

Factors Accounting for Change in Effective Parenting Following Homelessness

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## Dedication

To my parents, who encouraged me to turn “I think I can” into “I knew I could.”

### Abstract

When homeless, families experience disruptions that may compromise parents' abilities to demonstrate effective caregiving behaviors with their children. Consistently supportive parenting practices, however, are critical for children's adaptive development within highly stressful environments. Although supportive housing sites provide families with affordable, private housing, it is unknown if parenting practices change or remain stable as families navigate from homeless to housed status. The purpose of this study was to describe change in observed effective parenting practices of 229 formerly homeless parent-child dyads over three years, and to examine the role of individual and contextual factors in contributing to change processes. Mothers and children, enrolled in a randomized control trial, participated annually in 26-min of videotaped interaction tasks on four measurement occasions. Using second-order latent growth curve modeling, we examined growth in a latent factor of effective parenting. The effective parenting factor met assumptions of strong factorial invariance, providing evidence that change in the construct was attributed to true growth rather than measurement error. Results indicated that group-level effective parenting improved over time, although individuals demonstrated variability in change. A quadratic fixed factor model provided the best fit to the data; effective parenting increased, but improvements tapered off as time passed. Parents who reported lower levels of parenting self-efficacy at baseline experienced greater improvements in parenting. Perceived social support, participation in a prevention program, and history of residential instability did not predict growth. Results are discussed in the context of intervention and parenting in transition.

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### Factors Accounting for Change in Effective Parenting Following Homelessness

Confronted with residential instability, poverty, and stressful circumstances, homeless children are more vulnerable than housed children to a host of social, emotional, and behavior problems (Buckner, Bassuk, Weinreb, & Brooks, 1999; Gewirtz, Hart-Shegos, & Medhanie, 2008; Zima et al., 1999). In their homes and neighborhoods, they are exposed to higher rates of interpersonal violence, community violence, and other traumas (Bassuk, Weinreb, Dawson, Perloff, & Buckner, 1997; Vostanis, 2002). At school, they are confronted with social stigma and hold inconsistent attendance records, contributing to greater academic and social difficulties (Masten, Miliotis, Graham-Bermann, Ramirez, & Neeman, 1993). Further, studies of homeless and formerly homeless children suggest the effects of homelessness extend beyond the period of homelessness itself (Masten, Sesma, Si-Asar, Lawrence, Miliotis, & Dionne, 1997; Obradovic et al., 2009). Unfortunately, these risk factors intersect with critical periods for healthy cognitive and physical development (Anooshian, 2005).

Despite potential commonalities in contextual risks, the experiences of homeless children and their families are not one and the same (Huntington, Buckner, & Bassuk, 2008). The concept of multifinality, suggesting that risk factors can pave multiple pathways for development based on individuals' characteristics and the supports present in their environments (Cicchetti, 1996), explains why some children may experience more adverse effects from homelessness than others. Supportive parenting practices, the behavioral strategies caregivers use during parent-child interaction to promote their children's adjustment, are an important environmental factor offering children protection from stressful environments (Patterson, 1982). If homeless and highly mobile children

can rely upon the presence of a consistently warm and nurturing relationship with their primary caregivers, they may demonstrate resilience to the multiple losses in their environments (Masten et al., 1999). When parents experience multiple simultaneous stressors, however, families can experience changes in the quality of the parent-child relationship (Forgatch & DeGarmo, 2002; Conger & Donnellan, 2007; Webster-Stratton, 1990). Although supportive caregiving can protect children from environmental risk and stressful circumstances, it, too, can erode in the face of stress.

When homeless, parents may encounter a range of challenges that compromise their ability to respond consistently to their children's needs (Hausman & Hammen, 1993). Families, often sharing a single room with multiple unfamiliar families, are given limited privacy; their daily routines are subject to the sleep schedules, conflicts, and comings and goings of other residents. Other mothers and shelter staff may challenge a mother's parenting behaviors publicly, uprooting her sense of authority or self-efficacy with her child. Threatened by the possibility of eviction, parents are required to conform to schedules and guidelines set by program staff rather than make their own decisions for their families (Fonfield-Ayinla, 2009). Limited personal freedom, daily stress, and uncertainty around short-term circumstances can lead to emergence of depressive symptoms, or amplification of previously existing depression (Buckner, Bassuk, & Zima, 1993). The dehumanizing experience of homelessness may limit mothers' opportunities to interact positively with their children (Fonfield-Ayinla, 2009); we do not yet know if parenting continues to be compromised when families leave emergency shelters and secure more permanent housing.

Although research suggests that, on average, mothers experiencing homelessness report less supportive parenting practices than low-income housed mothers (Koblinsky, Morgan, & Anderson, 1997), homeless mothers also exhibit heterogeneity in parenting behaviors. Controlled studies comparing homeless and low-income housed families have illuminated important issues, but comparisons emphasize homogeneity among homeless families. Across samples and measurement methods, however, sampling distributions of parenting practices tend to be approximately normal, indicating a range of supportiveness in parenting among homeless mothers (e.g., Torquati, 2002; Gewirtz, DeGarmo, Plowman, August, & Realmuto, 2009). These studies provide preliminary evidence of diversity in the parenting practices of homeless and formerly homeless families. When interfamilial differences in the parent-child relationships of homeless families have been addressed directly, the discussion is primarily theoretical, lacking empirical attention (Swick & Williams, 2006). In the last two decades, researchers have investigated and debated typologies of homeless families, primarily considering risk factors for homelessness, duration of homelessness, and service needs (e.g., Danseco & Holden, 1998, Jahiel & Babor, 2005); these studies suggest patterns and processes of homelessness vary among families, but none focus specifically on parenting. Further, none describe parenting as families navigate their way back to permanent housing.

Diversity in the circumstances surrounding homelessness (e.g., chronicity, history) and personal resources (e.g., social support, parenting efficacy) may explain why some homeless parents are more able to exhibit supportive parenting practices than others. According to Bronfenbrenner's (1986) bioecological systems theory, individual, family-level, and environmental factors interact to influence a parent's ability to provide

supportive caregiving to her child. For example, variations in histories of family homelessness may relate to the quality of caregiving a parent is able to provide; families who experience chronic homelessness may possess different systemic resources or exhibit different characteristics than those who are homeless only temporarily. Individual psychological resources also influence parenting while homeless; for example, Torquati (2002) found that mothers' self-esteem fully mediated the relationship between stressful life events and unsupportive parenting. Considered together, theoretical and empirical findings suggest a complex interplay between individual, family, and environmental factors as determinants of parenting in the context of homelessness.

Our knowledge of parenting and homelessness is limited by the cross-sectional nature of existing research; because of definitional and methodological challenges surrounding homelessness (Bassuk et al., 1996), the majority of studies provide a single snapshot into the lives of homeless families. In the only longitudinal study of parenting in homeless families we could find, Marra et al. (2009) reported that both supportive and unsupportive self-reported parenting practices of unsheltered homeless mothers decreased very marginally over a 15-month period, however, they did not test this hypothesis directly (i.e., only descriptive statistics were provided). For some parents, parenting practices may recover following the crisis of homelessness, but for others, parenting practices may continue to exhibit lasting vulnerabilities to residential instability and poverty. Some families may demonstrate consistently supportive parenting behaviors. Longitudinal analysis of observed parenting is needed to better understand the nature of parenting following homelessness. Methods such as latent growth curve analysis (LGM) allow researchers to examine the rate of change or stability in behaviors (Preacher,

Wichman, MacCallum, & Briggs, 2008); in addition to permitting description of change (or stability) in parenting practices over time, LGM provides opportunity to explore interindividual differences in growth (i.e, intercept, slope).

Formerly homeless parents are understudied, yet they deserve attention from researchers because their children are at increased risk for development of emotional and behavioral problems. Supportive housing sites, serving high-risk segments of the population of homeless families, possess strong potential for effective psychosocial intervention due to timing of service delivery (Gewirtz, 2007). When families transition from living in emergency shelters (or unsheltered status) to receiving supportive housing, the influx of support and security offers good timing for intervention. Because theoretical (e.g., Patterson, 1982, Conger & Donnellan, 2007) and empirical evidence (Masten et al., 1999) suggest supportive parenting as a primary pathway for buffering children from environmental risk, parents are considered a target for prevention and intervention (Forgatch & Patterson, 2010). Garbarino, Vorrasi, and Kostelny (2002) articulately described parents as “windows of opportunity” for prevention and intervention with children. Parent education and prevention programs evaluated with families experiencing structural transitions suggest lasting effects supporting improved adjustment for multiple members of the family system. For example, Forgatch’s Parenting Through Change program (1994), founded upon the Parent Management Training-Oregon model (PMTO) but designed for mothers in recently separated families, has demonstrated both target and cascading effects nine years following implementation. Moreover, this program has been found to be feasible and acceptable when implemented with homeless families living in shelters (Gewirtz & Taylor, 2008).

Because supportive housing sites already deliver a plethora of services to families undergoing the transition from “homeless” to “housed”, they possess a unique avenue for parenting interventions or education programs. Pilot studies employing small shelter samples suggest some aspects of parenting in homeless families may be amenable to intervention when advocates are trained, but evidence is preliminary because of a lack of control groups or repeated measurements (Kelly, Beuhlman, & Caldwell, 2000; Gewirtz & Taylor). Describing change and variability in effective parenting following homelessness, and examining factors that contribute to change or stability, will allow researchers to design tailored interventions that uniquely address the needs of formerly homeless families (Swick & Williams, 2006).

To summarize, although researchers have explored stability and change in the parenting of low-income families (Forehand & Jones, 2002) and families experiencing transitions like separation and divorce (DeGarmo & Forgatch, 1999), none have examined the longitudinal nature of parenting for families with a history of recent homelessness. Further, only one study has described parenting quality in homeless families using observational analysis of parent-child interaction (Gewirtz et al., 2009), but this study used cross-sectional data. Finally, we could find no studies examining how individual and contextual factors, such as parenting self-efficacy or residential instability, predict change in parenting following homelessness.

Based on the identified gap in the field’s description of parenting in homeless families, the objectives of this study are to: a) describe the longitudinal nature of parenting practices in a sample of recently homeless families, and b) explore the degree

to which individual and contextual predictors explain variability in initial level of effective parenting practices and change in parenting over time.

Applying Patterson's (1982) social interaction learning theory and Bronfenbrenner's bioecological systems theory (1986), several factors likely contribute to stability or change in mothers' parenting practices following homelessness. In the section that follows, I describe the recent landscape of family homelessness in the United States and review potential predictors of effective parenting trajectories following recent homelessness. Then, I restate research questions and specify study hypotheses.

## Literature Review

### Families and Homelessness

Families with children are the fastest growing segment of the homeless population in the United States (National Alliance to End Homelessness, 2007). Fluctuations in the demographics of homeless families are associated with socioeconomic and political changes in local and national landscapes (Gould & Williams, 2010). Over the last two decades, the portrait of the “typical” homeless family has shifted from that of a single, middle-aged mother with adolescents to a young mother with one or two children under six years old (HUD Office of Community Planning and Development, July 2008; Nunez, 1998). In addition to living in poverty, many homeless mothers have endured various problems, such as mental health issues, violence exposure, substance use disorders, and traumatic event histories (Buckner, Bassuk, & Zima, 1993).

Families experiencing homelessness are categorized as sheltered (i.e., staying in crisis shelter, transitional housing, or supportive housing) or unsheltered (i.e., “doubled up” with family and friends, living in cars, on the streets; HUD Office of Community Planning and Development, July 2008). Due to the difficulty of accessing unsheltered families, the majority of research on family homelessness includes sheltered samples. For most sheltered families, a temporary or overnight shelter stay does not resolve homelessness; on average, families reside in an emergency shelter for 30 days and transitional housing for 151 days (HUD Office of Community Planning and Development, July 2008). In some states, implementation of the 1987 McKinney Homelessness Act has paved way for the creation of supportive housing, where eligible homeless families are able to obtain subsidized rent in conjunction with support services

(e.g., employment seeking, child care, referrals). Families are eligible recipients of supportive housing if they have a disability (e.g., mental health issue, substance use disorder) and have experienced chronic homelessness (Gewirtz, 2007). The extent and quality of support services offered to and utilized by families varies considerably by state, community, and supportive housing site.

Despite receiving permanent or semi-permanent housing combined with support services, families residing in supportive housing sites fall under the branch of sheltered homeless families (HUD Office of Community Planning and Development, July 2008). Little has been published about parent-child relationships of families residing in supportive housing, but statistics describing the psychosocial status of children and families indicate high frequencies of open child protection cases, caregiver mental health or substance use disorders, and children's witnessing of interpersonal violence (Gewirtz, Hart-Shegos, & Medhanie, 2008). Although most families living in supportive housing no longer face uncertainty of where they might be living the following day, their continued stress, past traumatic experiences, and persisting mental health issues can potentially disrupt effective caregiving provided in the home.

### **Parenting and Homelessness**

For both sheltered and unsheltered homeless families, homelessness can undermine parenting through three primary pathways: 1) stressful environmental circumstances resulting from the experience of homelessness; 2) individual and family-level factors that can contribute to a family's homeless status; and 3) bidirectional influences stemming from children's emotional and behavioral problems.

Social interaction learning perspectives suggest that when experiencing acute or chronic stress, transitions, or other adversities, parents may have a harder time responding sensitively to their children's needs (Forgatch & Patterson, 2010). Emphasizing the importance of consistent supportiveness in the parent-child relationship (Patterson, 1971), researchers have pinpointed specific parenting practices that are particularly influential in predicting child adjustment. *Problem solving skills* (Forgatch, 1989) are important for teaching children behavioral contingencies, understanding transmission of negative affect in the family, and scaffolding practical skills for child adjustment in everyday life. *Effective discipline* describes firm but warm, appropriate limit setting a parent establishes to teach her child prosocial behaviors (Patterson & Fisher, 2002). *Positive involvement* indicates the parent's supportive presence in the child's life, demonstrated through warmth, interest, and attention. *Skill encouragement* describes how a parent scaffolds a child through a specific task by positively reinforcing successes and on-task behavior. Consistency is the cornerstone to the effectiveness of these parenting practices because they teach children behavioral contingencies by reinforcing the behaviors that receive positive and negative attention (Patterson, 1971; Patterson, DeBaryshe, & Ramsey, 1989). When stressed, parents experience difficulty responding consistently and appropriately to their children's problematic (and prosocial) behaviors; because of the stresses in their own lives (e.g., transition, loss of support, depressed mood; Patterson & Forgatch, 1990; DeGarmo, Patterson, & Forgatch, 2004), they become more irritable and inconsistent in their interactions with children, unintentionally training their children to behave antisocially. The relationship between stress and disrupted parenting behaviors is well established (e.g., Conger & Donnellan,

2007) and theory suggests this relationship is amplified with the severe stress associated with homelessness for several reasons (Garbarino et al., 2002).

First, the experience of family homelessness is stressful and dehumanizing (Fonfield-Ayinla, 2009). Homeless mothers are faced with social stigma, economic hardship, and loss of self-worth (Torquati, 2004). They are also acutely aware of the disruption in their children's lives. Mothers living in emergency shelters have voiced concerns for their children's wellbeing, reporting feeling saddened by, and blaming themselves for, their school-aged children's experiences of hunger, chaotic environments, and academic and social difficulties at school (Choi & Snyder, 1999). When compared to low-income housed mothers, homeless mothers report experiencing higher levels of stress and depressive symptoms (Banyard & Graham-Bermann, 1998). Family stress models (Conger & Donnellan, 2007) suggest economic and social pressures influence caregiving behaviors through their impact on parental wellbeing. Additionally, beyond the lack of instrumental structure and security associated with having a home, researchers believe there is a valuable, but intangible, aspect of having a home that contributes to an individual's empowerment, wellbeing, and identity (Dupuis, 1998; Garbarino et al., 2002). Given the multiple sources of economic and psychological stressors in homeless parents' lives, it is not surprising that the supportiveness of parenting practices may fluctuate as families navigate the path back to having a permanent home.

To isolate the effects of housing status on parenting, most studies examining parenting while homeless compare low-income families with permanent housing to low-income families lacking housing (e.g., Koblinsky, Morgan, & Anderson, 1997; Bassuk et al., 1997). Findings are mixed based on the number and structure of comparison groups,

but the majority of research suggests that parenting while homeless is associated with unique risks over and above the effects of poverty. For example, because of the severe stress associated with homelessness, mothers face more difficulties in providing academically and socially stimulating environments for their children, display less warmth and affection, and provide less variety in experience than low-income housed mothers living in the same communities (Koblinsky et al., 1997). Bassuk and colleagues (1997) noted that both homeless and very low-income housed mothers self-reported lower quality parenting practices when compared to a housed, middle class sample.

Lacking material resources, homeless parents may have a difficult time fulfilling even their children's basic needs (Torquati, 2002); building a developmentally supportive and cognitively stimulating environment is a luxury many homeless parents cannot afford. Families with limited economic resources have more difficulties than wealthier parents providing learning materials, finding time to stimulate their children intellectually, and securing housing in safe locations (Bradley, Corwyn, McAdoo, & Garcia Coll, 2001). Even when compared to housed families with low SES, evaluations of homeless families' physical environments have revealed lower levels of developmental supportiveness in the physical environment (Hausmen and Hammen, 1993).

In addition to the experience of homelessness itself, risk factors for homelessness can also disrupt parenting. Like other family transitions (e.g., divorce), the process of homelessness may begin long before families face eviction or are uprooted from their homes for other reasons. For example, research indicates that homeless mothers are more likely to have childhood histories of homelessness, traumatic experiences, maternal drug use, and foster care placements (Bassuk, Perloff, & Dawson, 2001; Bassuk et al., 1996).

Along with poverty and recent eviction, other risk factors for homelessness include psychopathology, substance use disorders and recent drug use, and victimization from interpersonal violence.

Despite the heterogeneity of homeless families' circumstances and characteristics, one disadvantage all homeless families share is poverty (Jahiel & Babor, 2005). From a social interactional view of risk, disadvantaged socioeconomic status is among the background factors known to compromise effective parenting (Patterson, 1982; Conger & Donnellan, 2007). Although multiple studies suggest poverty directly and indirectly undermines the supportiveness of the parent-child relationship (for a review, see Conger & Donnellan, 2007), researchers know little about how parenting is influenced by the other stressors surrounding homelessness. Heterogeneity in patterns of homelessness, individual resources, and family-level characteristics may result in heterogeneity in parenting practices, or alternatively, the shared experience of poverty might influence individuals' parenting trajectories in similar ways. When it comes to parenting practices, researchers do not yet know if stress associated with homelessness influences parenting similarly across families or whether variation exists. Currently, no empirical studies have explored the diversity of parenting in homeless families, particularly from a longitudinal perspective.

Finally, the supportiveness of the parent-child relationship can also be compromised indirectly through the effects of homelessness on children's wellbeing and behavior. Homeless and formerly homeless children, facing more stressors than their housed, middle-SES counterparts, experience higher rates of emotional and behavior problems (Buckner, Bassuk, Weinreb, & Brooks, 1999; Gewirtz, Hart-Shegos, &

Medhanie, 2008). Transactional patterns of the parent-child relationship suggest a bidirectional quality of the parent-child relationship (Lollis & Kuczynski, 2007), where children (and their behavior) have mutual influence on the behaviors of caregivers. When children are repeatedly disruptive and parents are highly stressed, a cycle of coercive behaviors and ineffective discipline strategies may emerge in some families (Patterson, 1982). To summarize, disruption of supportive, effective parenting practices may stem from several avenues.

### **Parenting and Transitions**

Although some work has documented the caregiving behaviors of homeless parents (e.g., Hausman & Hammen, 1993; Torquati, 2002; Marra et al., 2009), we have yet to discover what happens when families obtain semi-permanent or permanent housing. Does the quality of parenting practices recover when families obtain housing? Or, do the effects of homelessness on parenting transcend the experience of homelessness? Finally, do varying personal and family-level circumstances predict change in parenting following homelessness? Literature does not yet describe how parenting changes or remains stable following homelessness, but research on other family transitions indicates supportive parenting takes time to recover after families experience significant structural change or disruption. For example, divorce research suggests that when confronted with family structure transition, parenting effectiveness fluctuates, tending to decrease initially, but rebounding over time (Hetherington, 1993; Wallerstein & Kelly, 1980). Many homeless families also experience structural changes (e.g., separation, custody arrangements); those who do not change structurally remain

vulnerable to many of the contextual transitions common in divorcing and repartnering families (i.e., frequent moves, school changes, decreased family income).

When studying parenting stress trajectories of low-income mothers, Chang and Fine (2007) used Bronfenbrenner's (1986) theoretical perspective to examine contributions of variables from increasingly distal systems. Adopting their approach, we begin by describing more proximal, individual-level predictors of growth (i.e., parent psychological resources: parenting self-efficacy, perceived interpersonal support), and then consider family and contextual influences (i.e., participation in a prevention program, residential instability). We examined all covariates as time-invariant predictors to increase application of results; for example, if baseline levels of parenting self-efficacy predicted positive growth in effective parenting, researchers may want to consider the cognitive aspects of parenting as an important dimension for prevention and intervention work.

### *Predictors of Formerly Homeless Mothers' Parenting Trajectories*

#### **Individual-Level Influences**

**Parenting Self-Efficacy.** Parenting self-efficacy describes a parent's belief that her parenting practices can promote change in her child's behavior (Teti & Gelfand, 1991; Bandura, 1982). When lacking the ontological security believed to accompany having a "home," parents' senses of security, mastery, and control are threatened (Shaw, 2004) – this may extend to the domain of parenting self-efficacy, particularly because mothers report having their senses of authority with their children challenged by other mothers and program staff (Choi & Snyder, 1999). Further, parenting self-efficacy may mediate the relationship between stressful circumstances and parenting practices. Earlier

studies have investigated the association between parenting efficacy and parenting practices using cross-sectional data. Studying an economically disadvantaged sample of inner-city families, Elder and colleagues (1995) examined the relationships between parenting self-efficacy, economic hardship, emotional distress, and parenting strategies. Parenting self-efficacy was a significant predictor of child management strategies, and economic hardship negatively impacted parenting self-efficacy. Parenting self-efficacy has also been recognized as a protective factor, mediating the relationship between psychosocial risk factors (e.g., maternal depression, sociodemographic status) and parenting competence (Teti & Gelfand, 1991).

Parenting self-efficacy also has an indirect effect on children's outcomes. Gewirtz and colleagues (2009), analyzing the baseline sample used in this study, reported that both parenting self-efficacy and observed parenting practices directly predicted children's adjustment – however, the effect of mothers' parenting self-efficacy on children's adjustment was fully mediated by observed parenting practices. Although findings support the concurrent relationship between parenting self-efficacy and effective parenting practices, we do not yet know if parenting self-efficacy predicts change in parenting over time. In this study, we extended the work of Gewirtz et al. to determine how parenting self-efficacy at baseline influences change in effective parenting.

**Interpersonal Support.** Findings highlighting the role of interpersonal support in predicting parenting practices indicate a complex, but important, relationship. Most recently, in a short-term longitudinal study of parents residing in emergency shelters, Marra et al. (2009) found conflict in social relationships to moderate the relationship between social support and parenting practices over time. Parents who perceived high

levels of instrumental and emotional support experienced greater improvements in parenting over time – but only when conflict in their relationships was low. When studying recently separated single mothers, Patterson and Forgatch (1990) reported deficits in mothers' social support networks after onset of separation, predicting increases in depressed mood and placing mothers at greater risk for coercive limit setting behaviors. To shed further light on the relationships between social support and parenting behaviors in transition, we included interpersonal support (including tangible resources, feelings of belonging, and perceived support) at baseline as a time-invariant predictor of initial status and change in effective parenting.

### **Contextual and Family-Level Predictors**

**Prevention Program Status.** In the present study, intent-to-treat (ITT) status best describes families' participation in a randomized control trial testing the effectiveness of the Early Risers "Skills for Success" prevention program in a supportive housing setting (August, Realmuto, Hektner, & Bloomquist, 2001). Early Risers, a school-based psychosocial program developed to minimize aggressive tendencies in at-risk school-aged children, has demonstrated efficacy and effectiveness in a variety of community settings. As implemented here, the multilevel prevention program also included Parenting Through Change as a family support component. Although Parenting Through Change (Forgatch and DeGarmo, 1999) has not previously been studied in a supportive housing context, it has demonstrated effectiveness in families experiencing structural transitions. For example, previous studies examining recently separated single mothers indicate improvements in supportive parenting practices following participation in the related Parent Management Training-Oregon Model program (PMTO; e.g.,

Patterson, DeGarmo, & Forgatch, 2004), although effects emerged later than expected (Forgatch & DeGarmo, 2002). Parenting Through Change was also shown to be feasible and appropriate when implemented with a homeless population in a pilot trial (Gewirtz & Taylor, 2009).

Few studies examining effectiveness of any parenting interventions in homeless families have been reported in the literature. One contributor to the limited understanding of how intervention can promote parenting in homeless families is high residential instability. Although targeted short-term interventions have been shown to decrease homeless parents' self-reported potential for abusive behaviors and parenting stress (Gorzka, 1999), high rates of mobility prior to post-test limit interventionists' abilities to follow up with homeless families even weeks following treatment. Residential instability not only jeopardizes the field's understanding of the potentially most stressed families, it also prevents a reliable interpretation of how interventions may influence parenting in homeless families. Because we do not yet know if participation in prevention programs predicts change in parenting, we examined this issue.

**Residential Instability.** Homeless mothers report higher frequencies of past moves than low-income housed mothers; in a case control study, Bassuk and colleagues (1996) noted that, on average, homeless mothers reported twice as many residential moves as low-income housed mothers. We could find no studies that directly examined the influence of residential instability on parenting, but the body of literature examining typologies of homeless families indicates complex relationships and diverse patterns among residential histories and family outcomes (e.g., Danseco & Holden, 1998; Rog, Holupka, & Patton, 2007) that may impact the parent-child relationship. A small number

of moves may be healthy for some families because they may indicate progress towards permanent housing in safer communities. For other families, even one reported move might indicate a decline in security. Although moves provide an index of instability regardless of their nature, researchers do not yet understand the complexity behind the influence of residential stability on influencing effective parenting practices. If number of moves predicts how parenting effectiveness changes over time, findings will suggest the value of a typology describing homeless families extends beyond political and social debate.

### *Research Questions*

Having obtained semi-permanent housing following a recent history of homelessness, many families in this study have reached a turning point in their lives. Research and theory suggest that supportive parenting can be compromised by homelessness, but also that recently homeless families exhibit a range of competency in parenting practices (Gewirtz et al., 2009). Little is known about the stability of or change in effective parenting practices following homelessness, and even less is known about the ability of individual and contextual factors predict intraindividual change. Latent growth curve modeling allows researchers to describe the level and shape of growth in a variable of interest. A multiple indicator approach to latent growth curve modeling (i.e., second-order latent growth curve modeling) extends the LGM model to include several observed indicators of a single latent construct, reducing measurement error and tapping into true growth. Therefore, using a second-order latent growth curve modeling approach to frame our work, we seek to answer the following research questions:

1. To what degree do observed parenting practices in recently homeless families change over a three-year period? Do mothers demonstrate individual differences in rate and shape of growth?
2. To what extent do certain individual and family-level predictors (i.e., interpersonal support, parenting self-efficacy, prevention program participation, residential instability) explain variability in initial level of effective parenting practices and change in parenting over time?

First, we expected to see positive linear growth in supportive parenting practices over time, demonstrated by a positive and statistically significant estimated mean of a linear latent growth factor. Second, we expected that the estimate of standard deviation of slopes (i.e., the square root of the slope factor variance) would be as large or larger than the mean slope factor, suggesting presence of interindividual differences in intraindividual change (i.e., random effects). When compared to the estimated means of slope parameters, a relatively large standard deviation would indicate that growth rates vary substantially among the sample.

Regarding the influence of the outlined predictors in distinguishing growth curves, although we expect all to contribute to improvement in model fit, we expected some to be more powerful predictors than others. First, for individual-level covariates, we thought psychological resources would contribute to higher levels of effective parenting at baseline (intercept) as well as increased change over time (slopes). Specifically, based on the contributions of Gewirtz et al. (2009), we expect parenting self-efficacy to significantly predict initial status in effective parenting and extended this expectation to growth in parenting. Regarding social support, we expected parents who

perceived their social networks to be strong and supportive to experience greater gains in parenting over time. At the family level, we expected participation in a prevention program (ITT status) to be positively related to growth in effective parenting. Finally, regarding residential instability, we predicted that number of moves in the year prior to baseline would relate to greater change in parenting (whether positive or negative), and may potentially predict a quadratic trend if the best-fitting model included a quadratic factor.

### Methods

Mothers and their school-aged children living in supportive housing agency sites were invited to participate in a research trial testing the effectiveness of the Early Risers program when delivered through a supportive housing context (August, Realmuto, Hektner, & Bloomquist, 2001; Gewirtz et al., 2007). The Healthy Families Network (HFN), a community-university partnership between 18 private, non-profit, family supportive housing agencies and University researchers, were the sites invited to participate in the study. Annually, the agencies serve a combined total of over 600 families (including 1,200 children) living in a Midwestern metropolitan area, providing families with permanent and semi-permanent housing at subsidized costs. To qualify for supportive housing, families were required to be homeless in the period prior to moving into the housing, with most sites additionally requiring a mental health, substance use, or HIV diagnosis of the parent, or exposure to domestic violence. Service provision differs across agencies based on populations served, but most frequently sites offer case management and referrals for both parents and children.

Of the 18 HFN sites invited to participate, 16 agreed to be randomly assigned to receive the prevention program or provide SAU. Within the sites, all families with a school-aged child (5 to 12 years old) were eligible for inclusion. Case managers asked eligible primary caregivers if they would be interested in participating in a research study aimed at promoting healthy child development. Upon recruitment, 253 children and their 152 mothers enrolled. Eighteen families (with 40 children) relocated or withdrew prior to baseline (T1) assessment. The remaining 134 families were assigned to ITT or SAU conditions based on housing site. An additional 8 families with 17 children were

recruited one year after baseline to increase the number of SAU group participants in the larger randomized control trial. T-test and chi-squared comparisons of these dyads with the original SAU cohort indicated no differences existed between the two cohorts; because differences were not found and no landmark occasions were observed to indicate varying cohort effects, these additional families were included with the original cohort in the dataset, resulting in a sample of 142 mothers with 229 children.

### *Participants*

The final sample included 229 parent-child dyads from 142 families. The majority of parents were single mothers (98.6%). Parents identified as African American ( $n = 49$ , 48.6%), white ( $n = 42$ ; 29.6%), multiracial ( $n = 13$ , 9.2%), Native American ( $n = 5$ ; 6.3%), and other ( $n = 6$ ; 4.2%). Three parents did not report ethnicity. At time of recruitment, parents ranged from 21 to 51 years of age ( $M$  age = 33.02,  $SD = 6.6$ ). On average, they had obtained 11 years of education (range 5 to 16 years;  $M$  education = 11.16,  $SD = 1.8$ ). Overall, the families experienced low socioeconomic status; average family income was \$10,601 ( $SD = \$6,286$ ). Child mean age at T1 was 8.08 years ( $SD = 2.31$ ); a little over half were female (51.1%). Children were African American (46.7%), white (20.1%), multiracial (19.7%), and other ethnicity (13.5%). Eighty-one children (35.4%) had open child protection cases; child protection status was unknown for 13 children. At T1, families reported moving 0 to 4 times in the last year ( $M$  moves = 1.35,  $SD = 1.2$ ). Additional baseline sample demographics are reported by Lee and colleagues (2008).

### *Procedure*

Enrollment, participation, and timing of program delivery are highlighted in Figure 1. As part of the larger research trial, families who enrolled in the study were assigned to receive the prevention program (ITT;  $n = 126$  children, 85 parents) or services as usual (SAU;  $n = 103$  children, 57 parents) condition based on random assignment by housing site. Both ITT and SAU families participated in annual assessment interviews held in their homes. Families were given the option to complete the assessments at the research lab if they preferred. The two-hour home assessment sessions, led by a team of trained research assistants, were held at baseline (T1) and three annual follow-ups (T2, T3, and T4). Families were offered childcare for their children who did not participate in the study and received a gift card to a general department store for their participation. During the sessions, children and their mothers completed standardized self-report surveys independently but participated in videotaped parent-child interaction tasks together afterward.

The Early Risers school-based prevention program, described further by Lee and colleagues (2008), began three months following baseline assessment. Children enrolled in the Early Risers program participated in a weekly after-school program led by family advocates and volunteer research assistants. The Early Risers program contains several components, including: socioemotional skill building through use of the Promoting Alternate Thinking Strategies curriculum (PATHS; Greenberg & Kusche, 1998), promotion of reading enjoyment through a Literature Appreciation curriculum, and referrals to appropriate resources from a family advocate. An additional family support component includes five 2-hr family nights aimed at providing parent education and promoting positive parent-child relationships. This adaptation of Early Risers also

offered a group parenting education component; parents in the ITT group were offered an opportunity to participate in the Parenting Through Change program (Forgatch, 1994), which began three months following T2 assessment.

### *Measures*

#### **Parenting Practices**

Trained research assistants observed and coded parenting practices using ratings of dyadic interaction during *Family Interaction Tasks* (FITs) described by Gewirtz et al. (2009). Originally designed to assess quality of parent-child interaction in low-to-middle class white families, the FITs presented here were modified for use with an ethnically diverse, low-income population (Gewirtz, DeGarmo, & Medhanie, 2011; Weinfeld et al., 1999). Tasks lasted approximately 26 min and included two 5-min problem-solving discussions and 16 min of structured games and teaching tasks. For the problem-solving discussions, research assistants asked parents and children to each select one “hot topic” from the Issues Checklist (Prinz, Foster, Kent, & O’Leary, 1979), a list of parent-child conflicts families tend to face on a regular basis. Issues were considered “hot” if they occurred frequently or were deemed as high intensity issues by the dyad. Interviewers instructed the pairs to spend 5 min discussing and solving each problem.

After the problem solving discussions, dyads participated in a guessing game, labyrinth/marble game, and tangrams puzzle (“tangoes”). Tasks provided opportunity for parents to demonstrate cooperation, scaffolding of new skills, and positive reinforcement. In the guessing game, mothers and children took turns providing clues about pictures on cards to help their partner guess the unknown objects. For example, if a mother held a card containing the image of a bicycle, she might say, “It has two wheels,” “You like to

ride it in the summer,” or “It has handlebars.” When it is the child’s turn to provide clues, the parent has opportunity to scaffold by asking questions (e.g., “What does it look like?”), providing directions (e.g., “Tell me what color it is”), or encouraging the child to continue (e.g., “It sounds like we’re getting closer. Let’s try again”).

The labyrinth game, played for 3 min, encouraged both cooperation and competition by requiring dyads to first work together to get several marbles through a wooden maze. First, the parent was asked to show the child how the knobs work. Next, dyads were instructed to work together to get the marbles into the holes on the board. After dyads cooperated for two short games, they competed. For three short games, each individual tried to be the first to move the marble to his/her desired location on the board.

Finally, the tangrams puzzle offered mothers opportunities to assist children in placing shaped pieces in the correct configuration to match a model shape provided on an accompanying card. During this task, parents reinforced children’s successes with praise and affection, broke the task into achievable steps, and encouraged children to work independently.

With the assistance of a coding manual, trained research assistants coded videotaped FITs using previously validated ratings of observed parenting practices in family interaction (e.g., DeGarmo, Patterson, & Forgatch, 2004). Coders rated positive involvement, problem solving, skill encouragement, and inept discipline. The extent of coder training varied by measurement occasion, but at minimum it included 10 hours of large group training and 20 hours of one-on-one training with a senior coder. After watching each interaction task twice, coders first provided independent ratings of parent and child behaviors, designating frequencies on 5-point Likert-type scales. Coders

determined the most appropriate choice for the items, choosing from: “Never applies (1),” “Hardly ever applies (2),” “Applies sometimes (3),” “Applies most of the time (4),” and “Applies all of the time (5)”. Then, for over half of the interactions, two coders (at least one of whom was a graduate research assistant) came to consensus through discussion. To measure coder reliability, intraclass correlation coefficients (ICCs; Shrout & Fleiss, 1979) were calculated from a random selection of tapes (24% at T1, 20% at T2, 10.7% at T3, and 9.2% at T4) rated by the majority of members of the coding team. Items comprising the observed indicators are listed in Appendix A.

*Inept discipline* was averaged from an 11-item scale rated on a 5-point scale ( $\alpha$  range: .81 - .87). Items referred to the frequency of mother’s behaviors throughout the entire interaction, including “mother was overly strict,” “authoritarian,” “inconsistent,” “oppressive,” “erratic,” “used nagging to get compliance,” and so on. Coder ICCs ranged from .62 to .69. We measured *problem solving* by averaging nine 5-point frequency items relating to the hot topics problem-solving discussions ( $\alpha$  range: .92 - .93). Items included: solution quality, brainstorming process, extent of resolution, plan of action and reward, likelihood to follow through, and apparent satisfaction with progress. Coder ICCs ranged from .75 to .79. *Positive parenting* was calculated by averaging skill encouragement and positive involvement scores. Skill encouragement comprised 11 items assessing parents’ abilities to: provide non-negative corrections as needed, positively reinforce the child’s attempts and correct responses, break the tasks into steps as appropriate, and encourage the child to work independently ( $\alpha$  range: .78 - .93). Coder ICCs ranged from .54 to .64. Positive involvement ( $\alpha$  range: .92 - .96) was calculated by averaging ratings from a 21-item scale assessing mothers’ warmth,

encouragement, affection, acceptance, and support across both problem solving and teaching tasks. Coder ICCs ranged from .68 to .88.

### **Individual-Level Influences**

**Parenting Self-Efficacy.** The Parental Locus of Control Scale (PLOC; Campis, Lyman, & Prentice-Dunn, 1986) assesses parents' perceptions of their parenting control and efficacy with their children. Mothers completed 47 items on a 5-point Likert scale (ranging from "strongly agree" to "strongly disagree") indicating the degree to which they believe they are able to influence their children's behavior and development. In this study, we used the domain-level parental efficacy subscale, consisting of 10 items referring to a parent's general sense of competence and perceived ability to influence her child's behavior (e.g., "my child usually gets his/her way, so why try," "what I do has little effect on my child's behavior"). Higher scores indicate lower self-perceived parenting efficacy. Campis and colleagues (1986) have reported strong internal consistency, as well as construct and discriminant validity, with parents of elementary school-aged children. In the validation study, a community sample reported average subscale scores of 17.62 and a help-seeking sample reported average scores of 19.27. For the study at hand, Cronbach's alpha was .70.

**Social Support.** Parents' social support was measured with the Interpersonal Support Evaluation List (ISEL; Cohen, Mermelstein, Kamarck, & Hoberman, 1985). The ISEL, which taps into perceptions of available interpersonal supports, contains 40 items (e.g., "If I needed some help in moving to a new house or apartment, I would have a hard time finding someone to help me") broken into four subscales: tangible support, self-esteem, appraisal, and belonging. Parents rated their agreement to statements on 4-point

Likert scales (including “definitely true,” “probably true,” “probably false,” and “definitely false”). Scores were averaged across subscales ( $\alpha = .941$ ). In other samples, the subscales possess high internal consistency, and the measure has demonstrated concurrent validity with other measures of support (Cohen & Hoberman, 1983). Higher scores indicate greater perceived social support.

### **Family-Level and Contextual Influences**

**Prevention Program Status.** Families were randomized to an ITT or SAU condition by site at recruitment, before baseline assessment. Regardless of degree of participation, families enrolled in the prevention program were dummy coded as “1”; families receiving services as usual were coded as “0”.

**Residential Instability.** At T1, mothers reported the number of times their families had moved in the prior year by responding to a single item on a demographic questionnaire: “how many times have you moved in the year prior to this study?” Mothers responded to a similar item at T4: “how many times have you moved in the course of the study?”

### **Auxiliary Variables**

**Child and Parent Age.** At T1, parents reported dates of birth for each family member participating in the study.

**Parent Ethnicity.** At T1, parents self-reported racial identity from the following categories: African American, white, multiracial, Native American, and other.

**Family Income.** Parents reported weekly or monthly incomes to research staff. Figures were multiplied by 52 or 12 to create an annual income variable.

### **Clustering Variable**

**Family Membership.** Research staff assigned 5-digit identification numbers to each parent and 6-digit identification numbers to each child. Using this information, we created a clustering variable to identify family-level nestedness in the data set. Family membership was included in the model using the COMPLEX specification (described in more detail below).

### *Analytic Plan*

#### **Latent Growth Curve Analyses**

Latent growth curve modeling (LGM) is an extension of structural equation modeling (SEM) that allows researchers to examine intra-individual change over time and consider the variance explained by covariates (Duncan & Duncan, 1995; Willett & Sayer, 1994). Like its parent framework, SEM, LGM provides flexibility in handling of missing data and in extensions of modeling. In traditional first-order LGM, latent factors (e.g., intercept, slope) represent change in an observed indicator over time. This is an appropriate model when the repeated measure outcome of interest is best represented as a single indicator (Hancock, Kuo, & Lawrence, 2001). When the outcome of interest, however, is a psychological latent construct indexed by multiple indicators, the model requires expansion to accommodate the additional hierarchical level.

As noted earlier, LGM is considered a flexible modeling strategy (Preacher et al., 2008) because models can be extended to capture increasingly complex relationships among factors and variables. For example, when a repeated measure is better represented as a latent construct than an emergent construct (Hancock, Kuo, & Lawrence, 2001), investigators can extend the LGM to become a second-order latent growth curve model (2LGM), where chronometric latent factors are included to represent change over time

(i.e., slope, intercept) and psychometric (i.e., trait) latent factors are included to represent the underlying construct of interest (McArdle, 1988). In this situation, latent growth factors are chronometric second-order factors and represent underlying change in an underlying first-order factor (see Figure 2 for depiction of a 2LGM with a linear slope). Describing the advantages of a 2LGM approach when measurement invariance holds, Widaman and colleagues (2010) state, “growth processes represented by the Level and Slope latent variables reflect quantitative growth in a latent construct that retain its qualitative nature, and thus a constant interpretation, over time”. Further, with innovative approaches to scaling identification (e.g., effects coding; Little, Slegers, & Card, 2006) researchers can interpret change in factor structures on a meaningful scale. In this study, each first-order factor was comprised of three indicators: problem solving skills, effective discipline, and positive parenting.

Second-order latent growth modeling is appropriate for the proposed study for several reasons. First, the repeated measure construct of interest, effective parenting, has been established previously as a latent factor containing multiple indicators using cross-sectional data (see Gewirtz et al., 2009). Second, we aimed to model growth in the effective parenting construct void of measurement error. If supportive parenting were included as a composite variable rather than a latent factor (and a first-order LGM was specified), the model would include measurement error created from summing or averaging scales from the coding protocol; therefore, we could not make inferences about the theoretical construct without acknowledging the potential inclusion of measurement error. We obtained more precise estimates of change (and increased statistical power) because regression coefficients representing relationships among growth parameters were

disattenuated from error (Ferrer, Balluerka, & Widaman, 2008; Muthén & Muthén, 2010a).

Finally, consideration of effective parenting as a first-order longitudinal factor in a 2LGM required testing of measurement invariance, which allows examination of the longitudinal reliability and validity of the Coder Impressions tool as comprising an underlying latent construct. Prior to this study, no published work has examined the factorial invariance of the parenting construct. Due to the use of the Coder Impressions protocol across several studies, examination of its longitudinal psychometric properties benefits users and developers of the scales. In the next subsections, we describe the steps we took to analyze the data using a 2LGM approach: 1) testing longitudinal factorial invariance and establishing a measurement model, 2) determining the nature of individual growth (e.g., level, shape), and 3) estimating direct effects of predictors on the growth factors to determine if hypothesized covariates explain variance in initial level or change in effective parenting (Kline, 1998).

**Longitudinal Confirmatory Factor Analysis.** Second-order latent growth curve models are unique from single-order factor models because they allow researchers to include multiple indicators at each measurement occasion. In exchange for the advantage of including psychometric factors in the growth model, 2LGM requires researchers to test factorial invariance of the construct of interest in a longitudinal confirmatory factor analysis. Factorial invariance, or measurement equivalence, refers to the stability of a construct's composition over time (or across groups) and provides empirical evidence that the same underlying construct is being assessed across repeated measurement occasions (Little, 2012). Longitudinal factorial invariance is upheld when the multiple

observed indicators comprising a construct maintain their relationship to the construct (and each other) across repeated measurements.

In single-order LGMs, researchers cannot test the assumption that single indicators are invariant over time (Ferrer et al., 2008); instead, as with traditional inferential statistical tests (e.g., repeated measures t-tests), they must assume factorial invariance. Researchers specifying 2LGMs can use nested model comparisons, evaluating one criterion at a time in a stepwise progression, to determine the level of factorial invariance that best describes a model (e.g., Little, Preacher, Selig, & Card, 2007; Widaman & Reise, 1997). Establishment of factorial invariance can be a complex process, however. Methodologists are still learning how to remedy or better understand situations when longitudinal factors are variant or only partially invariant (meaning at least one indicator variance or intercept remains invariant across occasions). On the other hand, finding factorial invariance tenable suggests that growth parameter estimates result from true growth in the underlying construct rather than a change in the factor's metric (Widaman & Reise).

Factorial invariance is established both qualitatively and quantitatively. *Configural invariance*, a qualitative assessment of invariance (Little, 2012), involves assessing the structure of the longitudinal confirmatory factor analysis (CFA) and ensuring the same expected patterns hold across time points in a model where all parameters are allowed to vary freely. Figure 3 provides a visual depiction of the configurally invariant CFA model. For example, when considering parenting, do we expect the same number of observed indicators to comprise the underlying factor at each time point? Are we constraining and estimating the same parameters across time points?

This initial model serves as a baseline model for nested model comparisons. By imposing higher levels of invariance (i.e., constraints) and examining change in fit statistics (e.g., Bayesian information Criterion; Schwarz, 1978), researchers are able to determine if invariance levels are tenable (Widaman & Reise, 1997; Cheung & Rensvold, 2002).

Quantitative testing of factorial invariance occurs at three levels and is evaluated through nested model comparisons. *Weak factorial invariance*, or metric invariance, implies factor loadings of indicators remain approximately invariant over time, suggesting that indicators' relationships with the underlying construct do not change over time (Hancock et al., 2001). For example, if effective parenting loaded onto problem solving skills at  $\lambda = .800$  at T1, we would hope that the approximate strength of this factor loading remained similar at later time points. Relative patterns among the unique factor loadings should remain constant as well. Researchers test factorial invariance by adding one constraint at a time and evaluating change in fit indices. In the weak invariance model, factor loadings are constrained to be equal.

Building upon these criteria, at the second level of invariance, *strong factorial invariance* (i.e., intercept invariance), the measurement intercept also remains constant across time points. Finally, under conditions of *strict factorial invariance*, factor loadings, intercepts, and unique variances of indicators remain constant over time. Methodologists are still investigating the benefits and consequences of achieving strict factorial invariance; currently, some developmental methodologists (e.g., Sayer & Cumsille, 2001; Little, 2012) advise against strict factorial invariance because its

limitations on heterogeneity in variance may limit the very essence of change that we desire to understand.

In the study at hand, we built the measurement model and tested the tenability of factorial invariance over time by adding constraints to a fully unconditional null model in a stepwise manner. We examined the series of models presented in Table 1; participants who did not provide observational data at any measurement occasion were excluded from testing of factorial invariance. First, we specified a null longitudinal confirmatory factor model by restricting indicators' variances and intercepts to equality (Little, 2012). The null model was provided as a benchmark for further analyses. Each time a constraint was added to the model, the constrained model fit was compared to the fit of the previous, less constrained model in a stepwise manner.

For this first stage of analyses, we conducted nested model comparisons by examining differences in the Bayesian Information Criterion (BIC; Schwarz, 1978; Konishi & Kitagawa, 2008). The BIC is an adjusted likelihood ratio fit statistic that allows for both nested and non-nested model comparisons. It favors model parsimony over complexity and takes sample size into account in its calculation:

$$\text{BIC} = -2 + \ln(L) + k \ln(n)$$

(i)

where  $n$  indicates sample size,  $k$  indicates the number of estimated free parameters, and  $L$  indicates the maximized value of the likelihood function for the estimated model (Konishi & Kitagawa; Azen & Budescu, 2009). We considered a constraint appropriate (and invariance tenable) when the BIC of the model being tested was lower than that of the previous step, letting the  $\Delta\text{BIC}$  determine the best-fitting model. For example, strong

factorial invariance would be met if the BIC were lower than the BIC for weak invariance. Although the BIC provided the primary decision rule for model comparison, we also required the selected measurement model (i.e., best fitting model) to result in acceptable values of the absolute fit indices (e.g., root mean squared error approximation; RMSEA; Steiger, 1990) and relative fit indices (e.g., comparative fit index; CFI; Bentler, 1990).

**Model of Change: Unconditional Models.** Once we arrived at an appropriately specified measurement model and described measurement invariance, we examined the level and shape of change for the full sample using a 2LGM approach. The models of change were framed as unconditional models because covariates were not included in model specification (Kline, 2008); therefore, the interpretation of the intercept parameters was not conditional on the presence of covariates. In a staged manner, we compared the models described in Table 2, beginning with an unrestricted model and placing constraints in a stepwise fashion to determine the nature of change represented by the data. The estimated mean factor score, indicating the group aggregate mean at each measurement occasion, would follow the following formula:

$$M_{\text{parenting at Time } t} = M_I + M_L(\text{Time } t) + M_Q(\text{Time } t^2) \quad (\text{ii})$$

where the mean of the intercept (i.e, initial status) factor is represented by  $M_I$ , the mean of the linear slope factor is represented by  $M_L$ , and the mean of the quadratic factor (if supported) is represented by  $M_Q$ . Regarding random effects and individual variability, whenever a random effect for a latent factor was included in the model (i.e., variance was

estimated around the latent factor), latent factors were allowed to covary so we could determine if initial status influenced development in effective parenting over time (Hancock et al., 2001).

From this step forward, we controlled for shared family variance among children by using the COMPLEX specification in MPlus 6.11. Almost half of the parents in our study ( $n = 64$ ) contributed multiple parenting scores because they had multiple children participating in the study (i.e., siblings), and therefore participated in dyadic observational tasks multiple times. Although parenting is generally considered an aspect of the nonshared environment (Rutter, 2000), sibling data are considered dependent because they are “within family” observations; certain attributes are shared or related among family members in a non-random pattern. Even when genetically unrelated, parent-child dyads within a family are more likely to be rated similarly than between-family dyads (Fitzmaurice, Laird, & Ware, 2004), resulting in clustering of data. The COMPLEX specification increases standard errors and minimizes the likelihood of inflated effects due to correlated within-family observations through use of a sandwich estimator and robust maximum likelihood estimation (Muthén & Muthén, 2010)<sup>1</sup>.

Model comparison was conducted using three fit statistics. Although several fit indices are available to researchers for model selection and comparison, a decision rule should be made *a priori* as to which criteria will determine fit. Similar to the process we adopted with measurement invariance, we used the BIC to be the primary decision maker for model comparisons. We also chose to examine both absolute and relative fit indices

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<sup>1</sup> In this study, total sample size ( $n = 229$ ) represents the 229 parenting scores of 142 mothers. Throughout the paper, the word “parents” may be used interchangeably with “parenting score” or “dyad”; however, we recognize that 142 individual parents contributed between 1 and 4 scores.

as we compared models, selecting the RMSEA (Steiger, 1990), the CFI (Bentler, 1990), and the Satorra-Bentler  $\chi^2$  difference test (Satorra & Bentler, 1994). The RMSEA, recommended by Preacher et al. (2008), is a measure of absolute fit that compares the model to a saturated, good fitting model by considering the amount of misfit per change in degrees of freedom. Generally, an RMSEA  $< .05$  indicates good model fit, and a value  $< .08$  suggests acceptable fit. The CFI is a measure of relative fit, which allows the researcher to compare the hypothesized model to a null model. A CFI falling above  $.90$  indicates adequate model fit and  $.95$  indicates good fit.

Finally, because we adjusted for correlated error due to non-independence of observations, we used a maximum likelihood with robust standard errors (MLR) estimator for analyses. Therefore, although the BIC is appropriate for model comparison with any maximum likelihood estimator, we conducted the Satorra-Bentler  $\chi^2$  difference test to support the BIC in conducting nested model comparisons. The Satorra-Bentler  $\chi^2$  difference test offers an opportunity to conduct nested model comparisons under MLR by computationally adjusting the maximum likelihood  $\chi^2$  test statistic with a scaling correction factor and calculating the  $T_s$  statistic (Geldhof, Selig, & McConnell, 2008). The  $T_s$  statistic can then be compared to a normal  $\chi^2$  distribution to determine statistical significance; for example, statistical significance is met when  $\chi^2 > 3.84$  and difference in degrees of freedom equals one. In addition to fit statistics, we also used ocular examination to support model fit, checking the results to ensure they approximated our general assumptions and reasoning.

**Prediction of Change: Conditional Models.** After determining the appropriate form of growth for effective parenting, we specified conditional models of change to

explore the contributions of individual, family, and contextual factors in the change process. As stated earlier, all covariates were included in the models as time-invariant covariates, meaning that they were tested as having indirect effects on effective parenting through their influence on the latent growth factors. Structurally, time-invariant covariates were modeled as:

$$\omega_t = \alpha + \rho_{\omega} \omega_t + \delta_{\omega t} \quad [\text{iii}]$$

$$\beta_t = \beta + \gamma_{\beta} \omega_t + \delta_{\beta t} \quad [\text{iii}]$$

where  $\omega$  is the time-invariant covariate,  $\alpha$  and  $\beta$  are average intercepts in the regression on  $\omega$ ,  $\gamma$  are the regression slope parameters, and  $\delta$  represent residuals. At this step, the growth factors move from exogenous to endogenous variables in the model (Kline, 2008). With the exception of ITT status, the intercept, linear trend, and quadratic curve factors were regressed on all covariates (see Figure 4). Only the linear and quadratic factors, but not the intercept, were regressed on ITT status because we expected prevention program participation to influence the change process, but not predict differences in initial status.

Covariates were considered as significant contributors to the change process based on the  $p$ -values associated with their relationship with the latent growth factors. Values below  $<.05$  were deemed statistically significant. If parameters were not statistically significant, they remained in the growth model. Because this is one of few studies examining change and prediction of change in effective parenting of formerly homeless families, no hypothesized parameters were trimmed from the model to

encourage replication from future studies and to contribute to the recursive process of theorizing.

Therefore, to examine our research questions, the analysis was divided into four steps: 1) conducting missing data analyses; 2) building a measurement model to examine factorial invariance; 3) specifying a 2LGM to determine the shape and rate of change; and 4) examine contributions of hypothesized predictor variables in predicting initial levels and change in effective parenting.

## Results

### Preliminary Analyses

Before establishing the measurement model and evaluating missing data, we conducted exploratory analyses of study variables. Across measurement occasions, observed indicators (which comprised the latent effective parenting factor) were approximately normally distributed, demonstrated by skewness and kurtosis values falling within appropriate ranges. Residuals met assumptions of approximate normal distribution and homoscedasticity. Preliminary exploration of T1 data indicated that, on average, parents displayed moderate levels of positive parenting (approaching “sometimes”;  $M = 2.81$ ,  $SD = .36$ ), moderate levels of effective discipline (between “sometimes” and “most of the time”;  $M = 3.49$ ,  $SD = .751$ ), and lower levels of problem solving skills (“hardly ever applies”;  $M = 1.83$ ,  $SD = .800$ ). Descriptive statistics of observed effective parenting indicators and mean factor scores are provided in Table 3.

Table 4 contains the means and standard deviations of remaining study variables at baseline. Parents reported between 0 and 4 residential moves ( $M = 1.35$ ,  $SD = 1.20$ ) in the year before baseline. Parenting self-efficacy ( $M = 17.31$ ,  $SD = 5.48$ ). Parents reported an average score of 2.16 ( $SD = .485$ ) on interpersonal support. According to the results of *t*-tests, families who participated in the prevention program did not differ from SAU families on any study variables at baseline (all *p* values > .05).

### Measurement Model

We tested factorial invariance by examining the series of models presented in Table 1. Results of the null longitudinal confirmatory factor model, with indicators’

variances and intercepts constrained to equality, are presented in Table 5. The null model was provided as a benchmark for further analyses.

After specifying the null model, we moved forward, testing models with increasing invariance constraints (Widaman et al., 2010). For the configurally invariant model (CFA<sub>2</sub>), we used the effects coding method of identification (i.e., constraining item specific factor loadings at each time point to average three and indicators' intercepts to average 0; Little, 2012) to set the scale for the latent construct. As typical for longitudinal SEM, residuals among unique indicators were allowed to correlate across time points (e.g., problem-solving at T1 was allowed to correlate with problem-solving at T2, T3, T4; e.g., Widaman, Ferrer, & Conger, 2010). Because the configurally invariant model is the least restrictive model for evaluating invariance, all other parameters were estimated freely. The CFA<sub>2</sub> model fit the data well ( $\chi^2 = 25.668$ ,  $p = .692$ , CFI = 1.00, RMSEA < .001) and patterns emerged as expected (see Table 6). For example, all factor loadings were positive and of similar strength. Also, latent factors with less chronological distance in measurement occasion from one another were more highly correlated (e.g., T1 and T2 were correlated more strongly than T1 and T3). Because the model appeared to fit the data well and no modifications were necessary, this model was used as the baseline model for evaluating factorial invariance by conducting nested model comparisons (Little, 2012).

Next, we constrained specific item factor loadings across time points to test for weak factorial invariance (i.e., "factor loading invariance"; Widaman & Reise, 1997), again allowing correlated residuals. The model fit the data well ( $\chi^2 = 32.651$ ,  $p = .629$ , CFI = 1.00, RMSEA < .001). The change in the CFI was less than .01 and the confidence

intervals of the RMSEA values for the configural and weak models overlapped, indicating weak invariance was tenable (Cheung & Rensvold, 2002) and we could proceed to examine strong factorial invariance.

To test for strong factorial invariance (i.e., “intercept invariance”), we constrained indicator intercepts in addition to the factor loadings. Examination of fit indices indicated strong factorial invariance was tenable for the data. The model demonstrated poorer absolute fit in comparison to the weak model ( $\chi^2 = 32.651, p = .629, CFI = 1.00, RMSEA = .054$ ), however, the BIC favored the strong invariant model, indicating the intercept constraint improved the model’s efficiency.

### **Missing Data Analyses**

Before specifying the 2LGM, we conducted missing data analyses for data at the item, participant, and family levels. Estimation of missing data values limits bias otherwise introduced by alternative approaches (Jelicic, Phelps, & Lerner, 2009; Peugh & Enders, 2004), but estimation is deemed appropriate by the nature of the missing data. Data considered to be missing at random (MAR) or missing completely at random (MCAR) are eligible for estimation, but data missing due to unobserved reasons (missing not at random; NMAR) may be less appropriate for estimation with modern missing data methods (Little & Rubin, 1987). Therefore, we aimed to describe the nature of missingness of data at each level of participation to determine eligibility for estimation.

Family-level and dyad-level missing data occurred at a higher rate than item-level data and required detailed investigation. First, no missingness was observed on several variables, including the clustering variable (parent ID number), prevention program participation status, or number of moves reported in the year before baseline. Second, at

the dyad-level, we conducted one-way analyses of variance (ANOVA) to compare dyads that participated in baseline assessment ( $n = 229$ ; 84.8%) to those who dropped out before assessment began ( $n = 41$ ; 15.2%). To adjust for potentially inflated Type I error stemming from multiple testing, we used a cutoff  $p$ -value of .01 for all ANOVAs. We observed no significant differences on any demographic variables between those who participated and those who dropped out prior to in-home interviews. Dropouts were removed from all further analyses.

Next, of those who participated in the study (i.e., non-dropouts;  $n = 229$ ), we examined patterns of missingness based on the level dyads participated in observational assessments. Because some methodologists are reluctant to impute outcome data when participant is missing outcome data at all measurement occasions, we explored the extent to which participants provided data across time points to compare dyads based on their levels of participation. We computed a count variable indicating the number of times a participant provided observational data (ranging from 0 to 4). Over half of participants ( $n = 144$ ; 62.9%) provided data on at least one measurement occasion (see Table 7). We conducted one-way ANOVAs, first collapsing the count variable into a dichotomous variable (0 = “did not provide”, 1 = “did provide”) to compare participants providing and not providing observational data. Dyads did not vary significantly on any study variables (e.g., number of moves, interpersonal support, family income).

Next, we revisited the count variable and compared dyads that provided observational data at least once ( $n = 144$ ) based on number of measurement occasions. Participants demonstrated a non-monotonic pattern of missingness, meaning that non-participation at one measurement did not necessarily indicate dropout or lack of

participation at a future occasion. We sought to determine if dyads that left the study or missed a single measurement occasion differed from those who participated on more occasions. We conducted one-way ANOVAs, using assessment participation level as a fixed factor and study variables as dependent variables. No significant differences emerged among the four groups.

Finally, we examined the missingness of item-level data for the repeated measures outcome indicators. Because trained coders were instructed to rate every item as they completed the observational protocol, item non-response was limited (<.5%) at the dyad level on the scales comprising the effective parenting factor. In conjunction with this exploration of missingness, we had no other reason to believe likelihood of missing data would be related to families' scores on parenting indicators (Peugh & Enders, 2004). Therefore, we considered data to be MAR and missing data met criteria for maximum likelihood estimation, a favorable solution to traditional missing data methods (e.g., listwise deletion, mean substitution) because of its ability to produce unbiased (or less biased) parameter estimates (Schafer & Graham, 2002; Peugh & Enders, 2004)<sup>2</sup>.

Using MPlus 6.11 (Muthén & Muthén, 2010), we estimated missing values using full-information maximum likelihood (FIML) estimation under the assumption that data were MAR. We built upon Mplus' default saturated correlated approach by including auxiliary variables in our model. Auxiliary variables are variables that may or may not be correlated with reasons for missingness and not considered study variables, but "help" with missing data estimation by providing the model more data to estimate from

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<sup>2</sup> In addition to missing data analyses, we also ran all primary data analyses twice to ensure our estimation strategies did not bias the results. In each step, the models for both estimated ( $n = 229$ ) and partially estimated data ( $n = 144$ ) fit the data equally well. Therefore, we retained the sample of 229 dyads for results reporting.

(Graham, 2003). By providing more observations and decreasing fractions of missing data, auxiliary variables improve statistical power of the missing data model, particularly when auxiliary variables are correlated with the missing variable (Graham). Auxiliary variables also assist in supporting the claim that data are MAR (Collins, Schafer, & Cam, 2001). In our missing data model, we included child age, parent age, number of moves in the year before baseline, family income, race, prevention program status as auxiliary variables. Study variables were estimated through FIML.

### **Second-Order Latent Growth Modeling**

**Model of Change: Unconditional Models.** Testing the models described in Table 2, we conducted model comparison by comparing values of the BIC and using  $SB\chi^2$  difference tests to test hypotheses and determine which change model provided the best fit for the data. Results of model comparisons are provided in Table 8. In the first step, we specified an unconstrained model, 2LGM<sub>1</sub>, which freely estimated coefficients of the latent slope factor (i.e., non-linear; Meredith & Tisak, 1990). Examination of the latent slope parameter estimates suggested that effective parenting seemed to be demonstrating a slight arch shape, with increases occurring between T1 and T3, but a decrease occurring between T3 and T4. This unconstrained baseline model fit the data well (BIC = 8626.73; CFI = .951; RMSEA = .055).

We moved forward, adding a random linear slope factor to the model (2LGM<sub>2</sub>). Although the parameters of the linear slope factor (i.e., mean, variance) were both significantly different from 0, results indicated when compared to the unconstrained model, the linear slope factor model did not provide an appropriate fit to the data: BIC = 8634.05;  $\Delta SB\chi^2(2) = 11.34, p < .01$ ; CFI = .929; RMSEA = .065.

Because the linear constraint did not adequately capture the growth process in effective parenting, we compared 2LGM<sub>2</sub> (the random intercepts and random linear slopes model) to 2LGM<sub>3</sub>, a random intercepts, random linear trend, and fixed quadratic factor model. Results indicated significant improvements in model fit: BIC = 8624.12;  $\Delta\text{SB}\chi^2(1) = 22.30, p < .01$ ; CFI = .953; RMSEA = .054.

For the final model comparison, we built upon 2LGM<sub>3</sub> by freely estimating random effects for the quadratic growth factor as well. Intercept, linear trend, and quadratic curve factors were allowed to vary and covary with one another. Although the model provided appropriate fit to the data overall, because none of the random components ( $\psi_{33}$ ,  $\psi_{31}$ , and  $\psi_{32}$ ) differed significantly from 0 and the  $\Delta\text{BIC}$  favored the previous model, we determined the minimal gain in model fit was not worth the added complexity: BIC = 8633.02;  $\Delta\text{SB}\chi^2(3) = 8.99, p = .05$ ; CFI = .961; RMSEA = .05. Therefore, the 2LGM<sub>3</sub> fixed quadratic factor model was retained as the most desirable unconditional model of change. Unstandardized parameter estimates are provided in Table 9.

Substituting estimates for coefficients, we obtained the following factor means at each measurement occasion:

$$\text{T1: } M_{\text{effective parenting}} \text{ at } \text{Time } t=0 = M_I + M_L(0) + M_Q(0) = 2.725 + 0 + 0 = 2.725 \quad (\text{iv})$$

$$\text{T2: } M_{\text{effective parenting}} \text{ at } \text{Time } t=1 = M_I + M_L(1) + M_Q(1) = 2.725 + .305 + -.075 = 2.956 \quad (\text{iv})$$

$$\text{T3: } M_{\text{effective parenting}} \text{ at } \text{Time } t=2 = M_I + M_L(2) + M_Q(4) = 2.725 + .610 + -.300 = 3.035 \quad (\text{iv})$$

$$\text{T4: } M_{\text{effective parenting}} \text{ at } \text{Time } t=3 = M_I + M_L(3) + M_Q(9) = 2.725 + .915 + -.675 = 2.965 \quad (\text{iv})$$

Figures 4 and 5 provide a visual depiction of the unconditional growth model.

The average growth curve resembled an upside down, shallow bowl shape, with effective

parenting increasing between for the first two years of the study and decreasing slightly over the last year. A negative covariance between the intercept and linear trend factors was discovered ( $\psi_{21} = -.0315; p < .01$ ), indicating that parents who demonstrated lower levels of effective parenting at T0 experienced greater rates of change over time.

**Conditional Growth Models.** To examine the influence of covariates on the growth factors, we used our quadratic fixed factor model as a foundation and specified a conditional growth model by regressing the intercept, linear trend, and quadratic growth factors on the covariates (ITT status, parenting self-efficacy, residential instability, and social support). Fit statistics indicated the overall model fit was acceptable (BIC = 10172.16;  $\chi^2_{(85, n=229)} = 125.851$ , RMSEA = .045<sub>(.027; .061)</sub>; CFI = .931), although the more parsimonious, unconditional model (without covariates) had better fit due to the large difference in degrees of freedom (see Table 10). Examination of variance components of the intercept and linear trend factors suggested the predictors accounted for some variability because there was a slight decline in the unconditional variance relative to the conditional variance (i.e., disturbance variance) for both the intercept and linear factors (see Figure 7).

Parameter estimates (standardized and unstandardized) are provided in Table 11. Model parameters shifted substantially with the transition from an unconditional to conditional model (note the direction of slope and quadratic factors). The covariance between intercept and linear slope uncovered in the unconditional model remained significant; the rate at which parenting changed was negatively related to initial status of effective parenting ( $\psi_{21} = -.031$ ). Parenting self-efficacy was the only empirically supported predictor in the model; at T1, higher degrees of parenting self-efficacy related

to higher initial levels of parenting effectiveness ( $r = -.40$ ;  $p = .001$ ). Parenting self-efficacy also significantly predicted growth in parenting over time ( $r = .754$ ;  $p = .001$ ). Residential instability, prevention program participation status, and interpersonal support did not contribute significantly to the model (all  $p < .05$ ), but were retained in the final model for theoretical reasons.

To better understand the magnitude and direction of the effect of parenting self-efficacy on initial status and growth, we plotted trajectories for varying levels of parenting self-efficacy. For ease of interpretation, we reran the model, excluding the other hypothesized predictors that did not gain empirical support. To arrive at the plots of estimated factor scores, we first used the equations:

$$M_I = \alpha_I + \beta_{EI}M_E = 3.324 + (-.034 \times 17.3) = 3.324 - .588 = 2.73 \quad (v)$$

$$M_L = \alpha_L + \beta_{EL}M_E = -.114 + (.024 \times 17.3) = -.114 + .415 = .301 \quad (v)$$

$$M_Q = \alpha_Q + \beta_{EQ}M_E = .025 + (-.006 \times 17.3) = .025 - .1038 = -.078 \quad (v)$$

to estimate the factor means, where  $M_I$ ,  $M_L$ , and  $M_Q$  represent estimated intercept, linear, and quadratic means;  $\beta_{EI}$ ,  $\beta_{EL}$ , and  $\beta_{EQ}$  represented the estimated regression coefficients of intercept, linear trend, and quadratic curve factors on parenting efficacy; and  $M_E$  represented the sample mean for parenting self-efficacy. To create the plots, we substituted the sample mean of parenting self-efficacy with values two standard deviations above and below the sample mean (see Figure 8), and then entered the appropriate coefficients into the formula. Here, we present the formula when the sample mean of efficacy was used ( $M = 17.3$ ).

$$M_{\text{self parent}} \text{ at time } t = M_I + M_L(\text{Time } t) + M_Q(\text{Time } t^2) \quad (\text{vi})$$

$$M_{\text{self parent}} \text{ at time } t=0 = 2.73 + 0 + 0 = 2.73 \quad (\text{vi})$$

$$M_{\text{self parent}} \text{ at time } t=1 = 2.73 + .301 - .078 = 2.95 \quad (\text{vi})$$

$$M_{\text{self parent}} \text{ at time } t=2 = 2.73 + .301(2) - .078(4) = 3.02 \quad (\text{vi})$$

$$M_{\text{self parent}} \text{ at time } t=3 = 2.73 + .301(3) - .078(9) = 2.93 \quad (\text{vi})$$

Comparison between the conditional factor score means and the unconditional means (presented above as well as in Figures 5 and 7) indicate the same quadratic shape held for the two models, despite directions of the parameter estimates changing with the model specification including covariates. Further, ocular examination of the plot lines for higher and lower values of parenting self-efficacy supported the suggestion that the predictor had a large effect on explaining variance in initial status and growth. Parents demonstrating higher levels of parenting self-efficacy experienced less pronounced growth over time when compared to parents reporting lower levels of self-efficacy, but maintained higher absolute levels of effective parenting.

To examine the size of the effect in more detail, we reviewed  $R^2$  estimates for the second-order latent factors. The conditional model explained 17.5% of the variance in initial status of the effective parenting factor, indicating a substantial amount of variance remained to be explained by other unobserved variables. When considering slope, the covariates explained 58.6% of the variance in linear growth over time, resulting in a very large effect size. Estimates for the quadratic factor were not provided because the variance was constrained to be 0.

## **Discussion**

The aim of this study was to build upon the field's understanding of parent-child interaction in homeless families by describing how effective parenting changes following homelessness. Although previous studies have suggested parenting quality may be compromised while families are homeless, findings presented here suggest parenting possesses potential to recover when families obtain stable housing. The findings presented contribute to the literature on parenting in formerly homeless families in several important ways. First, the effective parenting practices of formerly homeless families were analyzed and described. Second, we highlighted the usefulness of individual and contextual factors in the lives of these families associated with change in parenting. Finally, the study provides preliminary evidence of the longitudinal validity of the Coder Impressions observational ratings protocol in high-risk families. In the sections to follow, we examine each contribution in detail, providing insight into supported hypotheses and consideration of potential alternative explanations. Then, we discuss implications for intervention and research, and suggest avenues for improvement for future studies. Finally, the study's overall contributions are highlighted in the landscape of broader theoretical perspectives and the current stage of the research on parent-child interactions following homelessness.

### **Improvements in Parenting**

The primary research question addressed by this study inquired about the presence of change or stability in effective parenting practices for families with a recent history of homelessness. Our initial goal was to describe the longitudinal nature of parenting in formerly homeless families, including only time as a predictor. Results from

the model of change suggested that at baseline, parents exhibited moderate levels of effective parenting in interactions with their children. A positive mean value of the linear trend factor and a negative mean value of the quadratic trend factor indicated initial aggregate growth in effective parenting, with a slowing of growth as time passed. Examination of estimated plots and sample statistics illustrate the tapering off (or slight decreases) occurred primarily between T3 and T4. The bulk of gains in effective parenting occurred between T1 and T2.

**Recovery.** Gains in effective parenting following homelessness can be explained from several perspectives, including one of disruption and recovery, and one of improvement. Consistent with Patterson and Forgatch's (1990) theoretical and empirical work regarding disruptions in parenting, and additional empirical research on recently separated single mothers (e.g., Hetherington, 1993), it is possible parenting was exhibiting a recovery following the disruptions associated with homelessness. As noted earlier, parenting and patterns of microsocial parent-child interactions can be disrupted when families are experiencing severely stressful circumstances and risk accumulates (e.g., Webster-Stratton, 1990; Bank, Forgatch, Patterson, & Fetrow, 1993). Gewirtz et al. (2009) described how parents' distress can have a "spillover" effect on the parent-child relationship. Although we do not have data describing parenting in this sample prior to homelessness or provision of supportive housing, it is possible parents were regaining their capacity to parent effectively because of improved conditions in their environments (and potentially decreased stress) – and less "spillover" was occurring. As the duration of time between homeless and housed status increased, families were able to reestablish more frequent, consistently supportive parent-child interactions. Families continue to

experience psychosocial stress and risk when residing in supportive housing sites (Gewirtz et al., 2008), but supportive housing offers increased stability, privacy and security when compared to emergency shelters or unsheltered homelessness.

Importantly, results presented here suggest that at least one critical aspect of family life can recover (or improve) after the experience of homelessness. Findings support the continued efforts of governments to obtain supportive housing for homeless families (HUD Office of Community Planning and Development, July 2008), but also point toward the need to support families prior to residence in supportive housing or self-secured permanent housing (Swick & Williams, 2006).

**Improvements.** Limited information about the length of families' residence in supportive housing only allows speculation around timing and trajectories of growth, however, it remains demonstrated that growth occurred. Tears in the fabric of family interaction can be repaired, or improve, when environmental stress lessens and families obtain resources (e.g., stable housing). Aggregate gains in effective parenting over time may also be explained from a perspective of improvement, rather than recovery. Because we do not have information regarding families' duration of residence in stable housing, we cannot exclude the possibility that parenting practices are improving (rather than recovering) over time. A bioecological systems theory supports either explanation, highlighting the importance of gaining an instrumental and psychological resource to an individual's development. According to Bronfenbrenner (1986), individuals develop within the context of increasingly distal social systems (i.e., microsystem, mesosystem, exosystem, macrosystem). Within the most proximal level, the microsystem, the individual experiences primary relationships, typically within the home or family setting.

It is within the microlevel that parent-child interaction occurs. On the broadest level, the macrosystem, individuals and families are embedded within communities. Like children, parents do not develop in isolation; they are affected by elements of every systemic level; further, these levels are interdependent, meaning that a strength or stressor emerging in one level can have reverberating effects on the individual through its impact on a different level. The experience of homelessness inarguably influences every systemic level, making it difficult to isolate the effects of homeless or housed status on interactions within the parent-child microsystem.

Adapting Bronfenbrenner's perspective to the experience of parenting while homeless, however, Garbarino, Vorrasi, and Kostelny (2002) described the importance of having a home and a community on a parent's sense of self and wellbeing, suggesting the experience of having a home provides an opportunity for "unconditional permanence". This unconditional permanence has been referred to in other literature as *ontological security* (Dupuis, 1998). An absence of this security, a sociocultural and personal resource, can lead to disruptions in parenting at every level of the parent-child relationship. For example, at the microlevel, it can threaten a parent's interactional patterns with her externalizing child, setting coercive cycles into effect. At the mesolevel, it can influence a parent's relationship with her child's teacher or school. In the exosystem, homelessness can foster a climate of powerlessness or hopelessness for parents because they experience public mothering, behavioral restrictions, and strict guidelines in order to maintain shelter for their families (e.g., Fonfield-Ayinla, 2009). Homeless mothers often have little control over their homeless status and can experience disempowerment from the very systems that seek to offer them support. Garbarino et al.

suggest the lack of unconditional permanence and powerlessness associated with parenting while homeless can have profound impacts on how a parent experiences self and interacts with her child. Therefore, although supportive housing sites are not without their weaknesses, when parents move from homeless to housed status, they may regain a sense of control and empowerment that had been absent for some time. Over time, this sense of regained efficacy may begin to influence their daily interactions with their children as they relax into a more secure environment than they had experienced while homeless.

Despite our lack of certainty regarding how long families had been receiving services and housing, one common event shared by all participants was a history of family homelessness. Although we do not have evidence to suggest the families were less stressed at later points in the study, we do know that for most families, the duration of time following the experience of homelessness increased with consecutive time points. Families were closer to the traumatic experience of homelessness at the earliest point in the study. Results suggest that the supportive housing environment offers an opportunity for parenting to improve when families' basic needs are met. Because we do not have information regarding families' histories of homelessness or their status throughout the course of the study, these optimistic results should be interpreted with caution, serving as impetus for replication rather than a blanket statement on how parenting changes following homelessness. Like the early work of Patterson and Forgatch (1990), our study was limited in that change processes may already have been occurring at the time families entered the study. When studying parenting of recently separated single mothers, they noted that the stress and disruption had likely begun growing in these

families before the separation began. In the case of the present study, it is possible that for some families, effective parenting had already begun to recover prior to the first measurement occasion. Future research with supportive housing populations should be careful to obtain detailed information about families' histories of homelessness.

An alternative explanation for improvements in parenting could relate to longitudinal measurement and children's developmental stages. We did not statistically or experimentally control for children's age in our analyses, and although most in the sample were elementary school-aged, our sample demonstrated variability in children's ages. Although testing of measurement invariance indicated positive parenting (skill encouragement, positive involvement), problem-solving skills, and coercive discipline contributed to a latent construct of effective parenting throughout the duration of the study, that does not preclude mean increases in positive parenting from being measurement-related. Increases in parenting effectiveness could be attributed to the nature of parent-child interaction and observational analysis. For example, parents may have had less opportunity to demonstrate a range of discipline practices (whether effective or ineffective) at later time points than earlier occasions; children may have behaved more appropriately in the second and third years of the study, giving coders less opportunity to observe limit setting behaviors. This may explain the decreased variance surrounding the indicators at later measurement, as well as the random effect for the quadratic slope factor being unnecessary. The discipline, problem solving, and involvement scales hold content validity throughout middle and late childhood (i.e., functional equivalence), but with observational analysis, measurement is closely tied to

interaction tasks (Kerig, 2001). Therefore, a rating scale's (e.g., Coder Impressions) validity is interdependent with the interaction tasks it accompanies.

Although this alternative explanation is worth consideration, it would hold more merit if all child participants were transitioning through the same developmental stages (i.e., from middle to late childhood) or if we had not tested measurement invariance.

When working with diverse populations in community settings, recruiting and retaining sizable samples may outweigh the benefits of controlling sample characteristics.

Findings presented here suggest that developmental stage could be an important factor for observing change in parenting effectiveness, however, and future studies designed to answer this question should explicitly sample large enough numbers of children within each age group to directly test these associations.

Finally, it is also possible we are observing regression to the mean. Variance in the effective parenting construct and its observed indicators decreased over time. The decision to approach the research question with a second-order latent growth curve approach lessens the likelihood that estimates of change reflect measurement error rather than true growth of the construct, but regression to the mean could still occur.

Examination of individual trajectory plots confirmed the observation of decreased variance from T1 to T4. This decrease may be relevant to the primary research question, however. It is possible that when adjusting to supportive housing and when more proximal to the event of homelessness, families displayed a greater range of supportive interactions because stress impacted individual families more variably. Whether for developmental reasons or for behavioral problems associated with recent homelessness, children may have demonstrated more disruptions during family interaction tasks,

fostering more negative or impatient responses from their mothers. As time passed, children aged and families may have become more stable – and either possibility would be reflected in our dyadic measure of parenting.

**Individual Differences in Initial Status and Linear Growth.** In addition to suggesting group-level intraindividual change over time, significant estimates of variance factors around the linear trend factor indicate that interindividual differences were also present; in other words, mothers varied from one another in their rate of change in effective parenting over time. A lack of variance in the quadratic factor indicates that although mothers differed from one another in their rate of linear growth over time, they tended to be relatively homogeneous in the slowing of growth. Results suggest that, like homeless children (Huntington, Bucker, & Bassuk, 2008), parents experiencing homelessness may be best conceptualized as a heterogeneous population – and potentially a population consisting of subgroups. Understanding and explaining the variability in the experiences of formerly homeless parents has important implications for determining how to best support homeless families. If parents possess different needs when it comes to psychosocial support, tailoring of intervention may offer an advantage over a universal, one-size-fits-all approach. Additionally, predictors influencing effective parenting may illuminate potential avenues for targeting. In the next sections, we discuss findings regarding the individual and contextual factors that we expected to predict variability in parenting among formerly homeless mothers.

### **Parenting Self-Efficacy**

Results suggest that a parent's perception of her ability to influence her child's behavior also influences her own behavior, both concurrently and over time. Similar to

earlier studies examining this sample (Gewirtz et al., 2009) and other studies examining the role of parenting cognitions and parenting behaviors both within and outside the context of homelessness (Elder et al., 1995, Torquati, 2002), findings provided additional evidence suggesting the importance of parenting self-efficacy in predicting parenting behaviors. Parenting self-efficacy explained a significant amount of variability in initial status and growth of effective parenting. As hypothesized, at baseline, higher degrees of parenting self-efficacy related to higher initial levels of parenting effectiveness<sup>3</sup> ( $r = -.40; p = .001$ ). Parents who believed in their ability to influence their children's behavior demonstrated more frequent effective parenting practices.

Further, parenting self-efficacy significantly predicted growth in parenting over time – the only significant predictor included in our model that explained change in parenting. The strength and direction of the standardized relationship between parenting efficacy and growth over time was surprising ( $r = .754; p = .001$ ). Our hypothesis that greater parenting self-efficacy would predict increased growth in effective parenting over time was not empirically supported; parents who perceived themselves to have an ability to influence change in their children's behavior experienced slower rates of growth in their effective parenting as time passed (see Figure 8). Further, the strength of the effect was large and practically significant. Examination of the plots in Figure 8 illustrates the pronounced impact of parenting efficacy on growth in effective parenting, particularly between T1 and T2.

When considered further, the model and figures illuminated why unexpected results occurred. Parents who possessed low levels of parenting self-efficacy at baseline

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<sup>3</sup> Recall that parenting efficacy is scored in the direction that higher values indicate lower efficacy.

experienced greater gains in effective parenting over time, but parents who reported higher efficacy scores demonstrated consistently higher levels of effective parenting over the three-year period. Parents who reported higher levels of self-efficacy seemed to demonstrate a sort of resiliency in parenting practices (DeGarmo & Forgatch, 1999; Masten et al., 1999), demonstrated by a relatively high initial status of effective parenting that was maintained over the course of the study. Again, although we can only speculate about this resiliency throughout homelessness due to lack of information on families' histories of supportive housing, parents who had reported lower levels of self-efficacy at baseline may have experienced greater psychosocial vulnerability to the stressors associated with homelessness, thereby experiencing recovery in parenting later (after securing stable housing). Importantly, the protective effect of self-efficacy extended across the entirety of the study, as parents who reported higher parenting self-efficacy experienced smaller decreases in effective parenting practices between T3 and T4. Mothers who reported low levels of parenting self-efficacy at baseline experienced more fluctuation in the effectiveness of their parenting skills; they were more vulnerable to change and less responsive parenting behaviors than mothers who reported confidence in their parenting skills. How parents felt about their abilities to parent mattered for how they interacted with their children.

Beyond Gewirtz et al. (2009), which examined the baseline data of this study, we found one other study that quantitatively assessed an element of efficacy in relation to parenting in homeless mothers. Studying the indirect effect of self-esteem (a related construct) on the relationship between stressful life events and parenting, Torquati (2002) found that mothers' self-esteem demonstrated an inverse relationship with negative

parenting skills. Similarly, in the study at hand, mothers reporting increased parenting efficacy demonstrated higher levels of effective parenting skills (including less coercive discipline). Together, results indicate that cognition and perceived personal resources play a very important role in parenting under stress. Gewirtz et al. (2009) had reflected on the importance of behavioral and cognitive elements of parenting in predicting children's adjustment. Results presented here suggest that the cognitive element of parenting is also important in explaining variance in parenting behaviors.

Torquati (2002) also noted that self-esteem fully mediated the relationship between stressful life events and unsupportive parenting (although the indirect effect did not occur for supportive parenting practices). Although we did not test an indirect relationship between stress, parenting, and parenting efficacy, our results contribute to the literature of cognitive personal resources potentially buffering the influence of stress on parenting practices. The strong relationship between parenting efficacy and effective parenting at baseline indicate that Garbarino et al.'s (2002) approach to considering the role of empowerment and security in the lives (and parent-child relationships) of homeless mothers is useful for understanding this population.

Several processes may explain the negative direction of the relationship between parenting self-efficacy and increase in effective parenting over time. First, considered in conjunction with the presence of the cross-sectional effect at baseline, the result may indicate that parents who report higher levels of self-efficacy at entrance to the study are already demonstrating more frequent effective parenting. Their baseline levels of parenting self-efficacy were already influencing their parenting practices. Further, on average, parents reporting lower levels of parenting efficacy had more "room to grow".

Although no individual parents in the study reached a ceiling of effective parenting, the parents with higher levels of self-efficacy at baseline demonstrated less pronounced growth, but maintained the higher overall levels of effective parenting than parents reporting lower efficacy levels. Perhaps parenting self-efficacy improved at later measurement occasions for those individuals reporting low efficacy at baseline; examination of parenting self-efficacy as a time-invariant predictor would better illuminate the role of parenting self-efficacy in promoting gains in effective parenting.

### **Early Risers Multilevel Prevention Program**

In this study, we used an intent-to-treat model to conceptualize family participation in a multilevel prevention program. Although families were enrolled in a larger randomized control trial, it was not the primary aim of the study at hand to test for treatment effects; studies are underway with the objective of examining program effectiveness and child adjustment outcomes. In this study, there was a non-significant correlation between ITT status (i.e. assignment to ER or SAU) and latent growth factors. The presence of aggregate improvements in effective parenting, regardless of ITT status, suggests the role of intervention and prevention in this population is complex and not yet understood. In addition, the effect of stable housing is unknown – does residence in supportive housing, in and of itself, results in improvements in parenting? Unfortunately, because we did not measure parenting practices in these families prior to their residence in supportive housing, this remains unclear.

When considering the lack of a statistically significant difference produced by program participation, it is also important to note that an intent-to-treat framework is a conservative approach for examining treatment effects in intervention research because

individuals are assigned to groups based on random assignment. The dichotomous assignment, however, does not differentiate between varying participation levels. Although this is an accurate conceptualization, collapsing dosage and participation into a dichotomous construct, rather than examining variability in participation, does not aid us in understanding mechanisms of treatment success or mechanisms of change. Future studies with the primary intention of testing treatment effects on effective parenting practices might consider parent attendance at Parenting Through Change sessions, participation in family nights through Early Risers, and child participation in the after school and summer programs. A pilot trial indicated implementation of Parenting Through Change was feasible with the homeless population (Gewirtz & Taylor, 2009), however, further studies are needed to examine program effectiveness, including analysis of subgroups with a more fine-grained approach may illuminate change processes.

### **Residential Instability and Social Support**

Contrary to study hypotheses, residential instability and social support were not empirically supported as predictors of initial status or growth in parenting. Unfortunately, our measure of residential instability may have limited the applicability of our findings. Here, residential instability was indexed by the number of times a family had changed residence in the year prior to T1. Residential instability should be measured repeatedly throughout the study to improve our understanding of how families experience residential instability after residing in supportive housing. Although number of moves before baseline is appropriate for understanding the potential influence of a history of residential instability, it does not explain how persisting residential instability might continue to influence parenting over time. Additionally, as noted earlier, number of

moves may be indicative of upward mobility rather than instability in and of itself. For some families, a move could indicate improved residence conditions. We suggest residential instability be measured more specifically and concurrently to provide a more robust indicator of mobility. In order to better understand variability in parent-child relationships of homeless families, researchers must assess mobility appropriately and examine the varying trajectories and typologies of homelessness (Danseco & Holden, 1998; Rog, Holupka, & Patton, 2007).

Regarding perceived social support, results seemed to contradict our theory and hypotheses at first glance. Because social interaction learning theories, Bronfenbrenner's bioecological systems theory, and Patterson and Forgatch's (1990) work on disruptions in parenting suggest supportive relationships (or a lack of them) in one social environment would likely influence an individual's interactions with her child, we expected higher levels of perceived social support to be a positive predictor of initial status and growth in effective parenting. Upon further consideration, however, we note Marra et al.'s (2009) work on the role of social support and parenting of homeless mothers. Although Marra and colleagues found high reported emotional and instrumental support to predict parents' self-reported parenting consistency over time, few relationships between support and other positive aspects of parenting (e.g., warmth/involvement, appropriate discipline) were observed. In fact, conflict within social support networks moderated the relationship between positive social support and effective parenting behaviors, supporting the complexity of social support networks of homeless mothers reported in the literature. In the study at hand, mothers completed the ISEL to report their perceived social support. The ISEL is a relatively positive measure of interpersonal support, tapping into a

presence of support more so than a continuum of support and conflict. Therefore, because we did not measure conflict of the mothers' social support networks in this sample, we may have been missing an important piece of the systemic puzzle.

### **Implications for Future Research**

Examining individual and group mean change over time is an important first step to describing the longitudinal nature of parenting in formerly homeless families. As a group, mothers' effective parenting increased over time, but mothers also demonstrated interindividual differences in intraindividual change. Individual variability in the linear trend and intercept growth factors suggest exploration of latent trajectory classes may strengthen the field's conceptualization of parenting in homeless families. Particularly when considered in the context of the debate on typologies of homelessness, the preliminary evidence presented here suggests more complex analyses considering latent classes of families may be beneficial. Whereas conventional growth curve analysis assumes individuals in a sample belong to the same population, growth mixture modeling approaches loosen this assumption and allow unobserved trajectory subgroups (Muthén, 2001). Researchers can then identify predictors that differentiate among subgroups. Homeless families possess a wide variety of experiences with homelessness and characteristics contributing to their residential instability (Toro, 2007; Huntington, Bassuk, & Buckner, 2008). Despite the lack of a relationship between histories of residential instability and parenting in this study (potentially because we were limited in our measurement), diversity in patterns of homelessness may indeed influence parenting. For example, researchers should examine if effective parenting trajectories differ for

families who transcend homelessness, families who are chronically homeless, and families who experience episodic patterns of homelessness.

In addition to determining if homeless families are best conceptualized as a single population or as coming from multiple subgroups, a growth mixture modeling approach allows covariates or predictor variables to influence subgroups variably (Nagin & Odgers, 2010), providing important information for intervention scientists. For example, prevention program participation may have greater influence on a class of parents demonstrating consistently low levels of supportive parenting practices than on a class of parents who demonstrate low levels of supportive parenting practices early on, but high levels of supportive parenting over time. Findings like these may suggest prevention and intervention programs may benefit from tailoring to individual or subgroup needs (Brown et al., 2008); because they can offer pragmatic and readily translatable results, these approaches offer an avenue for bridging the gap between the ivory tower and the community setting. Therefore, beyond replication, growth mixture modeling is a natural next step for investigation of parenting and family relationships in this important population.

### **Implications for Intervention**

Findings from this study also extend beyond the field of research to the field of practice. Two key results drive applicability to clinical contexts: 1) mothers demonstrated individual variability in parenting practices, and 2) parenting self-efficacy was found to be a powerful predictor of change over time. As Swick and Williams (2006) suggested, families who have experienced homelessness possess different qualities, histories, and strengths. Although broader social and political macrosystems

influence all highly mobile families, individual differences are present within this population, and clinicians should acknowledge the diversity among formerly homeless families and their parent-child relationships. Throughout this study, some mothers maintained moderately high levels of effective parenting skills. Initial levels of effective parenting and perceived parenting efficacy appeared to buffer these parents' caregiving practices from environmental stressors associated with former homelessness and supportive housing settings. Therefore, practitioners and service providers should seek to support already effective parents in the maintenance of their skills and help bolster the supportive parenting practices of caregivers demonstrating less frequent parenting effectiveness. Providers should formally or informally assess parenting efficacy of parents experiencing homelessness, working with currently homeless parents to bolster feelings of efficacy in promoting their children's development. For some parents, it may be worthwhile to intervene earlier than the supportive housing setting, while families are mobile, residing in emergency shelter, or securing transitional housing. Further, because the presence of variability in this sample indicates that some parents possess consistent strengths in their abilities to respond sensitively to their children in stressful contexts, clinicians and intervention scientists may want to explore capitalizing on the strengths of mothers within this population by considering group education formats emphasizing social construction of knowledge (Torquati, 2002).

### **Study Limitations and Strengths**

Although this study boasts a relatively large sample and more measurement occasions when compared to previous studies documenting parenting in homeless and formerly homeless families, it also possesses some methodological limitations. First, the

timing of data collection limits the extent to which findings can shed light on the processes that occur immediately following homelessness and emergency shelter stays. Because histories of homelessness were not measured in detail and families' durations spent in supportive housing are unknown, we cannot make strong inferences about particulars, such as timing of change in parenting following homelessness. Second, the study was limited in regards timing between measurements and the length of the study. Three years represents a fairly restricted portion of the span of development, particularly when considering the potential for change in the environments of recently homeless families. More frequent measurements would better elucidate change processes in effective parenting. Despite limitations, however, this study is the first longitudinal study we could find that assessed families for a period exceeding one year.

Another limitation of our study was our exclusion of unsheltered homeless families, who are very difficult to access and track due to even higher levels of mobility. Research suggests homeless families are more likely to seek shelter or "double up" with family and friends than homeless individuals, leading to smaller numbers of unsheltered homeless families than homeless individuals. Although families in our study had histories of homelessness and fall under the umbrella of sheltered homeless families (HUD, 2004), because they were residing in supportive housing at the time of participation, the generalizability of our findings to all families experiencing homelessness is limited.

Related to the length of the study and assessment schedule, the study was also limited because of participant attrition. Of the 229 dyads who enrolled in the study, 109 pairs (47.5%) continued participation at T4. Considering the high residential mobility of

participants, potential return to homelessness, and high prevalence of involvement with the child welfare or justice system, the size of this figure is simultaneously a limitation and strength of the study. Although this work fills an important gap in the literature, researchers should create and implement new ways of staying in contact with highly mobile families over longer periods of time to maximize generalizability of results. Additionally, decreasing the burden of assessment may also increase retention. With innovative research design options becoming more widely used in prevention and intervention studies (e.g., planned missingness designs), exploring new approaches to recover missing data by preventing it from the start would benefit our understanding of this population.

**Strengths.** Although the study was limited in some areas, it also possessed methodological strengths. First, to our knowledge, it is the longest study of a sample of formerly homeless families. Because we studied families over three years, we have increased understanding of the lasting effects of homelessness and the potential influence of stable housing on parent-child interactions. Although only two mechanisms for change were identified (i.e., parenting efficacy, initial levels of effective parenting), we have evidence that parenting is amenable to change in this important population. Second, the repeated measure outcome of effective parenting practices was measured through observational methods. Observational methods minimize reporter bias (Kerig, 2001), and 2LGM analyses partial out measurement error and allow for establishment of measurement invariance, therefore, the measurement model of effective parenting was particularly strong in this study. Earlier studies of parenting in homeless and formerly

homeless families have either employed self-report measures or have conducted observational analysis with cross-sectional data.

Extending this contribution, the most important strength of the study is the use of an advanced methodological approach to minimize measurement error. Rather than using traditional inferential statistical approaches, such as multiple regression, we used a 2LGM framework to examine change over time. We established strong measurement invariance, providing evidence for the longitudinal validity of the effective parenting construct in this high-risk sample. We also minimized measurement error through use of a multiple indicator approach to longitudinal structural equation modeling. Because latent growth curve factors were disattenuated from error, they represented quantitative change in a latent construct that was able to retain its qualitative properties (Widaman et al., 2001).

### **Conclusions**

From a social interaction learning perspective, parenting is an important mediator of child outcomes in stressful environments. In intervention research, some social scientists prioritize examining outcomes and indirect effects before understanding how processes of change in the targeted mediators occur in understudied populations. In this study, we examined change in effective parenting of formerly homeless families. Observed improvements in effective parenting among our sample of formerly homeless families suggested that both tangible, environmental aspects (e.g., housing) and intangible, personal resources (e.g., parenting self-efficacy) contribute to levels and growth in effective parenting over time. Although more research is needed to investigate the potential for efficacious prevention programs with this population, results suggest that

parents can maintain or improve the supportiveness of their interactions with children in the transition following homelessness. Parenting quality is amenable to change in a supportive housing setting, and mothers' perceptions of their parenting skills influence the extent to which they parent effectively.

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Figure 1  
Participant Flow Chart Detailing Recruitment and Participation

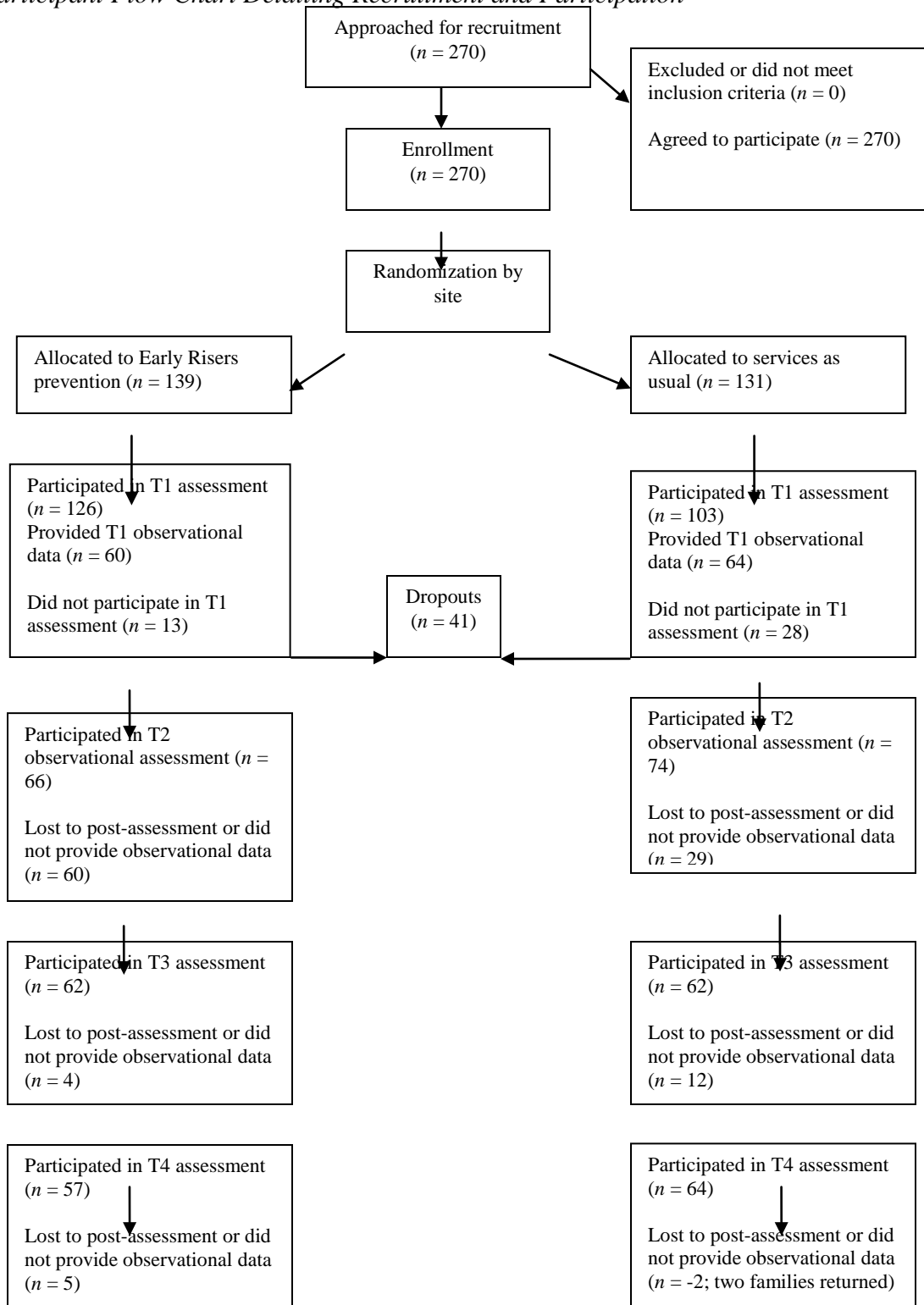
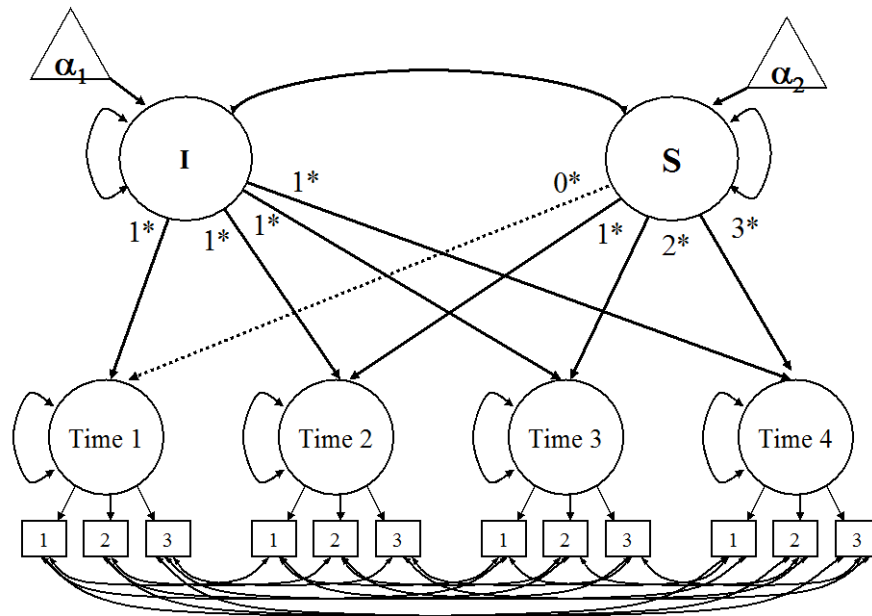
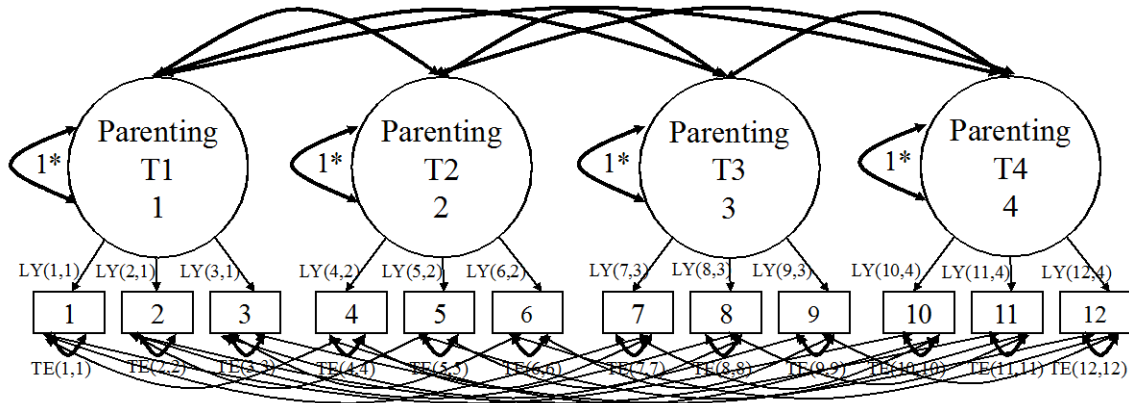


Figure 2  
*Path Diagram Representation of a Second-Order Latent Growth Curve Model with a Linear Slope*



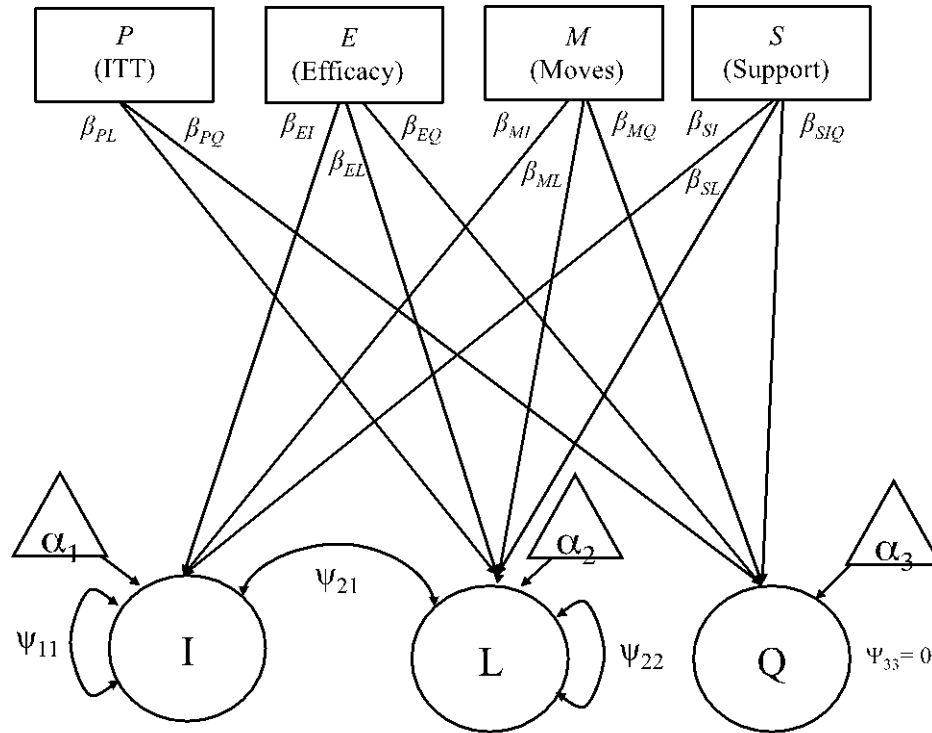
*Note.* The path diagram above depicts an example of a latent growth curve model of a latent trait factor represented by three observed indicators, measured at four occasions. “I” represents the intercept latent growth factor. “S” represents the slope latent growth factor. Time 1 - Time 4 are the repeated measure latent factors representing the psychometric construct of interest. Here, a linear slope is depicted by constraints set to evenly spaced constants on the slope growth factor.

Figure 3  
 Longitudinal Confirmatory Factor Analysis Model For Examination Of Configural Invariance



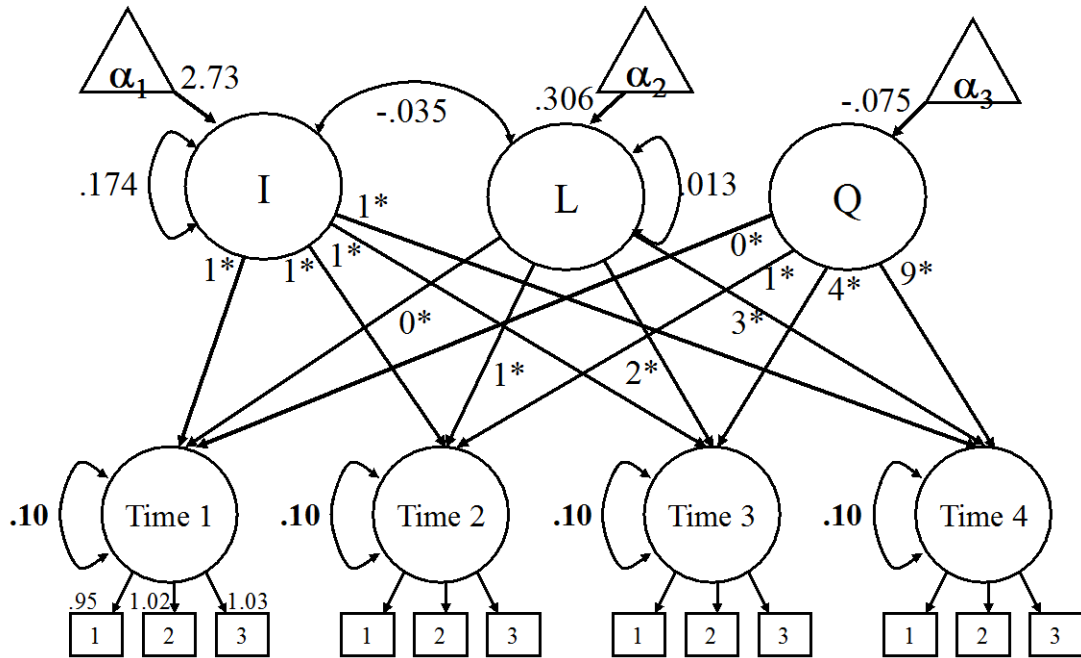
Note. The “spaghetti pot” below the indicators indicates that the item-specific residuals were allowed to correlate across measurement occasions.

Figure 4  
*Hypothesized Second-Order Fixed Quadratic Factor Latent Growth Model with Time-Invariant Covariates*



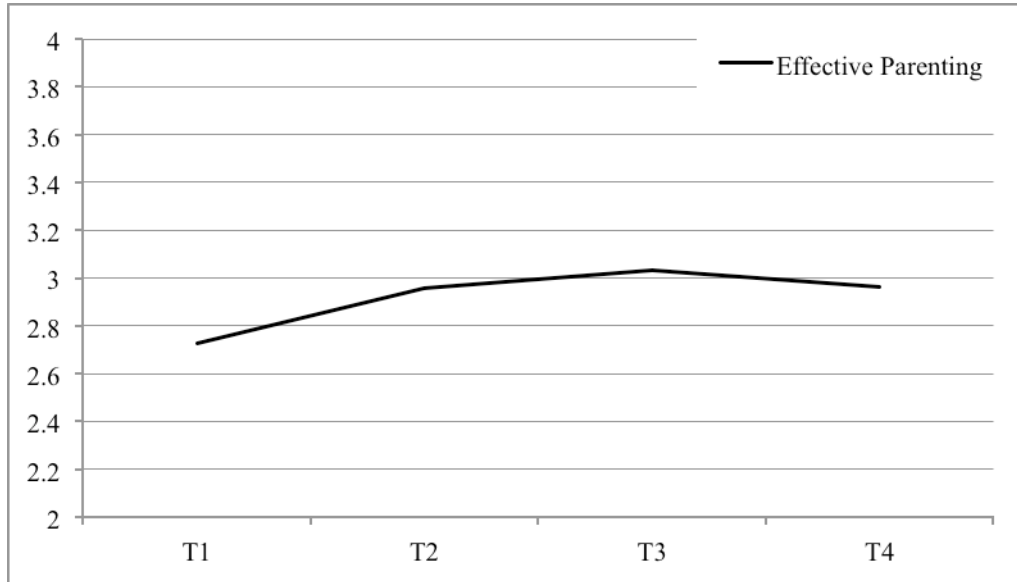
*Note.* Observed variables are depicted by rectangular shapes. “I” indicates the latent intercept factor. “L” represents the linear trend latent factor. “Q” represents the latent quadratic curve factor. The first order repeated measures factors have been trimmed from the figure for parsimony, but are included in analyses.

Figure 5  
 Second-Order Fixed Quadratic Factor Latent Growth Model Using Effects Coding  
 Method Of Parameterization



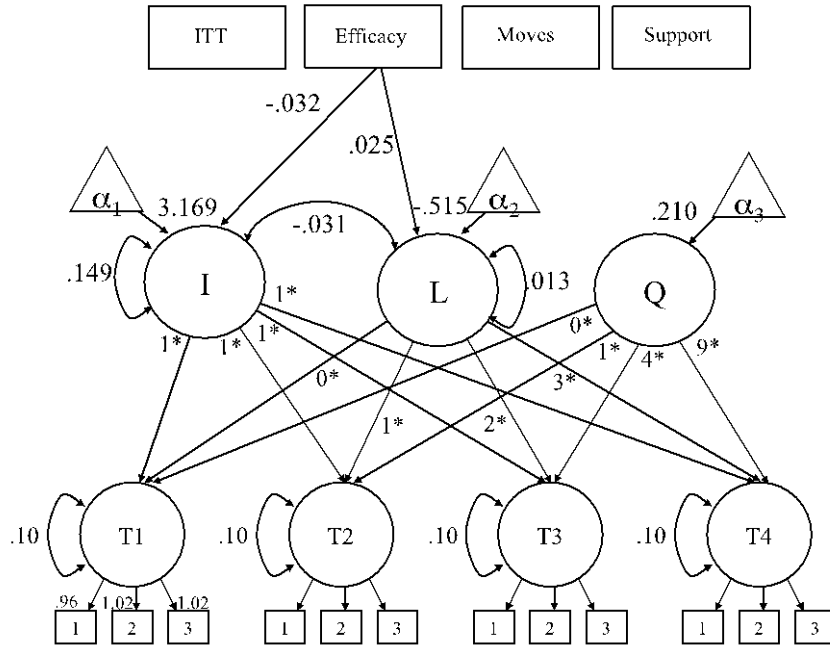
Note. Values are unstandardized parameter estimates provided in Mplus 6.11. “I” indicates the latent intercept factor. “L” represents the linear trend latent factor. “Q” represents the latent quadratic curve factor.  $\chi^2_{(48, n=229)} = 81.149$ ; RMSEA = .054<sub>(.032;.074)</sub>; CFI = .953. Item-specific residuals were allowed to correlate across measurement occasions but were not depicted for clear presentation. Item-specific intercepts and factor loadings were constrained to be equal across time points.

Figure 6  
*Visual Depiction of the Average Growth Trajectory of Effective Parenting over a Three-Year Period*



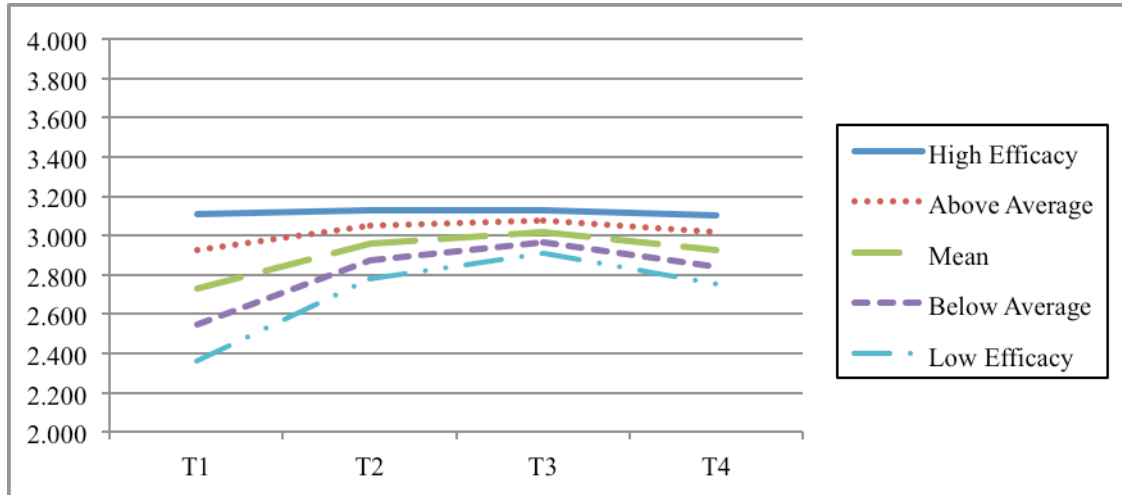
*Note.* Total sample size is 229. The trajectory demonstrates a positive linear function and a negative quadratic curve.

Figure 7  
*Second-Order Fixed Quadratic Factor Latent Growth Model with Time-Invariant Covariates Fit to Data*



*Note.* Sample size is 229. Observed variables are depicted by rectangular shapes. Only significant paths are shown. Parameter estimates that did not reach statistical significance are provided in Table 11. Model fit was acceptable:  $\chi^2_{(94, n=229)} = 120.97$ ; RMSEA = .035<sub>(.01;.05)</sub>; CFI = .954. Item-specific residuals were allowed to correlate across measurement occasions but were not depicted for clear presentation.

Figure 8  
*Trajectories of Effective Parenting when Considering Varying Levels of Parenting Self-Efficacy*



*Note.* Higher scores on the parenting self-efficacy subscale indicated lower efficacy. The scaling of the y-axis has been modified to demonstrate the trajectories more clearly. Parents who reported high parenting self-efficacy (2 SDs above the mean) demonstrated a more stable growth trajectory than parents who reported low parenting self-efficacy. Parents who possessed average levels of self-efficacy demonstrated a growth trajectory equivalent to the unconditional model.

Table 1  
*Description of Analytic Models Tested for Factorial Invariance*

<b>Model</b>	<b>Description</b>
CFA <sub>1</sub>	Appropriately specified longitudinal null model
CFA <sub>2</sub>	Initial confirmatory factor analysis (configural model)
CFA <sub>3</sub>	Factor loading invariance ( $\alpha=$ )
CFA <sub>4</sub>	Factor loading and intercept invariance ( $\alpha= + \tau=$ )

Table 2

*Description of Analytic Models Tested through Latent Growth Modeling*

<b>Model</b>	<b>Description</b>
2LGM <sub>1</sub>	Freely estimated unconditional growth model
2LGM <sub>2</sub>	Random intercept and random linear slope
2LGM <sub>3</sub>	Random intercept, random linear slope, fixed quadratic
2LGM <sub>4</sub>	Random intercept, random linear trend, random quadratic curve
2LGM <sub>5</sub>	Fixed quadratic factor model with time-invariant covariates

*Note.* The first four models are unconditional models where time is the only predictor of change. The fifth model is a conditional model of change including time-invariant covariates.

Table 3  
*Observed Sample Means and Factor Scores for Parenting Practices Variables*

Parenting practice	T1		T2		T3		T4	
	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>
Problem solving	1.83	0.800	2.08	0.666	2.28	0.578	2.16	0.517
Effective discipline	3.49	0.751	3.68	0.608	3.68	0.584	3.6	0.517
Positive parenting	2.81	0.710	3.12	0.689	3.08	0.661	3.18	0.515
Effective parenting	2.71	0.357	2.97	0.301	3.026	0.307	2.97	0.294
<i>N</i>	124		140		117		109	

*Note.* Sample size varies among measurement occasions due to sample attrition.

Table 4  
*Observed Sample Means for Time-  
Invariant Covariates*

Variable	<i>M</i>	<i>SD</i>
Parenting self-efficacy	17.31	5.48
Interpersonal support	2.16	0.485
Number of moves	1.35	1.20

*Note.* Variables were measured at T1.  
Sample size varies from parenting  
variables because some mothers did not  
participate in interaction tasks.

Table 5

*Appropriately Specified Longitudinal Null Model of Effective Parenting Construct over Four Measurement Occasions*

	T1			T2			T3			T4		
	PS1	GD1	PP1	PS2	GD2	PP2	PS3	GD3	PP3	PS4	GD4	PP4
PS1	0.508											
GD1	0.00	0.393										
PP1	0.00	0.00	0.441									
PS2	0.00	0.00	0.00	0.508								
GD2	0.00	0.00	0.00	0.00	0.393							
PP2	0.00	0.00	0.00	0.00	0.00	0.441						
PS3	0.00	0.00	0.00	0.00	0.00	0.00	0.508					
GD3	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.393				
PP3	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.441			
PS4	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.508		
GD4	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.393	
PP4	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.441
Means	2.086	3.615	3.046	2.086	3.615	3.046	2.086	3.615	3.046	2.086	3.615	3.046

*Note.* Sample size is 144. The longitudinal null model, indicator variances and means are constrained to be equal across time points.  
 $\chi^2 = 728.366$ ,  $df = 84$ ,  $p < .001$ , CFI = .000, SRMR = .429.

Table 6

*Goodness-Of-Fit Indices of Factorial Invariance CFA Models*

Model	BIC	$\chi^2$	<i>df</i>	<i>p</i>	$\Delta\chi^2$	$\Delta df$	RMSEA	(90% CI)	CFI	Pass? <sup>1</sup>
CFA <sub>1</sub>		728.366	84	.000						
Measurement Invariance Model Estimates										
CFA <sub>2</sub>	2551.699	25.668	30	0.692			0.000	.000, .050	1.00	Yes
CFA <sub>3</sub>	2528.863	32.651	36	0.629	6.983	6	0.001	.000, .051	1.00	Yes
CFA <sub>4</sub>	2526.179	59.786	42	0.037	34.118	12	0.054	.014, .084	0.97	Yes

*Note.* Total sample is 144.

<sup>1</sup> Constraint deemed tenable by examination of BIC.

Table 7  
*Respondents Providing Observational  
Data per Number of Measurement  
Occasions*

# of occasions	<i>n</i>	%
0	85	37.1%
1	4	1.7%
2	26	11.4%
3	24	10.5%
4	90	39.3%
Total	229	100%

Table 8  
*Goodness-Of-Fit Indices of Second-Order Latent Growth Curve Models*

Model	BIC	ML $\chi^2$	<i>df</i>	scaling	$c_d$	$\Delta SB \chi^2$	$\Delta df$	<i>p</i>	RMSEA	RMSEA (90% CI)	CFI
2LGM <sub>1</sub>	8626.97	81.146	48	0.905					0.055	.033, .075	0.951
2LGM <sub>2</sub>	8634.05	98.025	50	0.932	1.580	11.34	2	.003	0.065	.046, .084	0.929
2LGM <sub>3</sub>	8624.11	81.149	49	0.937	0.687	22.30	1	<.001	0.054	.032, .074	0.953
2LGM <sub>4</sub>	8633.02	72.647	46	0.944	0.830	8.99	3	.029	0.05	.026, .072	0.961

*Note.* Total sample size is 229. Correlated error has been adjusted through use of the COMPLEX command in Mplus. ML  $\chi^2$  is the maximum likelihood derived  $\chi^2$  value provided by Mplus. using the scaling correction factor and change in *df*, we computed a scaling correction value ( $c_d$ ) and a Yuan-Bentler  $\chi^2$  value to adjust for the violation of independence assumption and conduct a Satorra-Bentler difference test.  $\Delta SB \chi^2$  value is the difference in Yuan-Bentler  $\chi^2$  compared to a  $\chi^2$  distribution (using the Satorra-Bentler  $\chi^2$  difference test) to determine statistical significance. Models are compared in a nested manner, with the more constrained model determined by *df*.

Table 9  
*Unstandardized Parameter Estimates for 2LGM  
 with Fixed Quadratic Factor Fitted to Data*

<b>Fixed effects</b>	<b>Estimate</b>	<b>SE</b>
$\mu_I$ Level	2.725	0.07
$\mu_S$ Slope	0.306	0.08
$\mu_{QS}$ Quadratic Slope	-0.075	0.02
<b>Random effects</b>		
$\sigma_I^2$ Level	0.174	0.050
$\sigma_S^2$ Slope	0.013	0.006
$\sigma_{IS}^2$ Level-Slope	-0.035	0.010

*Note.* All values are robust maximum likelihood unstandardized estimates. Basis coefficients were fixed to  $\beta_t=[0, 1, 2, 3]$  for the linear trend and  $\beta_t^2=[1, 2, 4, 9]$  for the quadratic curve.

Table 10  
*Goodness-Of-Fit Indices and Model Comparisons of Baseline Change Model and Model Including Time-Invariant Covariates*

Model	ML $\chi^2$	df	scaling	c <sub>d</sub>	$\Delta$ SB $\chi^2$	$\Delta$ df	p	RMSEA	RMSEA (90% CI)	CFI	BIC
2LGM <sub>3</sub>	81.149	49	0.937					0.054	.032, .074	0.953	8615.25
2LGM <sub>5</sub>	125.851	86	0.979	0.014	3339.35	37	<.001	0.045	.027, .061	0.931	10172.16

Table 11  
*Parameter Estimates for 2LGM with Time-Invariant Covariates*

<b>Parameter</b>	<b>Estimate</b>	<b>Std. Estimate</b>
$\mu_I$ Level	3.169 (.400)	7.46 (1.37)
$\mu_L$ Linear Trend	-.515 (.507)	-2.93 (2.18)
$\mu_Q$ Quadratic Curve	.182 (.145)	4.64 (1.45)
$\sigma_I^2$ Level	.149 (.036)	.825 (.105)
$\sigma_L^2$ Slope	.013 (.006)	.414 (.242)
$\sigma_{IL}^2$ Level-Linear	<b>-0.031* (.013)</b>	-.700 (.099)
<b>Prevention Program Status</b>		
$\beta_{PL}$	0.030 (.118)	.086 (.337)
$\beta_{PQ}$	-0.008 (.038)	-.104 (.491)
<b>Parenting Self-Efficacy</b>		
$\beta_{EI}$	<b>-0.03* (.01)</b>	-.400 (.116)
$\beta_{EL}$	<b>0.025* (.012)</b>	.754 (.234)
$\beta_{EQ}$	-0.006 (.004)	-.866 (.396)
<b>Residential Instability</b>		
$\beta_{MI}$	0.029 (.056)	.083 (.158)
$\beta_{ML}$	0.015 (.068)	.104 (.458)
$\beta_{MQ}$	-0.006 (.019)	-.196 (.539)
<b>Social Support</b>		
$\beta_{SI}$	0.026 (.153)	.03 (.173)
$\beta_{SL}$	0.171 (.185)	.472 (.443)
$\beta_{SQ}$	-0.064 (.051)	-.797 (.383)

*Note.* Total sample size is 229. Correlated error has been adjusted through use of the COMPLEX command in Mplus. All values are robust maximum likelihood estimates. Standard errors are reported in parentheses. Basis coefficients were fixed to  $\beta_t=[0, 1, 2, 3]$  for the linear trend and  $\beta_t^2=[1, 2, 4, 9]$  for the quadratic curve. \* indicates  $p < .05$ .  $\beta_{PL}$  and  $\beta_{PQ}$  represent the regression coefficients for residential stability on S and Q factors.  $\beta_{EI}$ ,  $\beta_{EL}$ , and  $\beta_{EQ}$  represent the regression coefficients for residential stability on I, S, and Q factors.  $\beta_{MI}$ ,  $\beta_{ML}$ , and  $\beta_{MQ}$  represent the regression coefficients for residential stability on I, S, and Q factors.  $\beta_{SI}$ ,  $\beta_{SL}$ , and  $\beta_{SQ}$  represent the regression coefficients for residential stability on I, S, and Q factors.

## Appendix A

### Coder Impressions Scales

#### **Problem Solving**

Items are responded to once for each problem solving discussion (two times total).

For Item 1, select from:

- 1: Little or no attempt to solve the problem
- 2: Disagreement on proposed solution
- 3: Valid solution proposed, but no solution reached
- 4: Family agreed on a solution

For items 2-9, select from:

- 1: Untrue
- 2: Slightly True
- 3: Somewhat True
- 4: Very True

1. What was the extent of the problem resolution?
2. There was a wide range of solutions suggested.
3. The family proposed at least one realistic or feasible solution.
4. The family discussed the advantages and disadvantages of at least one proposed solution.
5. The family worked together as a team.
6. A plan was developed (e.g. proposal(s) made, details pinpointed, and execution elaborated).
7. The family is likely to follow through with a plan that was discussed.
8. The mom suggested at least one solution.
9. The child suggested at least one solution.

#### **Inept Discipline**

Inept discipline is reverse coded to become an effective discipline score.

For items 1-11, select from:

- 1: Doesn't fit
- 2: Rarely fits
- 3: Sometimes fits
- 4: Fits most of the time
- 5: Definitely – perfect fit

1. Overly strict, authoritarian, oppressive
2. Erratic, inconsistent, haphazard
3. Even-handed, appropriately firm when necessary\*
4. Seems to track child too closely; hover
5. Uses nagging or nattering to get compliance
6. Expresses anger/hostility while disciplining

7. Seems tentative, indecisive, or unsure of self when disciplining target child
8. Seems to discipline target child well\*
9. Threatens unlikely disciplines (e.g. consequences that are hard to enforce)
10. Seems in good control of target child\*
11. Threatens or uses physical punishment

\*Reverse coded.

### **Skill Encouragement**

For items 1-9, select from:

- 1: Does not apply
- 2: Applies sometimes
- 3: Applies most of the time
- 4: Applies all of the time

During the interaction...

1. The mother broke down the tasks into smaller steps as necessary
2. The mother encouraged the child to be self-directed/work independently in Tangoes
3. The mother provided appropriate guidance/corrections when the task became difficult
4. The mother followed up on corrections (e.g.,reinforced for correct, provided additional info child still incorrect)
5. The mother was positively responsive to the child's questions/utterances
6. The mother provided reinforcement for correct responses
7. The mother provided reinforcement for on task behavior
8. The mother used an appropriate level of reinforcement given the difficulty of the task
9. What was the level of successfulness the child seemed to be experiencing?

### **Positive Involvement**

For items 1-4 and 14-19, select from:

- 1: Never
  - 2: Hardly ever
  - 3: Sometimes
  - 4: Often
  - 5: Very often
1. What was your impression of the involvement of the mother in interaction (e.g. participation, attentiveness, questioning, active listening, body posture)
  2. What is your impression of the extent to which the mother maintained good eye contact and interactive body posture (e.g. faced the child, didn't edge away, didn't skitter around)
  3. What is your impression of the extent to which the mother showed empathy, support, and genuine concern
  4. What is your impression of the extent to which the mother treated the child with respect
  5. Rate how the mother appeared on the following bipolar adjectives\*:
    - 1: Very tense/tight/rigid
    - 2: Somewhat tense/tight/rigid
    - 3: Neutral

- 4: Somewhat relaxed/loose/flexible
- 5: Very relaxed/loose/flexible
- 6. Rate how the mother appeared on the following bipolar adjectives\*:
  - 1: Very humorless
  - 2: Somewhat humorless
  - 3: Neutral
  - 4: Somewhat humorous/pleasant humor used
  - 5: Very humorous/pleasant humor used
- 7. Rate how the mother appeared on the following bipolar adjectives\*:
  - 1: Very uncooperative/obstructive
  - 2: Somewhat uncooperative/obstructive
  - 3: Neutral
  - 4: Somewhat cooperative/helpful
  - 5: Very cooperative/helpful
- 8. Rate how the mother appeared on the following bipolar adjectives\*:
  - 1: Very openly angry/irritable/hostile
  - 2: Somewhat openly angry/irritable/hostile
  - 3: Neutral
  - 4: Somewhat composed/pleasant/calm
  - 5: Very composed/pleasant/calm
- 9. Rate how the mother appeared on the following bipolar adjectives\*:
  - 1: Very cold
  - 2: Somewhat cold
  - 3: Neutral
  - 4: Somewhat warm
  - 5: Very warm
- 10. Rate how the mother appeared on the following bipolar adjectives:
  - 1: Very rude
  - 2: Somewhat rude
  - 3: Neutral
  - 4: Somewhat polite
  - 5: Very polite
- 11. Rate how the mother appeared on the following bipolar adjectives:
  - 1: Very unpleasant
  - 2: Somewhat unpleasant
  - 3: Neutral
  - 4: Somewhat pleasant/cheerful
  - 5: Very pleasant/cheerful
- 12. Rate how the mother appeared on the following bipolar adjectives:
  - 1: Very critical
  - 2: Somewhat critical
  - 3: Neutral
  - 4: Somewhat encouraging
  - 5: Very encouraging
- 13. Rate how the mother appeared on the following bipolar adjectives:
  - 1: Very uninvolved

2: Somewhat uninvolved

3: Neutral

4: Somewhat involved

5: Very involved

14. Mother seemed to be friendly and pleasant

15. Mother seemed generally accepting

16. Mother was affectionate with child

17. Does the mother positively reinforce the child (praise, affection, material rewards, special privileges) for desired behaviors?

18. What is your impression of the extent to which the mother maintained good eye contact and interactive body posture (e.g., faced the child, didn't edge away)?

19. What is your impression of the extent to which the mother treated the child with respect?

\*Indicates the item was asked twice (once in each setting).

## Appendix B

### Parent Locus of Control Scale

### Parenting Self-Efficacy subscale

Listed below are 47 statements that involve personal beliefs concerning your relationship with your child. These are beliefs, so there are no right or wrong answers. Read each item carefully and then decide how you feel about each item.

Choose from the following scale:

- 5: Strongly agree
- 4: Mildly agree
- 3: Neutral
- 2: Mildly disagree
- 1: Strongly disagree

What I do has little effect on my child's behavior.

When something goes wrong between me and my child, there is little I can do to correct it.

\*Parents should address problems with their children because ignoring them won't make them go away.

If your child tantrums no matter what you try, you might as well give up.

My child usually ends up getting his/her way, so why try.

No matter how hard a parent tries, some children will never learn to mind.

\*I am often able to predict my child's behavior in situations.

It is not always wise to expect too much from my child because many things turn out to be a matter of good or bad luck anyway.

\*When my child gets angry, I can usually deal with him/her if I stay calm.

\*When I set expectations for my child, I am almost certain that I can help him/her meet them.

\*Indicates item is reverse-scored.

Citation:

Campis, L. K., Lyman, R. D., & Prentice-Dunn, S. (1986). The Parental Locus of Control Scale: Development and validation. *Journal of Clinical Child Psychology, 15*, 260 - 267.

## Appendix C

### Interpersonal Support Evaluation List

This scale is made up of a list of statements each of which may or may not be true about you. For each statement check “definitely true” if you are sure it is true about you and “probably true” if you think it is true but are not absolutely certain. Similarly, you should check “definitely false” if you are sure the statement is false and “probably false” if you think it is false but are not absolutely certain.

Definitely true (3)  
Definitely false (0)  
Probably true (2)  
Probably false (1)

1. There are several people that I trust to help solve my problems.
2. If I needed help fixing an appliance or repairing my car, there is someone who would help me.
3. Most of my friends are more interesting than I am.
4. There is someone who takes pride in my accomplishments.
5. When I feel lonely, there are several people I can talk to.
6. There is no one that I feel comfortable to talking about intimate personal problems.
7. I often meet or talk with family or friends.
8. Most people I know think highly of me.
9. If I needed a ride to the airport very early in the morning, I would have a hard time finding someone to take me.
10. I feel like I’m not always included by my circle of friends.
11. There really is no one who can give me an objective view of how I’m handling my problems.
12. There are several different people I enjoy spending time with.
13. I think that my friends feel that I’m not very good at helping them solve their problems.
14. If I were sick and needed someone (friend, family member, or acquaintance) to take me to the doctor, I would have trouble finding someone.
15. If I wanted to go on a trip for a day (e.g., to the mountains, beach, or country), I would have a hard time finding someone to go with me.
16. If I needed a place to stay for a week because of an emergency (for example, water or electricity out in my apartment or house), I could easily find someone who would put me up.
17. I feel that there is no one I can share my most private worries and fears with.
18. If I were sick, I could easily find someone to help me with my daily chores.
19. There is someone I can turn to for advice about handling problems with my family.
20. I am as good at doing things as most other people are.
21. If I decide one afternoon that I would like to go to a movie that evening, I could easily find someone to go with me.

22. When I need suggestions on how to deal with a personal problem, I know someone I can turn to.
23. If I needed an emergency loan of \$100, there is someone (friend, relative, or acquaintance) I could get it from.
24. In general, people do not have much confidence in me.
25. Most people I know do not enjoy the same things that I do.
26. There is someone I could turn to for advice about making career plans or changing my job.
27. I don't often get invited to do things with others.
28. Most of my friends are more successful at making changes in their lives than I am.
29. If I had to go out of town for a few weeks, it would be difficult to find someone who would look after my house or apartment (the plants, pets, garden, etc.).
30. There really is no one I can trust to give me good financial advice.
31. If I wanted to have lunch with someone, I could easily find someone to join me.
32. I am more satisfied with my life than most people are with theirs.
33. If I was stranded 10 miles from home, there is someone I could call who would come and get me.
34. No one I know would throw a birthday party for me.
35. It would be difficult to find someone who would lend me their car for a few hours.
  
36. If a family crisis arose, it would be difficult to find someone who could give me good advice about how to handle it.
37. I am closer to my friends than most other people are to theirs.
38. There is at least one person I know whose advice I really trust.
39. If I needed some help in moving to a new house or apartment, I would have a hard time finding someone to help me.
40. I have a hard time keeping pace with my friends.

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