.37)***	56.30 (4.11)***	54.47 (4.66)***
LCA group #2		-17.17 **(**4.65**)***	-17.08 (5.44)***

Note: *** p < .001, ** p < .01, * p < .05, † p < .10

Table B.17 Children's Behavior Checklist-Subscale Raw Score HLM Findings- Older Siblings

	Intercepts Only Model	Group and Txnum as predictors	Group * Time centered at FA2
Statistically Significant Fixed Effects			
HACA			
Internalizing Subscale			
Intercept	10.86 (.56)***	11.44 (.84)***	11.11 (.97)***
HAC group #2		-.69 (1.34)	-2.86 (1.66)†
Group * month Centered at FA2			-.20 (.09)*
Externalizing Subscale			
Intercept	15.10 (.89)***	16.03 (1.34)***	15.21 (1.49)***
K-Means			
No findings for either subscale			
LCA			
Internalizing Subscale			
Intercept	10.79 (.56)***	9.76 (.98)***	9.46 (1.14)***
LCA group #2		2.58 (1.1)*	2.04 (1.38)
Externalizing Subscale			
Intercept	15.08 (.89)***	13.39 (1.55)***	13.03 (1.74)***
LCA group #2		4.77 (1.74)*	3.22 (2.08)

Note: *** p < .001, ** p < .01, * p < .05, † p < .10

Table B.18 Children's Behavior Checklist-Subscale Raw Score HLM Findings- Younger Siblings

	Intercepts Only Model	Group and Txnum as predictors	Group * Time centered at FA2
Statistically Significant Fixed Effects			
HACA			
Internalizing Subscale			
Intercept	9.66 (.56)***	9.72 (.86)***	8.96 (.97)***
Month 18			-.07 (.04)†
Externalizing Subscale			
Intercept	14.23 (.81)***	15.00 (1.24)***	14.52 (1.35)***
K-Means			
Internalizing Subscale			
Intercept	9.62 (.56)***	8.45 (.91)***	7.65 (1.03)***
K means group #2		2.88 (2.05)	6.32 (2.62)*
K means group #3		3.49 (1.43)*	3.41 (1.78)†
Group2 * month Centered at FA2			.31 (.15)*
Externalizing Subscale			
Intercept	14.18 (.81)***	12.71 (1.28)***	12.41 (1.41)***
K means group #3		4.47 (2.01)*	4.89 (2.42)*
K means group #4		8.47 (2.62)**	6.82 (3.07)*
LCA			
Internalizing Subscale			
Intercept	9.62 (.56)***	11.16 (1.0)***	10.82 (1.19)***
LCA group #2		-2.76 (1.13)*	-3.41 (1.40)*
Externalizing Subscale			
Intercept	14.18 (.81)***	17.46 (1.42)***	16.79 (1.62)***
LCA group #2		-5.17 (1.60)***	-4.65 (1.90)*

Note: *** p < .001, ** p < .01, * p < .05, † p < .10

Table B.19 Children's Depression Index HLM Models Using HACA Grouping-OS

		Parameter	Intercepts Only Model	Group and Txnum as predictors	Group * Time centered at FA2
Fixed Effects					
	Intercept	Y00 (SE)	6.93 (.45)***	6.47 (.67)***	5.74 (.76)***
	HCA group #2	Y01 (SE)		2.81 (1.07)**	1.42 (1.29)
	Treatment	Y02 (SE)		-.34 **(.89)**	-.37 **(.89)**
	Month 18	Y03 (SE)			-.07 (.03)*
	Group * month Centered at FA2				-.14 (.07)*
Random Effects		Parameter	Std. Dev	Std. Dev	Std. Dev
	Childid (Group)	Intercept	5.03	4.93	4.96
		Residual	4.59	4.59	4.5
Grouping Variables		# of Groups	ICC	ICC	ICC
	Childid	160	0.55	0.55	0.55
Model Information					
	Observations		517	517	517
	AIC		3294.81	3288.35	3285..40
	BIC		3307.56	3309.59	3315.14
	Pseudo-R^2 (Fixed Effects)		0	0.03	0.04
	Pseudo-R^2 (Random Effects)		0.55	0.55	0.57
Model Comparisons					
	Log Likelihood		-1644.5	-1641	-1633.2
	X^2			6.95	15.6
	P >X^2			.03*	.00***

*Note: *** p < .001, ** p < .01, * p < .05, † p < .10*

Table B.20 Children's Depression Index HLM Models Using HACA Grouping-YS

		Parameter	Intercepts Only Model	Group and Txnum as predictors	Group * Time centered at FA2
Fixed Effects					
	Intercept	γ_{00} (SE)	5.89 (.36)***	5.60 (.55)***	4.71 (.62)***
	HCA group #2	γ_{01} (SE)		.11 (1.06)	-.17 (1.33)
	HCA group #3	γ_{02} (SE)		1.66 (1.25)	1.33 (1.57)
	Treatment	γ_{03} (SE)		.24 (.73)	.20 (.72)
	Month 18	γ_{04} (SE)			-.09 (.03)***
	Group 2 * month Centered at FA2	γ_{05} (SE)			-.03 (.08)
	Group 3 * month Centered at FA2	γ_{06} (SE)			-.03 (.09)
Random Effects		Parameter	Std. Dev	Std. Dev	Std. Dev
	Childid (Group)	Intercept	3.94	3.97	3.93
	Residual		4.03	4.03	3.99
Grouping Variables		# of Groups	ICC	ICC	ICC
	Childid	162	0.49	0.49	0.49
Model Information					
	Observations		524	524	524
	AIC		3176.67	3175.32	3180
	BIC		3189.46	3200.89	3218.35
	Pseudo-R^2 (Fixed Effects)		0	0.01	0.02
	Pseudo-R^2 (Random Effects)		0.49	0.5	0.5
Model Comparisons					
	Log Likelihood		-1585.2	-1584.2	-3155.5
	X^2			1.97	13.03**
	P >X^2			0.58	0.004

*Note: *** p < .001, ** p < .01, * p < .05, † p < .10*

Table B.21 Children's Depression Index HLM Models Using K-Means Grouping-OS

		Intercepts Only Model	Group and Txnum as predictors	Group * Time centered at FA2
Fixed Effects				
	Intercept	7.37 (1.14)***	7.41 (1.19)***	6.73 (1.42)***
	K means group #2	-.10 (1.26)	-.07 (1.27)	-.55 (1.54)
	K means group #4	-2.48 (1.59)	-2.47 (1.60)	-2.66 (1.92)
	Treatment		-.12 (.90)	-.16 (.90)
	Month 18			-.07 (.08)
	Group2 * month Centered at FA2			-.05 (.08)
	Group4 * month Centered at FA2			-.02 (.10)
Random Effects		Std. Dev	Std. Dev	Std. Dev
	Childid (Group)	4.98	5	5.02
		4.58	4.58	4.53
Grouping Variables		ICC	ICC	ICC
	Childid	0.54	0.54	0.55
Model Information				
	Observations			
	AIC	3301.93	3302.28	3307.83
	BIC	3323.19	3327.79	3346.09
	Pseudo-R^2 (Fixed Effects)	0.02	0.02	0.03
	Pseudo-R^2 (Random Effects)	0.55	0.55	0.56
Model Comparisons				
	Log Likelihood	-1650.3	-1648.3	-1642.3
	X^2		3.95	11.99
	$P > X^2$		0.26	.01**

*Note: *** p < .001, ** p < .01, * p < .05, † p < .10*

Table B.22 Children's Depression Index HLM Models Using K-Means Grouping-YS

	Parameter	Intercepts	Group and	Group * Time
Fixed Effects				
Intercept	γ_{00} (SE)	5.86 (.36)***	5.58 (.59)***	4.45 (.68)***
K means group #2	γ_{01} (SE)		.11 (1.33)	.49 (1.70)
K means group #3	γ_{02} (SE)		.08 (.94)	.77 (1.17)
K means group #4	γ_{03} (SE)		.71 (1.21)	.99 (1.47)
Treatment	γ_{04} (SE)		.36 (.73)	.31 (.72)
Month 18	γ_{05} (SE)			-.11 (.03)
Group2 * month Centered at FA2	γ_{06} (SE)			.04 (.10)
Group3 * month Centered at FA2	γ_{07} (SE)			.07 (.07)
Group4 * month Centered at FA2	γ_{08} (SE)			.02 (.09)
Random Effects	Parameter	Std. Dev	Std. Dev	Std. Dev
Childid (Group)	Intercept	3.96	4.02	3.99
Residual		4.02	4.02	3.98
Grouping Variables	# of Groups	ICC	ICC	ICC
Childid	163	0.49	0.5	0.5
Model Information				
Observations		527	527	527
AIC		3193.55	3193.51	3202.57
BIC		3206.35	3223.38	3249.51
Pseudo-R^2 (Fixed Effects)		0	0	0.02
Pseudo-R^2 (Random Effects)		0.49	0.5	0.51
Model Comparisons				
Log Likelihood		-1593.7	-1593.4	-1586.4
X^2			0.63	13.95**
$P > X^2$			0.96	0.007

*Note: *** p < .001, ** p < .01, * p < .05, † p < .10*

Table B.23: Children's Depression Index HLM Models Using LCA Grouping-OS

		Parameter	Intercepts Only Model	Group and Txnum as predictors	Group * Time centered at FA2
Fixed Effects					
	Intercept	γ_{00} (SE)	6.86 (.45)***	6.74 (.81)***	5.65 (.93)***
	LCA group #2	γ_{01} (SE)		.26 (.90)	.35 (1.09)
	Treatment	γ_{02} (SE)		-.02 (.90)	-.05 (.91)
	Month 18	γ_{03} (SE)			-.11 (.04)*
	Group * month Centered at FA2	γ_{04} (SE)			.01 (.06)
Random Effects		Parameter	Std. Dev	Std. Dev	Std. Dev
	Childid (Group)	Intercept	5.03	5.07	5.09
		Residual	4.57	4.57	4.51
Grouping Variables		# of Groups	ICC	ICC	ICC
	Childid	162	0.55	0.55	0.56
Model Information					
	Observations:		522	522	522
	AIC:		3324	3324.65	3325.75
	BIC:		3336.77	3345.94	3355.55
	Pseudo-R^2 (Fixed Effects)		0	0	0.01
	Pseudo-R^2 (Random Effects)		0.55	0.55	0.57
Model Comparisons					
	Loglikelihood		-1659.1	-1659.1	-1653.1
	X^2			0.086	11.918
	P >X^2			0.9579	.003**

*Note: *** p < .001, ** p < .01, * p < .05*

Table B.24 Children's Depression Index HLM Models Using LCA grouping-YS

	Parameter	Intercepts	Group and	Group * Time
Fixed Effects				
Intercept	γ_{00} (SE)	5.86 (.36)***	5.50 (.65)***	4.73 (.78)***
LCA group #2	γ_{01} (SE)		.31 (.74)	.02 (.91)
Treatment	γ_{02} (SE)		.36 (.73)	.32 (.72)
Month 18	γ_{03} (SE)			-.08 (.04)†
Group * month Centered at FA2	γ_{04} (SE)			-.03 (.05)
Random Effects	Parameter	Std. Dev	Std. Dev	Std. Dev
Childid (Group)	Intercept	3.96	3.99	3.95
	Residual	4.02	4.02	3.97
Grouping Variables:	# of Groups	ICC	ICC	ICC
Childid	163	0.49	0.5	0.5
Model Information:				
Observations:		527	527	527
AIC:		3193.55	3194.69	3194.99
BIC:		3206.35	3219.03	3224.86
Pseudo-R^2 (Fixed Effects)		0	0	0.01
Pseudo-R^2 (Random Effects)		0.49	0.5	0.5
Model Comparisons				
Loglikelihood		-1593.7	-1593.4	-1586.8
X^2			0.46	13.20**
$P > X^2$			0.8	0.001

Note: *** p < .001, ** p < .01, * p < .05, † p < .10

Table B.25 Children's Report of Posttraumatic Symptoms HLM Models Using HACA Grouping-OS

	Parameter	Intercepts Only Model	Group and Txnum as predictors	Group * Time centered at FA2
Fixed Effects				
Intercept	γ_{00} (SE)	18.16 (.66)***	17.65 (.99)***	15.37 (1.09)***
HAC group #2	γ_{01} (SE)		1.69 (1.57)	.77 (1.83)
Treatment	γ_{02} (SE)			.18 (1.32)
Month 18	γ_{03} (SE)			-.22 (.04)***
Group * month Centered at FA2	γ_{04} (SE)			-.09 **(**.09**)**
Random Effects	Parameter	Std Dev.	Std Dev.	Std Dev.
Childid (Group)	Intercept	7.49	7.51	7.59
	Residual	5.98	5.98	5.65
Grouping Variables	# of Groups	ICC	ICC	ICC
Childid	160	0.61	0.61	0.64
Model Information				
Observations		508	508	508
AIC		3540.83	3538.47	3509.74
BIC		3553.52	3559.62	3539.36
Pseudo-R^2 (Fixed Effects)		0	0.01	0.04
Pseudo-R^2 (Random Effects)		0.61	0.61	0.66
Model Comparisons				
Log Likelihood		-1767.9	-1769.3	-1747.1
X^2			1.24	40.42***
P >X^2			0.54	0

*Note: *** p < .001, ** p < .01, * p < .05,* † p < .10

Table B.26 Children's Report of Posttraumatic Symptoms HLM Models Using HACA Grouping-YS

	Parameter	Intercepts Only Model	Group and Txnum as predictors	Group * Time centered at FA2
Fixed Effects				
Intercept	γ_{00} (SE)	19.24 (.60)***	18.41 (.89)***	16.17 (1.01)***
HAC group #2	γ_{01} (SE)		1.84 (1.74)	.83 (2.15)
HAC group #3	γ_{02} (SE)		5.76 (2.03)*	4.89 (2.52)†
Treatment	γ_{03} (SE)		.09 (1.18)	-.05 (1.17)
Month 18	γ_{04} (SE)			-.23 (.05)***
Group2 * month Centered at FA2	γ_{05} (SE)			-.10 (.12)
Group3 * month Centered at FA2	γ_{06} (SE)			-.09 (.15)
Random Effects	Parameter	Std Dev.	Std Dev.	Std Dev.
Childid (Group)	Intercept	6.53	6.36	6.44
	Residual	6.6	6.61	6.34
Grouping Variables	# of Groups	ICC	ICC	ICC
Childid	161	0.49	0.48	0.51
Model Information				
Observations		521	521	521
AIC		3674.56	3663.74	3644.68
BIC		3687.33	3689.27	3682.98
Pseudo-R^2 (Fixed Effects)		0	0.03	0.06
Pseudo-R^2 (Random Effects)		0.49	0.5	0.54
Model Comparisons				
Log Likelihood		-1834.7	-1830.4	-1813.4
X^2			8.57*	33.92***
$P > X^2$			0.04	0

*Note: *** $p < .001$, ** $p < .01$, * $p < .05$, † $p < .10$*

Table B.27 Children's Report of Posttraumatic Symptoms HLM Models Using K-Means Grouping-OS

		Parameter	Intercepts Only Model	Group and Txnum as predictors	Group * Time centered at FA2
Fixed Effects					
	Intercept	γ_{00} (SE)	18.20 (.65)***	18.71 (1.74)***	16.56 (2.00)***
	K means group #2	γ_{01} (SE)		-.71 (1.87)	-1.07 (2.17)
	K means group #4	γ_{02} (SE)		-1.16 (2.36)	-1.82 (2.71)
	Treatment	γ_{03} (SE)		.33 (1.33)	.28 (1.33)
	Month 18	γ_{04} (SE)			-.21 (.10)*
	Group2 * month Centered at FA2	γ_{05} (SE)			-.03 (.11)
	Group4 * month Centered at FA2	γ_{06} (SE)			-.09 (.13)
Random Effects		Parameter	Std Dev.	Std Dev.	Std Dev.
	Childid (Group)	Intercept	7.47	7.55	7.64
		Residual	5.97	5.97	5.66
Grouping Variables		# of Groups	ICC	ICC	ICC
	Childid	161	0.61	0.62	0.65
Model Information					
	Observations		510	510	510
	AIC		3553.82	3551.06	3527.35
	BIC		3566.52	3576.46	3565.46
	Pseudo-R^2 (Fixed Effects)		0	0	0.03
	Pseudo-R^2 (Random Effects)		0.61	0.62	0.66
Model Comparisons					
	Log Likelihood		-1774.4	-1774.2	-1754.4
	X^2			0.3	39.79***
	$P > X^2$			0.96	0

*Note: *** $p < .001$, ** $p < .01$, * $p < .05$,* † $p < .10$

Table B.28 Children's Report of Posttraumatic Symptoms HLM Models Using K-Means Grouping-YS

	Parameter	Intercepts Only Model	Group and Txnum as predictors	Group * Time centered at FA2
Fixed Effects				
Intercept	γ_{00} (SE)	19.13 (.60)***	18.45 (2.21)***	15.86 (1.12)***
K means group #2	γ_{01} (SE)		.64 (2.21)	.60 (2.78)
K means group #3	γ_{02} (SE)		1.05 (1.57)	2.05 (1.95)
K means group #4	γ_{03} (SE)		1.66 (2.03)	1.59 (2.43)
Treatment	γ_{04} (SE)		.46 (1.22)	.32 (1.22)
Month 18	γ_{05} (SE)			-.26 (.05)**
Group2 * month Centered at FA2	γ_{06} (SE)			.01 (.16)
Group3 * month Centered at FA2	γ_{07} (SE)			.11 (.11)
Group4 * month Centered at FA2	γ_{08} (SE)			-.02 (.14)
Random Effects	Parameter	Std Dev.	Std Dev.	Std Dev.
Childid (Group)	Intercept	6.66	6.74	6.8
	Residual	6.59	6.59	6.33
Grouping Variables	# of Groups	ICC	ICC	ICC
Childid	162	0.51	0.51	0.54
Model Information				
Observations		524	524	524
AIC		3698.3	3693.64	3678.89
BIC		3711.08	3723.47	3725.77
Pseudo-R^2 (Fixed Effects)		0	0	0.04
Pseudo-R^2 (Random Effects)		0.51	0.51	0.55
Model Comparisons				
Log Likelihood		-1846.6	-1846	-1829
X^2			1.15	33.93***
$P > X^2$			0.89	0

*Note: *** $p < .001$, ** $p < .01$, * $p < .05$,* † $p < .10$

Table B.29 Children's Report of Posttraumatic Symptoms HLM Models Using LCA Grouping-OS

	Parameter	Intercepts Only Model	Group and Txnum as predictors	Group * Time centered at FA2
Fixed Effects				
Intercept	γ_{00} (SE)	18.15 (.65)***	17.08 (1.18)***	15.18 (1.30)***
LCA group #2	γ_{01} (SE)		1.60 (1.31)	.47 (1.53)
Treatment	γ_{02} (SE)		.50 (1.31)	.42 (1.31)
Month 18	γ_{03} (SE)			-.19 (.05)***
Group * month Centered at FA2	γ_{04} (SE)			-.11 (.08)
Random Effects	Parameter	Std Dev.	Std Dev.	Std Dev.
Childid (Group)	Intercept	7.48	7.49	7.6
	Residual	5.95	5.95	5.63
Grouping Variables	# of Groups	ICC	ICC	ICC
Childid	162	0.61	0.61	0.65
Model Information				
Observations		513	513	513
AIC		3573.2	3570.88	3541.88
BIC		3585.92	3592.08	3571.56
Pseudo-R^2 (Fixed Effects)		0	0.01	0.04
Pseudo-R^2 (Random Effects)		0.61	0.62	0.66
Model Comparisons				
Loglikelihood			-1783.3	-1762.8
X^2			1.6065	41.041
Pr (>X^2)			0.4479	.000***

*Note: *** p < .001, ** p < .01, * p < .05*

Table B.30 Children's Report of Posttraumatic Symptoms HLM Models Using LCA Grouping-YS

	Parameter	Intercepts Only Model	Group and Txnum as predictors	Group * Time centered at FA2
Fixed Effects				
Intercept	γ_{00} (SE)	19.13 (.60)***	18.05 (1.09)***	16.01 (1.29)***
LCA group #2	γ_{01} (SE)		1.51 (1.22)	.86 (1.51)
Treatment	γ_{02} (SE)		.40 (1.21)	.26 (1.21)
Month 18	γ_{03} (SE)			-.20 (.07)**
Group * month Centered at FA2	γ_{04} (SE)			-.08 (.09)
Random Effects	Parameter	Std Dev.	Std Dev.	Std Dev.
Childid (Group)	Intercept	6.66	6.66	6.73
	Residual	6.59	6.59	6.31
Grouping Variables	# of Groups	ICC	ICC	ICC
Childid	162	0.51	0.51	0.53
Model Information:				
Observations:		524	524	524
AIC:		3698.3	3696.14	3673.68
BIC:		3711.08	3717.45	3703.51
Pseudo-R^2 (Fixed Effects)		0	0.01	0.04
Pseudo-R^2 (Random Effects)		0.51	0.51	0.55
Model Comparisons				
Loglikelihood		-1846.6	-1845.7	-1828.7
X^2			1.72	34.06***
$P > X^2$			0.43	0

*Note: *** p < .001, ** p < .01, * p < .05*

Table B.31 Hopelessness Scale Score HLM Models Using HACA Grouping-OS

	Parameter	Intercepts Only Model	Group and Txnum as predictors	Group * Time centered at FA2
Fixed Effects				
Intercept	γ_{00} (SE)	29.54 (.47)***	29.56 (.69)***	29.35 (.80)***
HAC group #2	γ_{01} (SE)		2.81 (1.09)*	1.13 (1.37)
Treatment	γ_{02} (SE)		-1.27 **(**.92**)**	-1.31 **(**.92**)**
Month 18	γ_{03} (SE)		-1.27 **(**.92**)**	-.02 **(**.04**)**
Group * month Centered at FA2	γ_{04} (SE)			-.17 (.08)*
Random Effects	Parameter	Std Dev.	Std Dev.	Std Dev.
Childid (Group)	Intercept	5	4.88	4.9
	Residual	5.2	5.2	5.15
Grouping Variables	# of Groups	ICC	ICC	ICC
Childid	160	0.48	0.47	0.48
Model Information				
Observations		502	502	502
AIC		3296.23	3288.61	3293.37
BIC		3308.89	3309.7	3322.9
Pseudo-R^2 (Fixed Effects)		0	0.03	0.04
Pseudo-R^2 (Random Effects)		0.48	0.49	0.5
Model Comparisons				
Log Likelihood		-1645.3	-1641.3	-1637.6
X^2			8.01*	7.31*
$P > X^2$			0.02	0.03

*Note: *** p < .001, ** p < .01, * p < .05,* † p < .10

Table B.32 Hopelessness Scale Score HLM Models Using HACS Grouping-YS

	Parameter	Intercepts Only Model	Group and Txnum as predictors	Group * Time centered at FA2
Fixed Effects				
Intercept	γ_{00} (SE)	30.02 (.45)***	29.85 (.69)***	28.00 (.80)***
HAC group #2	γ_{01} (SE)		-.12 (1.33)	3.09 (1.73)†
HAC group #3	γ_{02} (SE)		.84 (1.62)	1.73 (.91)
Treatment	γ_{03} (SE)		.22 (.92)	.17 (.91)
Month 18	γ_{04} (SE)			-.19 (.04)***
Group2 * month Centered at FA2	γ_{05} (SE)			.32 (.11)***
Group3 * month Centered at FA2	γ_{06} (SE)			.09 (.13)
Random Effects	Parameter	Std Dev.	Std Dev.	Std Dev.
Childid (Group)	Intercept	4.68	4.74	4.68
	Residual	5.65	5.64	5.53
Grouping Variables	# of Groups	ICC	ICC	ICC
Childid	160	0.41	0.41	0.42
Model Information				
Observations		502	502	502
AIC		3346.5	3345.28	3339.73
BIC		3359.16	3370.59	3377.7
Pseudo-R^2 (Fixed Effects)		0	0	0.03
Pseudo-R^2 (Random Effects)		0.41	0.41	0.43
Model Comparisons				
Log Likelihood		-1834.7	-1830.4	-1813.4
X^2			8.57*	33.92***
P >X^2			0.04	0

*Note: *** p < .001, ** p < .01, * p < .05,* † p < .10

Table B.33 Hopelessness Scale Score HLM Models Using K-Means Grouping-OS

	Parameter	Intercepts Only Model	Group and Txnum as predictors	Group * Time centered at FA2
Fixed Effects				
Intercept	γ_{00} (SE)	29.54 (.46)***	30.73 (1.23)***	29.10 (1.52)***
K means group #2	γ_{01} (SE)		-.52 (1.32)	.64 (1.65)
K means group #4	γ_{02} (SE)		-1.80 (1.66)	-.47 (2.06)
Treatment	γ_{03} (SE)		-1.06 (.93)	-1.07 (.94)
Month 18	γ_{04} (SE)			-.16 (.09)†
Group2 * month Centered at FA2	γ_{05} (SE)			.11 (.10)
Group4 * month Centered at FA2	γ_{06} (SE)			.13 (.12)
Random Effects	Parameter	Std Dev.	Std Dev.	Std Dev.
Childid (Group)	Intercept	4.98	4.98	5.03
	Residual	5.19	5.2	5.17
Grouping Variables	# of Groups	ICC	ICC	ICC
Childid	161	0.48	0.48	0.49
Model Information				
Observations		504	504	504
AIC		3308.04	3304.88	3316.85
BIC		3320.71	3330.22	3354.86
Pseudo-R^2 (Fixed Effects)		0	0.01	0.02
Pseudo-R^2 (Random Effects)		0.48	0.48	0.49
Model Comparisons				
Log Likelihood		-1651.2	-1649.8	-1647.4
X^2			2.82	4.65
P >X^2			0.42	0.2

*Note: *** p < .001, ** p < .01, * p < .05,* † p < .10

Table B.34 Hopelessness Scale Score HLM Models Using K-Means Grouping-OS

	Parameter	Intercepts Only Model	Group and Txnum as predictors	Group * Time centered at FA2
Fixed Effects				
Intercept	γ_{00} (SE)	30.00 (.45)***	29.50 (.74)***	28.09 (.87)***
K means group #2	γ_{01} (SE)		.78 (1.68)	-.31 (2.25)
K means group #3	γ_{02} (SE)		.49 (1.17)	.32 (1.54)
K means group #4	γ_{03} (SE)		1.95 (1.50)	3.76 (1.90)†
Treatment	γ_{04} (SE)		.25 (.91)	.14 (.90)
Month 18	γ_{05} (SE)			-.15 (.05)**
Group2 * month Centered at FA2	γ_{06} (SE)			-.10 (.15)
Group3 * month Centered at FA2	γ_{07} (SE)			-.01 (.10)
Group4 * month Centered at FA2	γ_{08} (SE)			.18 (.12)
Random Effects	Parameter	Std Dev.	Std Dev.	Std Dev.
Childid (Group)	Intercept	4.67	4.71	4.69
	Residual	5.63	5.63	5.55
Grouping Variables	# of Groups	ICC	ICC	ICC
Childid	161	0.41	0.41	0.42
Model Information				
Observations		505	505	505
AIC		3364.08	3360.93	3364.99
BIC		3376.75	3390.5	3411.46
Pseudo-R^2 (Fixed Effects)		0	0.01	0.03
Pseudo-R^2 (Random Effects)		0.41	0.42	0.43
Model Comparisons				
Log Likelihood		-1679.2	-1678.2	-1670.2
X^2			1.97	16.06**
$P > X^2$			0.74	0

*Note: *** p < .001, ** p < .01, * p < .05,* † p < .10

Table B.35 Hopelessness Scale HLM Models Using LCA Grouping-OS

	Parameter	Intercepts Only Model	Group and Txnum as predictors	Group * Time centered at FA2
Fixed Effects				
Intercept	γ_{00} (SE)	29.50 (.46)***	30.60 (.83)***	29.65 (.97) ***
LCA group #2	γ_{01} (SE)		-1.06 (.92)	-.42 (1.17)
Treatment	γ_{02} (SE)		-1.10 (92)	-1.12 (.93)
Month 18	γ_{03} (SE)			-.09 (.05)†
Group * month Centered at FA2	γ_{04} (SE)			.06 (.07)
Random Effects	Parameter	Std Dev.	Std Dev.	Std Dev.
Childid (Group)	Intercept	4.99	4.98	5.01
	Residual	5.18	5.18	5.16
Grouping Variables	# of Groups	ICC	ICC	ICC
Childid	162	0.48	0.48	0.49
Model Information				
Observations		507	507	507
AIC		3326.32	3324.44	3332.78
BIC		3339	3345.58	3362.38
Pseudo-R^2 (Fixed Effects)		0	0.01	0.01
Pseudo-R^2 (Random Effects)		0.48	0.49	0.49
Model Comparisons				
Log Likelihood		-1660.3	-1659	-1657
X^2			2.55	4.07
$P > X^2$			0.279	0.1307

Note: *** $p < .001$, ** $p < .01$, * $p < .05$, † $p < .10$

Table B.36 Hopelessness Scale HLM Models Using LCA Grouping-YS

	Parameter	Intercepts Only Model	Group and Txnum as predictors	Group * Time centered at FA2
Fixed Effects				
Intercept	γ_{00} (SE)	30.00 (.45)***	30.31 (.82)***	28.71 (1.01)***
LCA group #2	γ_{01} (SE)		-.85 (.92)	-.39 (1.20)
Treatment	γ_{02} (SE)		.37 (.91)	.30 (.90)
Month 18	γ_{03} (SE)			-.16 (.06)*
Group * month Centered at FA2	γ_{04} (SE)			.04 (.08)
Random Effects	Parameter	Std Dev.	Std Dev.	Std Dev.
Childid (Group)	Intercept	4.67	4.68	4.67
	Residual	5.63	5.63	5.56
Grouping Variables	# of Groups	ICC	ICC	ICC
Childid	161	0.41	0.41	0.41
Model Information				
Observations		505	505	505
AIC		3364.08	3363.8	3362.81
BIC		3376.75	3384.92	3392.38
Pseudo-R^2 (Fixed Effects)		0	0	0.02
Pseudo-R^2 (Random Effects)		0.41	0.41	0.42
Model Comparisons				
Log Likelihood		-1679.2	-1678.7	-1672.1
X^2			0.99	13.05**
P >X^2			0.61	0.001

*Note: *** p < .001, ** p < .01, * p < .05,* † p < .10

Table B.37 CBCL Total Raw Score HLM Models Using HACA Grouping-OS

	Parameter	Intercepts Only Model	Group and Txnum as predictors	Group * Time centered at FA2
Fixed Effects				
Intercept	γ_{00} (SE)	46.24 (2.25)***	49.83 (3.39)***	47.61 (3.78)***
HAC group #2	γ_{01} (SE)		-4.92 (5.37)	-9.61 (6.41)
Treatment	γ_{02} (SE)		-4.84 (4.52)	-5.26 (4.54)
Month 18	γ_{03} (SE)			-.22 (.16)
Group * month Centered at FA2	γ_{04} (SE)			-.43 (.32)
Random Effects	Parameter	Std Dev.	Std Dev.	Std Dev.
Childid (Group)	Intercept	25.39	25.39	25.62
	Residual	19.46	19.45	19.23
Grouping Variables	# of Groups	ICC	ICC	ICC
Childid	157	0.63	0.63	0.64
Model Information				
Observations		459	459	459
AIC		4300.42	4292.23	4291.3
BIC		4312.81	4312.88	4320.2
Pseudo-R^2 (Fixed Effects)		0	0.01	0.02
Pseudo-R^2 (Random Effects)		0.63	0.63	0.65
Model Comparisons				
Log Likelihood		-2148.9	-2147.9	-2144.1
X^2			2.16	7.5*
P >X^2			0.34	0.02

*Note: *** p < .001, ** p < .01, * p < .05,* † p < .10

Table B.38 CBCL Total Raw Score HLM Models Using HACA Grouping-YS

	Parameter	Intercepts Only Model	Group and Txnum as predictors	Group * Time centered at FA2
Fixed Effects				
Intercept	γ_{00} (SE)	45.37 (2.38)***	47.88 (3.63)***	45.53 (3.92)***
HAC group #2	γ_{01} (SE)		-5.40 (6.99)	-6.01 (8.07)
HAC group #3	γ_{02} (SE)		1.90 (.82)	9.14 (10.12)
Treatment	γ_{03} (SE)		-3.82 (4.79)	-3.89 (4.79)
Month 18	γ_{04} (SE)			-.23 (.15)
Group2 * month Centered at FA2	γ_{05} (SE)			-.05 (.38)
Group3 * month Centered at FA2	γ_{06} (SE)			.64 (.48)
Random Effects	Parameter	Std Dev.	Std Dev.	Std Dev.
Childid (Group)	Intercept	27.88	28.04	28.06
	Residual	18.52	18.52	18.49
Grouping Variables:	# of Groups	ICC	ICC	ICC
Childid	160	0.69	0.7	0.7
Model Information:				
Observations		493	493	493
AIC		4602.43	4590.36	4594.48
BIC		4615.04	4615.57	4632.29
Pseudo-R^2 (Fixed Effects)		0	0.01	0.01
Pseudo-R^2 (Random Effects)		0.69	0.7	0.7
Model Comparisons				
Log Likelihood		-2300	-2299.3	-2297.4
X^2			1.34	3.91
$P > X^2$			0.72	0.27

*Note: *** p < .001, ** p < .01, * p < .05,* † p < .10

Table B.39 CBCL Scale Total Raw Score HLM Models Using K-Means Grouping-OS

	Parameter	Intercepts Only Model	Group and Txnum as predictors	Group * Time centered at FA2
Fixed Effects				
Intercept	γ_{00} (SE)	46.34 (2.24)***	51.83 (6.00)***	46.70 (7.36)***
K means group #2	γ_{01} (SE)		-5.74 (6.4)	-2.79 (7.90)
K means group #4	γ_{02} (SE)		5.74 (8.05)	4.10 (9.67)
Treatment	γ_{03} (SE)		-4.79 (4.48)	-5.06 (4.51)
Month 18	γ_{04} (SE)			-.45 (.37)
Group2 * month Centered at FA2	γ_{05} (SE)			.24 (41)
Group4 * month Centered at FA2	γ_{06} (SE)			-.25 (.49)
Random Effects	Parameter	Std Dev.	Std Dev.	Std Dev.
Childid (Group)	Intercept	25.34	25.07	25.34
	Residual	19.44	19.45	19.23
Grouping Variables	# of Groups	ICC	ICC	ICC
Childid	158	0.63	0.62	0.63
Model Information				
Observations		461	461	461
AIC		4318.13	4303.14	4303.57
BIC		4330.53	4327.94	4340.77
Pseudo-R^2 (Fixed Effects)		0	0.03	0.03
Pseudo-R^2 (Random Effects)		0.63	0.63	0.65
Model Comparisons				
Log Likelihood		-2157.8	-2155.2	-2151.2
X^2			5.23	7.89*
$P > X^2$			0.16	0.05

*Note: *** p < .001, ** p < .01, * p < .05,* † p < .10

Table B.40 CBCL Scale Total Raw Score HLM Models Using K-Means Grouping-YS

	Parameter	Intercepts Only Model	Group and Txnum as predictors	Group * Time centered at FA2
Fixed Effects				
Intercept	γ_{00} (SE)	45.24 (2.37)***	40.80 (3.76)***	38.52 (4.10)***
K means group #2	γ_{01} (SE)		11.71 (8.45)	20.59 (10.14)*
K means group #3	γ_{02} (SE)		15.13 (5.90)*	16.23 (6.95)*
K means group #4	γ_{03} (SE)		21.34 (7.67)*	18.07 (8.84)*
Treatment	γ_{04} (SE)		-3.72 (4.61)	-3.73 (4.61)
Month 18	γ_{05} (SE)			-.22 (.16)
Group2 * month Centered at FA2	γ_{06} (SE)			.81 (.50)
Group3 * month Centered at FA2	γ_{07} (SE)			.11 (.33)
Group4 * month Centered at FA2	γ_{08} (SE)			-.31 (.42)
Random Effects	Parameter	Std Dev.	Std Dev.	Std Dev.
Childid (Group)	Intercept	27.84	26.95	26.92
	Residual	18.47	18.47	18.44
Grouping Variables	# of Groups	ICC	ICC	ICC
Childid	161	0.69	0.68	0.68
Model Information				
Observations		496	496	496
AIC		4628.11	4601.07	4605.86
BIC		4640.73	4630.51	4652.13
Pseudo-R^2 (Fixed Effects)		0	0.06	0.06
Pseudo-R^2 (Random Effects)		0.69	0.7	0.7
Model Comparisons				
Log Likelihood		-2312.8	-2306.4	-2302.7
X^2			12.96*	5.4
P >X^2			0.01	0.25

*Note: *** p < .001, ** p < .01, * p < .05,* † p < .10

Table B.41 CBCL Total Raw Score HLM Models Using LCA Grouping-OS

	Parameter	Intercepts Only Model	Group and Txnum as predictors	Group * Time centered at FA2
Fixed Effects				
Intercept	γ_{00} (SE)	46.08 (2.24)***	39.99 (3.85)***	38.32 (4.37)***
LCA group #2	γ_{01} (SE)		15.71 (4.32)***	12.51 (5.24)*
Treatment	γ_{02} (SE)		-3.79 (4.32)	-4.20 (4.35)
Month 18	γ_{03} (SE)			-.18 (.19)
Group * month Centered at FA2	γ_{04} (SE)			-.29 (.27)
Random Effects	Parameter	Std Dev.	Std Dev.	Std Dev.
Childid (Group)	Intercept	25.45	24.26	24.52
	Residual	19.37	19.38	19.17
Grouping Variables	# of Groups	ICC	ICC	ICC
Childid	159	0.63	0.61	0.62
Model Information				
Observations		464	464	464
AIC		4345.21	4325.73	4325.95
BIC		4357.63	4346.43	4354.93
Pseudo-R^2 (Fixed Effects)		0	0.07	0.07
Pseudo-R^2 (Random Effects)		0.63	0.64	0.65
Model Comparisons				
Log Likelihood		-2171.3	-2164.3	-2161
X^2			14.059	6.685
$P > X^2$			.000***	.035*

*Note: *** $p < .001$, ** $p < .01$, * $p < .05$,* † $p < .10$

Table B.42 CBCL Total Raw Score HLM Models Using LCA Grouping-YS

	Parameter	Intercepts Only Model	Group and Txnum as predictors	Group * Time centered at FA2
Fixed Effects				
Intercept	γ_{00} (SE)	45.24 (2.37)***	56.30 (4.11)***	54.47 (4.66)***
LCA group #2	γ_{01} (SE)		-17.17 (4.65)***	-17.08 (5.44)***
Treatment	γ_{02} (SE)		-2.02 (4.58)	-2.15 (4.60)
Month 18	γ_{03} (SE)			-.17 (.20)
Group * month Centered at FA2	γ_{04} (SE)			0.00 (.26)
Random Effects	Parameter	Std Dev.	Std Dev.	Std Dev.
Childid (Group)	Intercept	27.84	26.67	26.78
	Residual	18.47	18.47	18.44
Grouping Variables	# of Groups	ICC	ICC	ICC
Childid	161	0.69	0.68	0.68
Model Information				
Observations		496	496	496
AIC		4628.11	4608.55	4613.84
BIC		4640.73	4629.58	4643.29
Pseudo-R^2 (Fixed Effects)		0	0.07	0.07
Pseudo-R^2 (Random Effects)		0.69	0.7	0.7
Model Comparisons				
Log Likelihood		-2312.8	-2305.9	-2305
X^2			13.88**	1.82
P >X^2			0	0.4

*Note: *** p < .001, ** p < .01, * p < .05,* † p < .10

Table B.43 CBCL Internalizing Raw Score HLM Models using HACA grouping-OS

	Parameter	Intercepts Only Model	Group and Txnum as predictors	Group * Time centered at FA2
Fixed Effects				
Intercept	γ_{00} (SE)	10.86 (.56)***	11.44 (.84)***	11.11 (.97)***
HAC group #2	γ_{01} (SE)		-.69 (1.34)	-2.86 (1.66)†
Treatment	γ_{02} (SE)		-.83 (1.13)	-.95 (1.13)
Month 18	γ_{03} (SE)			-.04 (.04)
Group * month Centered at FA2	γ_{04} (SE)			-.20 (.09)*
Random Effects	Parameter	Std Dev.	Std Dev.	Std Dev.
Childid (Group)	Intercept	6.09	6.12	6.19
	Residual	5.55	5.55	5.46
Grouping Variables	# of Groups	ICC	ICC	ICC
Childid	157	0.55	0.55	0.56
Model Information				
Observations		459	459	459
AIC		3108.67	3107.31	3109.28
BIC		3121.05	3127.96	3138.18
Pseudo-R^2 (Fixed Effects)		0	0	0.01
Pseudo-R^2 (Random Effects)		0.55	0.55	0.57
Model Comparisons				
Log Likelihood		-1551.7	-1551.2	-1546.4
X^2			0.88	9.65**
P >X^2			0.65	0.01

*Note: *** p < .001, ** p < .01, * p < .05,* † p < .10

Table B.44 CBCL Internalizing Raw Score HLM Models using HACA grouping-YS

	Parameter	Intercepts Only Model	Group and Txnum as predictors	Group * Time centered at FA2
Fixed Effects				
Intercept	γ_{00} (SE)	9.66 (.56)***	9.72 (.86)***	8.96 (.97)***
HAC group #2	γ_{01} (SE)		.16 (1.66)	-.97 (2.04)
HAC group #3	γ_{02} (SE)		.23 (2.01)	2.26 (2.60)
Treatment	γ_{03} (SE)		-.19 (1.14)	-.23 (1.14)
Month 18	γ_{04} (SE)			-.07 (.04)†
Group2 * month Centered at FA2	γ_{05} (SE)			-.10 (.11)
Group3 * month Centered at FA2	γ_{06} (SE)			.18 (.14)
Random Effects	Parameter	Std Dev.	Std Dev.	Std Dev.
Childid (Group)	Intercept	6.31	6.38	6.42
	Residual	5.51	5.51	5.47
Grouping Variables	# of Groups	ICC	ICC	ICC
Childid	160	0.57	0.57	0.58
Model Information				
Observations		493	493	493
AIC		3338.07	3335.88	3344.62
BIC		3350.68	3361.09	3382.42
Pseudo-R^2 (Fixed Effects)		0	0	0.01
Pseudo-R^2 (Random Effects)		0.57	0.57	0.58
Model Comparisons				
Log Likelihood		-1666.4	-1666.4	-1663
X^2			0.05	6.61†
P >X^2			0.997	0.09

*Note: *** p < .001, ** p < .01, * p < .05,* † p < .10

Table B.45 CBCL Scale Internal Raw Score HLM Models Using K-Means Grouping-YS

	Parameter	Intercepts Only Model	Group and Txnum as predictors	Group * Time centered at FA2
Fixed Effects				
Intercept	γ_{00} (SE)	9.62 (.56)***	8.45 (.91)***	7.65 (1.03)***
K means group #2	γ_{01} (SE)		2.88 (2.05)	6.32 (2.62)*
K means group #3	γ_{02} (SE)		3.49 (1.43)*	3.41 (1.78)†
K means group #4	γ_{03} (SE)		2.48 (1.85)	.95 (2.26)
Treatment	γ_{04} (SE)		-.08 (1.11)	-.09 (1.11)
Month 18	γ_{05} (SE)			-.08 (.05)
Group2 * month Centered at FA2	γ_{06} (SE)			.31 (.15)*
Group3 * month Centered at FA2	γ_{07} (SE)			0 (.10)
Group4 * month Centered at FA2	γ_{08} (SE)			-.15 (.12)
Random Effects	Parameter	Std Dev.	Std Dev.	Std Dev.
Childid (Group)	Intercept	6.31	6.22	6.23
	Residual	5.49	5.49	5.44
Grouping Variables	# of Groups	ICC	ICC	ICC
Childid	161	0.57	0.56	0.57
Model Information				
Observations		496	496	496
AIC		3356.42	3346	3355.7
BIC		3369.04	3375.44	3401.97
Pseudo-R^2 (Fixed Effects)		0	0.03	0.04
Pseudo-R^2 (Random Effects)		0.57	0.58	0.59
Model Comparisons				
Log Likelihood		-1675.5	-1671.7	-1666.6
X^2			7.66	10.29*
$P > X^2$			0.11	0.04

*Note: *** $p < .001$, ** $p < .01$, * $p < .05$,* † p < .10

Table B.46 CBCL Total Internalizing Score HLM Models Using LCA Grouping-OS

	Parameter	Intercepts Only Model	Group and Txnum as predictors	Group * Time centered at FA2
Fixed Effects				
Intercept	γ_{00} (SE)	10.79 (.56)***	9.76 (.98)***	9.46 (1.14)***
LCA group #2	γ_{01} (SE)		2.58 (1.1)*	2.04 (1.38)
Treatment	γ_{02} (SE)		-.56 (1.1)	-.66 (1.11)
Month 18	γ_{03} (SE)			-.06 (.05)
Group * month Centered at FA2	γ_{04} (SE)			-.05 (.08)
Random Effects	Parameter	Std Dev.	Std Dev.	Std Dev.
Childid (Group)	Intercept	6.1	6.01	6.06
	Residual	5.53	5.52	5.48
Grouping Variables	# of Groups	ICC	ICC	ICC
Childid	159	0.55	0.54	0.55
Model Information				
Observations		464	464	464
AIC		3140.75	3134.84	3141.58
BIC		3153.17	3155.54	3170.55
Pseudo-R^2 (Fixed Effects)		0	0.03	0.03
Pseudo-R^2 (Random Effects)		0.55	0.55	0.56
Model Comparisons				
Log Likelihood		-1567.7	-1564.8	-1562.2
X^2			5.89†	5.21†
$P > X^2$			0.05	0.07

*Note: *** p < .001, ** p < .01, * p < .05,* † p < .10

Table B.47 CBCL Total Internalizing Score HLM Models Using LCA Grouping-YS

	Parameter	Intercepts Only Model	Group and Txnum as predictors	Group * Time centered at FA2
Fixed Effects				
Intercept	γ_{00} (SE)	9.62 (.56)***	11.16 (1.0)***	10.82 (1.19)***
LCA group #2	γ_{01} (SE)		-2.76 (1.13)*	-3.41 (1.40)*
Treatment	γ_{02} (SE)		.13 (1.12)	.08 (1.12)
Month 18	γ_{03} (SE)			-.03 (.06)
Group * month Centered at FA2	γ_{04} (SE)			-.06 (.08)
Random Effects	Parameter	Std Dev.	Std Dev.	Std Dev.
Childid (Group)	Intercept	6.31	6.23	6.27
	Residual	5.49	5.49	5.46
Grouping Variables	# of Groups	ICC	ICC	ICC
Childid	161	0.57	0.56	0.57
Model Information				
Observations		496	496	496
AIC		3356.42	3350.39	3358.06
BIC		3369.04	3371.42	3387.51
Pseudo-R^2 (Fixed Effects)		0	0.03	0.03
Pseudo-R^2 (Random Effects)		0.57	0.57	0.58
Model Comparisons				
Log Likelihood		-1675.5	-1672.6	-1670.4
X^2			5.94†	4.33
$P > X^2$			0.05	0.11

*Note: *** p < .001, ** p < .01, * p < .05,* † p < .10

Table B.48 CBCL Externalizing Raw Score HLM Models Using HACA Grouping-OS

	Parameter	Intercepts Only Model	Group and Txnum as predictors	Group * Time centered at FA2
Fixed Effects				
Intercept	γ_{00} (SE)	15.10 (.89)***	16.03 (1.34)***	15.21 (1.49)***
HAC group #2	γ_{01} (SE)		-.08 (2.13)	-1.49 (2.52)
Treatment	γ_{02} (SE)		-1.80 (1.79)	-1.94 (1.79)
Month 18	γ_{03} (SE)			-.08 (.06)
Group * month Centered at FA2	γ_{04} (SE)			-.13 (.12)
Random Effects	Parameter	Std Dev.	Std Dev.	Std Dev.
Childid (Group)	Intercept	10.06	10.11	10.15
	Residual	7.53	7.52	7.47
Grouping Variables	# of Groups	ICC	ICC	ICC
Childid	157	0.64	0.64	0.65
Model Information				
Observations		459	459	459
AIC		3436.45	3433.08	3437.8
BIC		3448.83	3453.73	3466.7
Pseudo-R^2 (Fixed Effects)		0	0.01	0.01
Pseudo-R^2 (Random Effects)		0.64	0.65	0.65
Model Comparisons				
Log Likelihood		-1716	-1715.5	-1712.7
X^2			1.04	5.64†
$P > X^2$			0.6	0.06

*Note: *** p < .001, ** p < .01, * p < .05,* † p < .10

Table B.49 CBCL Externalizing Raw Score HLM Models Using HACA Grouping-YS

	Parameter	Intercepts Only Model	Group and Txnum as predictors	Group * Time centered at FA2
Fixed Effects				
Intercept	γ_{00} (SE)	14.23 (.81)***	15.00 (1.24)***	14.52 (1.35)***
HAC group #2	γ_{01} (SE)		-1.95 (2.39)	-1.45 (2.81)
HAC group #3	γ_{02} (SE)		.25 (2.87)	.55 (3.53)
Treatment	γ_{03} (SE)		-1.04 (1.64)	-1.06 (1.64)
Month 18	γ_{04} (SE)			-.05 (.05)
Group2 * month Centered at FA2	γ_{05} (SE)			.05 (.14)
Group3 * month Centered at FA2	γ_{06} (SE)			.03 (18)
Random Effects	Parameter	Std Dev.	Std Dev.	Std Dev.
Childid (Group)	intercept	9.42	9.48	9.49
	Residual	6.73	6.73	6.75
Grouping Variables	# of Groups	ICC	ICC	ICC
Childid	160	0.66	0.66	0.66
Model Information				
Observations		493	493	493
AIC		3586.94	3581.52	3594.81
BIC		3599.54	3606.73	3632.62
Pseudo-R^2 (Fixed Effects)		0	0.01	0.01
Pseudo-R^2 (Random Effects)		0.66	0.67	0.67
Model Comparisons				
Log Likelihood		-1791.2	-1790.6	-1790.2
X^2			1.12	0.78
P >X^2			0.85	0.85

*Note: *** p < .001, ** p < .01, * p < .05,* † p < .10

Table B.50 CBCL Scale External Raw Score HLM Models Using K-Means Grouping-YS

	Parameter	Intercepts Only Model	Group and Txnum as predictors	Group * Time centered at FA2
Fixed Effects				
Intercept	γ_{00} (SE)	14.18 (.81)***	12.71 (1.28)***	12.41 (1.41)***
K means group #2	γ_{01} (SE)		2.54 (2.89)	3.22 (3.53)
K means group #3	γ_{02} (SE)		4.47 (2.01)*	4.89 (2.42)*
K means group #4	γ_{03} (SE)		8.47 (2.62)**	6.82 (3.07)*
Treatment	γ_{04} (SE)		-1.09 (1.57)	-1.09 (1.57)
Month 18	γ_{05} (SE)			-.03 (.06)
Group2 * month Centered at FA2	γ_{06} (SE)			.06 (.18)
Group3 * month Centered at FA2	γ_{07} (SE)			.04 (.12)
Group4 * month Centered at FA2	γ_{08} (SE)			-.16 (.15)
Random Effects	Parameter	Std Dev.	Std Dev.	Std Dev.
Childid (Group)	Intercept	9.4	9.09	9.07
	Residual	6.71	6.71	6.73
Grouping Variables	# of Groups	ICC	ICC	ICC
Childid	161	0.66	0.65	0.64
Model Information				
Observations		496	496	496
AIC		3606.33	3587.44	3603.63
BIC		3618.95	3616.88	3649.9
Pseudo-R^2 (Fixed Effects)		0	0.06	0.06
Pseudo-R^2 (Random Effects)		0.66	0.67	0.67
Model Comparisons				
Log Likelihood		-1800.9	-1794.2	-1793.1
X^2			13.41**	2.07
$P > X^2$			0.01	0.72

*Note: *** p < .001, ** p < .01, * p < .05,* † p < .10

Table B.51 CBCL Total Externalizing Score HLM Models Using LCA Grouping-OS

	Parameter	Intercepts Only Model	Group and Txnum as predictors	Group * Time centered at FA2
Fixed Effects				
Intercept	γ_{00} (SE)	15.08 (.89)***	13.39 (1.55)***	13.03 (1.74)***
LCA group #2	γ_{01} (SE)		4.77 (1.74)*	3.22 (2.08)
Treatment	γ_{02} (SE)		-1.46 (1.74)	-1.61 (1.74)
Month 18	γ_{03} (SE)			-.04 (.07)
Group * month Centered at FA2	γ_{04} (SE)			-.14 (.10)
Random Effects	Parameter	Std Dev.	Std Dev.	Std Dev.
Childid (Group)	Intercept	10.1	9.84	9.91
	Residual	7.49	7.49	7.43
Grouping Variables	# of Groups	ICC	ICC	ICC
Childid	159	0.65	0.63	0.64
Model Information				
Observations		464	464	464
AIC		3471.81	3461.52	3466.03
BIC		3484.23	3482.22	3495
Pseudo-R^2 (Fixed Effects)		0	0.04	0.04
Pseudo-R^2 (Random Effects)		0.65	0.65	0.66
Model Comparisons				
Log Likelihood		-1733.7	-1729.5	-1726.4
X^2			8.48*	6.21*
$P > X^2$			0.01	0.04

*Note: *** p < .001, ** p < .01, * p < .05,* † p < .10

Table B.52 CBCL Total Externalizing Score HLM Models Using LCA Grouping-YS

	Parameter	Intercepts Only Model	Group and Txnum as predictors	Group * Time centered at FA2
Fixed Effects				
Intercept	γ_{00} (SE)	14.18 (.81)***	17.46 (1.42)***	16.79 (1.62)***
LCA group #2	γ_{01} (SE)		-5.17 (1.60)***	-4.65 (1.90)*
Treatment	γ_{02} (SE)		-.50 (1.58)	-.53 (1.58)
Month 18	γ_{03} (SE)			-.06 (.07)
Group * month Centered at FA2	γ_{04} (SE)			.05 (.09)
Random Effects	Parameter	Std Dev.	Std Dev.	Std Dev.
Childid (Group)	Intercept	9.4	9.11	9.12
	Residual	6.71	6.71	6.72
Grouping Variables	# of Groups	ICC	ICC	ICC
Childid	161	0.66	0.65	0.65
Model Information				
Observations		496	496	496
AIC		3606.33	3594.25	3604.63
BIC		3618.95	3615.28	3634.08
Pseudo-R^2 (Fixed Effects)		0	0.05	0.05
Pseudo-R^2 (Random Effects)		0.66	0.67	0.67
Model Comparisons				
Log Likelihood		-1800.9	-1795.5	-1795.2
X^2			10.64**	0.79
$P > X^2$			0.004	0.67

*Note: *** p < .001, ** p < .01, * p < .05,* † p < .10