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Antecedents and Consequences of Caregiving Structure on Young Mothers and Their Infants

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Abstract This study describes the multigenerational caregiving structure of infants born to young women, the prenatal predictors of caregiving structure, and the effects of caregiving structure on the health of young mothers and their infants 6 months postpartum. The sample consisted of 784 young mothers involved in a longitudinal study in two U.S. cities. Women were classified into eight caregiving structure groups based on the mother's report of herself as a caregiver and her selection of the baby's father and/or grandparents as caregivers. ANCOVA analyses identified predictors and 6 month postpartum outcomes of caregiving structure. Planned comparisons explored the relationships among caregiving structure groups. A majority of women reported caregiving structures other than herself and the father as caregivers (87.1%). Grandparents were indicated as caregivers by most women (62.2%). Postpartum caregiving groups differed on prenatal social support, self-esteem, attachment avoidance and anxiety, relationship status, and living with the baby's father. While mother's self esteem significantly predicted father involvement, there were no differences on predictors between when the mother and father were caregivers, versus when the mother and grandparents were caregivers. Differences existed between groups on mother and child outcomes, including parenting stress, distress, and child dysfunction. Women reported significantly less parenting stress, child dysfunction, and negative child emotions when she and the father were caregivers, versus when she and grandparents were caregivers. The family system and the intergenerational dynamics within a multigenerational caregiving structure are critical to the health and well-being of both mothers and their children.

Keywords Caregiving structure · Adolescent pregnancy · Family systems theory · Parenthood and family development · Grandmothers raising grandchildren

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Introduction

The Burden of Caregiving

The increasingly diverse caregiving structures of children born to young single mothers have warranted investigation into the impacts of caregiving structure not only on the health of these children, but also on the health of the young mothers themselves. We know that young single mothers and their children are particularly vulnerable to social and economic hardship. Children born to young single mothers are at increased risk for negative outcomes, including low birth weight, poor performance in school, affective disorders, poor health, and abuse and neglect [1–3]. Moreover, over three-quarters of young mothers rely on welfare at some point and only one-third earn their high school degree. The health and well-being of both young women and their children, however, varies greatly, and recent

literature suggests that these outcomes can vary in relation to the support of various types of caregivers, including grandparents [4, 5].

Many young single mothers do not have the support of a stable and supportive partner, which can be a risk factor for these mothers and their children [6]. Research has shown that single mothers are more likely to experience affective disorders, including depression and anxiety, often as a result of the increased exposure to multiple structural stressors, including financial strain, caregiving stress and lack of social support [7–12]. In addition, children raised by a single mother are more likely to be uninsured, miss school, and have chronic health conditions such as asthma [13].

The Influence of the Father in Caregiving

The involvement of fathers in the care of their children, whether residential or non-residential, is multifaceted. Fathers can play multiple roles, including that of an economic provider, caregiver, role model, and disciplinarian [14, 15]. Father involvement, when positive, has been associated with positive academic outcomes among school-aged children and child development [16]. While few studies have assessed the association between father involvement and child temperament among minority families or families with low incomes, some studies among predominantly white middle-class family structures have shown that father involvement is related to a less difficult and more sociable child temperament [17, 18].

Grandparents as Caregivers

Grandparents are increasingly involved in raising their grandchildren. Since the 1970s the number of children raised in households with their grandparents has doubled to over 4 million [19]. The 2008 American Community Survey reported that approximately 6.4 million grandparents were living with their grandchildren and approximately 2.6 million, or 41% of all grandparents living with grandchildren, were the primary caregivers [20]. When focusing on low-income families, welfare policy has contributed to the increasing prevalence of multigenerational caregiving structures by mandating that teen mothers live with their mothers in order to receive cash assistance [21]. Increasing expenses may also necessitate the employment of multiple family members and subsequently require child care assistance from extended family. Cultural influences may also play a role, as research suggests that the kinship model of caregiving, where grandparents, parents, siblings and friends of the family work together to raise children, is prevalent among African American and Latino families [22]. In fact, a majority of young African American women raise their children in extended family households [23, 24].

Literature has varied in terms of maternal and child health and behavior outcomes as they relate to grandparent caregiving involvement [4]. One study in particular found that children raised solely by grandparents are just as healthy as children raised by two biological parents [25–28]. Another study found that significant support from grandparents was associated with positive infant attachment [29]. Conversely, some studies have found that children with custodial grandparents and children in multigenerational households are more likely to experience delayed academic achievement and socioemotional problems [30].

Intergenerational Dynamics in Multigenerational Caregiving Structures

Structural family theory may offer insight into why children and mothers living in various family structures have differential outcomes. Structural family theory posits that families can be best understood through their hierarchy and boundaries [31–33]. In a healthy family system, members of the parental subsystem are in a clear position of authority, with responsibility for tasks associated with guidance, nurturance, and control. Weak hierarchy and unclear boundaries have been linked to negative child psychosocial and developmental outcomes and dysfunction [32–37]. The positive impact and support that grandparent involvement may provide can be negated by perceived interference, conflict over parenting decisions, and lack of clarity regarding roles and boundaries, which have been found to cause strain in these caregiving structures, particularly among co-residing multigenerational families [38–45].

Current Study

Until the last decade, research regarding the effect of caregiving structure on both maternal and child health has largely centered on variations of conjugal relationships and single parent families. The findings from these studies may be less relevant to multigenerational family structures as described previously [22]. Moreover, while the prevalence of grandparents acting as caregivers to their grandchildren increases, studies assessing both the predictors of grandparent involvement along with the effect of grandparent involvement on maternal and child outcomes is limited [21]. In addition, few studies, if any, identify both predictors and outcomes of caregiving structure defined as a broader multigenerational construct. As described above, many studies report predictors and outcomes of father and grandparent involvement as exclusive dichotomous assessments. In an effort to address these gaps in the literature, the specific aims of this study are to (1) describe caregiving structure among low income young mothers from a multigenerational

perspective; (2) determine maternal predictors of caregiving structure, including demographic and psychosocial factors; and (3) assess the effects that caregiving structure has on both maternal and child outcomes 6 months postpartum, including infant temperament and parenting stress.

Method

Participants and Procedures

Data for this study come from baseline and follow-up interviews collected from pregnant women ages 14–25 enrolled in a randomized controlled trial conducted in two cities: New Haven, CT and Atlanta, GA. Participants were recruited over 40 months between 2001 and 2005 as described in Kershaw et al. 2007 [46] from 2 university-affiliated obstetrics and gynecology clinics that largely serve minority women with limited resources. The randomized controlled trial focused on different HIV prevention interventions and group versus individual prenatal care. Inclusion and exclusion criteria for the randomized control trial included being pregnant at less than 24 weeks gestation; being no older than 25 at last birthday; having no severe medical problem requiring individualized assessment and tracking as ''a high-risk pregnancy'' (e.g., diabetes, hypertension, HIV); being able to speak English or Spanish; and having a willingness to be randomized. Of the 1,542 eligible young women that were randomly approached by research assistants in the two obstetrics and gynecology clinics, 1,047 enrolled in the randomized controlled trial. Women who chose to enroll in the study were more likely to be African-American, older, and at a later gestational age at initial screening than those who refused to participate (all $P < .05$). All participants provided informed consent for participation and study procedures adhered to strict ethical principles as enforced by the institutional reviews boards and human investigations committees.

Of the 1,047 participants, 787 (75.2%) completed the 6-months postpartum assessments. Three participants were missing data on the caregiving structure variable resulting in a final sample size for this study of 784. There were no significant differences between participants included in these analyses and those excluded ($n = 263$) on any demographic or key study variables. Participants were randomized into three experimental groups that differed on an HIV prevention intervention and the prenatal care setting (i.e. group vs. individual). All analyses controlled for experimental group.

Participants completed audio computer assisted self interviews (A-CASI) at baseline, which was during their second trimester to minimize the effect of immediate emotional and physical changes as a result of pregnancy and to include women who have their first prenatal care visit in either the first or second trimester. A-CASI follow-up interviews were conducted again in the third trimester, 6-months postpartum and 12-months postpartum, although this study included only prenatal and 6-months postpartum assessments. A-CASI interviews allow participants to hear the questions through earphones and read questions on a computer screen, aiding in participation of individuals with low reading ability. Moreover, A-CASI interviews have been shown to have high reliability and validity of report of stigmatized and sensitive material [47–49]. Participants were paid $20 for each interview.

Measures

Demographic Variables

All demographic variables were assessed at baseline, during the second trimester of pregnancy. Participants' *age* was recorded and *race* was categorized as African-American, White, Latina or other. *Relationship status* was dichotomized as not in a romantic relationship or in a romantic relationship by combining two questions. If the mother was in a relationship with the father of the baby or with someone else at baseline, she was categorized as in a relationship. *Co-habiting with the father of the baby* was categorized as living with the father of the baby or not living with him. *Employment and school status* was combined into a dichotomous variable to reflect if they were in school, employed full-time or employed part-time vs. unemployed and not attending school.

Caregiving Structure

Caregiving structure was assessed 6-months postpartum using two questions. The first question asked the mother of the baby "who takes care of the baby most of the time?" and allowed respondents one selection from a list of possible caregivers. The second question asked the mother of baby "who else helps take care of the baby?" and allowed respondents multiple selections from the same list. Because over 90% of the mothers answered that they were a caregiver in either the first or second question, we only classified her as a caregiver if she marked that she was a caregiver in the first question, indicating that she was the primary caregiver. Alternatively, if the mother of the baby indicated that the baby's father or the baby's grandparent(s) were caregivers in either question, they were classified as caregivers. Eight caregiving structure groups were formed based on these classifications. These structures reflect whether the mother is the primary caregiver, and whether the father and grandparents are caregivers in any capacity.

Predictors of Caregiving Structure

Social Support Social support was assessed at baseline using a 7-item subscale of the Social Relationship Scale [50], which assessed perceived availability of emotional and material support on a 5-point scale (e.g., to talk about an interpersonal problem, to borrow money in a medical emergency, or for advice in making a decision). The 7 items were summed to form a total score, with higher scores indicating more social support ($\alpha = .91$).

Social Conflict Seven items within the social conflict subscale of the Social Relationship Scale assessed the perceived degree of social conflict in an individual's everyday social network at baseline [50]. The first 6 items asked the participant to rate perceived degree of conflict from "Definitely Not" to "Definitely Yes" in interpersonal relationships in the past month (e.g., people getting on her nerves or feeling tense from arguing or disagreeing), while the final item, which was reverse scored, asked the participant to indicate how often she had been involved in a social interaction or exchange that was unpleasant or distressing in the past month from "every day" to "not at all." Participant responses to a 5-point scale were summed to form a total score, with higher scores indicating more social conflict ($\alpha = .83$).

Perceived Stress Perceived stress was assessed at baseline using the 10-item Perceived Stress Scale (PSS), which assessed the degree to which individuals perceive certain situations in their lives to be stressful in the prior month on a 5-point scale from "Never" to "Very Often" [51]. The items focused on how unpredictable, uncontrollable, and overloaded individuals perceive their lives to be. Responses were summed to form a total score, with higher scores indicating more stress ($\alpha = .81$).

Self Esteem Participants responded to the 10-item Rosenberg Self-Esteem Scale ($\alpha = 0.86$) at baseline [52]. Some of the questions were reworded from the original scale, but the content was not significantly altered. For example, we changed the original statement, "I feel that I am a person of worth, at least on equal plane with others," to, "I feel that I am as good as other people." The wording of the questions was tailored to better fit the reading level and age of participants. Participants responded on a 4-point scale from "Strongly Disagree" to "Strongly Agree" and given an average score based on their responses, with higher scores indicating more self esteem ($\alpha = .85$).

Attachment The 18-item Adult Attachment Scale-Revised (AAS-R) was used to capture two conceptual attachment factors: *attachment anxiety* and *attachment avoidance* [53, 54] at baseline, which have both been shown to predict attitudes about and characteristics of a romantic relationship. The measure consisted of a 12-item avoidance subscale and a 6-item anxiety subscale, which was modified by dropping two questions that had low total-item correlations. Items from each subscale were summed to form total anxiety and avoidance scores, with higher scores on the subscales indicating more anxiety and more avoidance ($\alpha = .68$ and .74 respectively) [55].

Outcomes of Caregiving Structure

Parenting Stress Two 12-item subscales of the short form of the Parenting Stress Index (PSI) assessed two subscales 6 months postpartum, including *distress* and *parent–child dysfunction* [56]. Participants responded to items including, "I feel trapped in my responsibilities as a parent" and "My child smiles at me much less than I expected" on a 5-point scale ranging from "Strongly Disagree" to "Strongly Agree." Responses were summed to form subscale totals and a total parenting stress score, with higher scores indicating more stress on both the subscales and total scale ($\alpha = .88$).

Infant Temperament The *Negative Emotions* and *Positive Emotions* subscales of the Revised Infant Temperament Questionnaire (R-ITQ) assessed mother-report of difficult temperament in infants 6-months postpartum [57]. Participants responded on a 6-point scale to each of the 5-item subscales. Based on the sums of their responses, participants were given negative emotions and positive emotions subscale scores, and a total infant temperament score, with higher scores on all scales indicating more negative emotions, more positive emotions and more positive temperament overall, respectively ($\alpha = .71$ positive emotions, .68 negative emotions, .71 total).

Data Analysis

To address the first aim of describing the caregiving structure of the participants, we conducted descriptive analyses to illustrate the socio-demographic makeup of the participants and to describe the frequencies of the caregiving structure groups. To meet the second aim of identifying baseline predictors of caregiving structure groups, we conducted ANCOVA analyses comparing the caregiving structure groups on continuous predictors. For dichotomous outcomes, we performed logistic regression analyses. Even though our caregiving structure groups were the primary outcome for this analysis, given the number of groups, it was analytically easier to make caregiver group the independent variable and the predictors the outcomes controlling for any relevant covariates. While

this method technically reverses the classification of the predictor and outcome, the analysis is statistically equivalent and is based on the hypothesized model that we are testing, which is that prenatal psychosocial factors predict caregiving structure 6 months postpartum. To address the third aim of predicting differences in outcomes among caregiving structure groups, a similar approach was conducted using ANCOVA analyses.

To identify covariates we chose 5 primary covariates a priori: age, parity, race, relationship status, and experimental group. The resulting model was poor in describing data dispersion (Wilk's λs of approximately .96). This was primarily due to small relationships of age and relationship status to predictors and outcomes. To improve the model we removed age and relationship status as covariates and included social conflict 6 months postpartum because of its strong association with model outcomes. This second model did very well (Wilk's λs of approximately .04). Therefore, all analyses controlled for parity, race, social conflict, and experimental group.

Finally, we conducted a series of planned comparisons to explore relationships among the caregiver groups. To avoid confounding that could be present due to comparison groups with small sample sizes, the planned comparisons were conducted only among the groups with larger sample sizes and also among larger collapsed groups (i.e. groups where the father was involved versus a group where the father was not involved). We looked at four sets of planned comparisons: (1) father as a caregiver vs. father not caregiver (2) grandparent as a caregiver vs. grandparent not caregiver (3) mother only caregiver vs. mother & father caregivers, and (4) mother & father caregivers vs. mother & grandparent caregivers.

Results

Demographics

The average age of women was 21 years (SD = 2.6). The average gestational age at baseline interview was 18-weeks and at their 6-month postpartum interview was 27-weeks postpartum. Of the participants, 77% were African-American, 15% were Latina, and 9% White or other race/ethnicity. Thirty-six percent of participants were still in high school. Of those who were no longer in school, 40% never completed high school, 43% had a high school diploma or GED, and 17% had more than a high school education. For sixty-three percent, this was their first child, whereas 37% had 1 or more previous children.

Caregiving Structure

Caregiving structure varied greatly. A majority of women reported caregiving structures other than the mother-father as caregivers, with only 12.9% reporting that they and the father of the baby were the only caregivers. The largest caregiving group was children cared for primarily by grandparents, encompassing 22.9% of women and 69.2% of women reported that their child's grandparents were caregivers in some capacity, as described in Table 1.

Predictors of Caregiving Structure

Results showed that several predictors differed across the caregiving groups. Caregiving groups at 6-month postpartum differed on baseline social support, self-esteem, attachment avoidance, attachment anxiety, relationship status, and whether they lived with the father of the baby. Post-hoc analyses showed that highest levels of maternal social support occurred when there were more caregivers (e.g., *mother, father, and grandparents* had the most social support; *mother & father* had the second highest; the group *without mother, grandparent and father as caregivers* had the lowest social support). Similarly described in Table 2, the 3 groups with the highest baseline maternal self-esteem were when the father was a caregiver with another caregiver (e.g., *mother & father*; *father & grandparent*; and *mother, father, & grandparent*). However, the 2 groups with the lowest maternal self-esteem were those for which the grandparent was a caregiver and the father was not (e.g., *grandparent alone*; *mother & grandparent*).

Table 1 Caregiving structure group definitions and frequencies

Mother is included as a caregiver only if she indicated that she was the primary caregiver. Father and grandparent were included as caregivers if they were listed as a primary or secondary caregiver

	Mother primary caregiver	Father caregiver	Grandparent caregiver	% of sample ($N = 784$)
Mother, grandparent and father not caregivers				3.2
Mother only caregiver	X			11.9
Father only caregiver		X		2.8
Grandparent only caregiver			X	22.9
Mother and father caregivers	X	X		12.9
Mother and grandparent caregivers	X		X	15.5
Father and grandparents caregivers		X	X	12.0
Mother, father & grandparents caregivers	X	X	X	18.8

Table 2 Baseline predictors of caregiving structure 6-months postpartum ($N = 784$)

	Mother, grandparent and father not care givers		Mother only caregiver		Father only caregiver		Grandparent only caregiver		Mother & father caregivers		Mother & grandparent caregivers		Father & grandparent caregivers		Mother, father & grandparent caregivers		*P*
	M	SE	M	SE	M	SE	M	SE	M	SE	M	SE	M	SE	M	SE	
Social support	27.50	1.28	27.59	0.64	28.89	1.21	28.80	0.44	29.69	0.64	29.85	0.54	30.17	0.61	30.65	0.49	0.004
Perceived stress	19.75	1.25	18.16	0.63	20.18	1.18	18.16	0.43	17.04	0.63	17.92	0.53	17.26	0.59	17.83	0.48	0.217
Self-esteem	33.62	1.16	32.92	0.58	33.24	1.10	32.11	0.40	34.57	0.58	32.91	0.49	33.94	0.55	34.22	0.45	0.006
Attachment avoidance	3.06	0.14	2.83	0.07	2.66	0.13	2.73	0.05	2.85	0.07	2.77	0.06	2.61	0.07	2.68	0.05	0.033
Attachment anxiety	2.58	0.20	2.15	0.10	1.74	0.19	2.10	0.07	1.88	0.10	2.15	0.09	1.78	0.10	1.87	0.08	<0.001
Age	20.18	0.57	20.83	0.28	21.26	0.53	20.28	0.20	21.03	0.28	20.44	0.24	20.33	0.27	20.03	0.22	0.068
	% Yes		% Yes		% Yes		% Yes		% Yes		% Yes		% Yes		% Yes		
Planned the pregnancy	24.00		20.43		40.91		22.91		30.69		17.36		25.53		25.85		0.270
In a relationship	76.00		66.67		90.91		0.76		87.13		69.42		87.23		90.48		0.001
Live w/father of baby	0.00		12.90		50.00		18.99		53.47		0.00		39.36		11.56		0.001
In school/employed	72.00		61.29		68.18		52.51		48.51		53.72		60.64		61.22		0.155

Mother is included as a caregiver only if she indicated that she was the primary caregiver. Father and grandparent were included as caregivers if they were listed as a primary or secondary caregiver. All variables are from mother self-report. Predictor variables that differed significantly across caregiving groups are listed in bold

Planned comparisons showed that when the father was a caregiver at 6-months postpartum, participants reported more baseline social support ($P < .01$), self-esteem ($P < .001$), and significantly less attachment anxiety ($P < .001$) than when the father was not a caregiver. When the grandparents were caregivers compared to not caregivers, participants had more baseline social support ($P < .05$), less attachment avoidance ($P < .001$), were younger ($P < .01$), and were less likely to use alcohol ($P < .01$), and marijuana ($P < .05$). When the *mother and father* were the caregivers versus the *mother only*, participants had higher baseline self-esteem ($P < .05$). Finally, there were no differences between when the *mother and father* were the caregiver versus when the *mother and grandparents* were the caregiver on predictor variables.

Outcomes of Caregiving Structure

Next, we compared caregiving groups on outcomes at 6-months postpartum. Results, as described in Table 3, showed overall differences between groups on parenting stress total ($P < .001$), parenting distress ($P < .05$), and parenting child dysfunction ($P < .001$). Results showed the highest maternal parenting stress total and maternal distress among the group *mother, grandparent and father not caregivers*, and *mother only* caregiver, and the lowest dysfunction among the group where the *mother, father, and grandparent* are caregivers and the group where the *mother and father* are caregivers. Planned comparisons showed that when the father was a caregiver, participants had significantly less parenting stress, parenting distress, and parenting child dysfunction (all $P < .001$). However, there were no differences on parenting and child outcomes when the grandparent was a caregiver compared to when the grandparent was not a caregiver. When the *mother and father* were caregivers, participants had significantly less parenting stress ($P < .01$), parenting distress ($P < .05$), and parent–child dysfunction ($P < .01$) compared to when the *mother was the only caregiver*. Finally, when the *mother and father* were caregivers, participants had significantly less parenting stress, parent child dysfunction, and reported the child had less negative emotions (all $P < .05$) compared to when the *mother and grandparents* were the caregivers. No differences across caregiving groups were found related to infant temperament subscales and the total scales.

Discussion

Our results confirm previous evidence that both father involvement and grandparent involvement in caregiving affect maternal and child health. Women who reported more positive psychosocial factors, including more social support and greater self-esteem, at baseline were more likely to report father involvement and grandparent involvement 6-months postpartum. It is possible that women with a more positive environment and relationships with family and the baby's father are likely to continue to live in a more positive environment postpartum. Moreover, women who have higher self esteem, greater social support and fewer attachment issues, may be more capable of maintaining positive relationships with both their partner and parents, thus making these parties more likely to be involved as caregivers of the new baby over time. These findings suggest that practitioners may be able to use brief psychosocial assessments to predict

Table 3 Parenting and child outcomes of caregiving structure 6-months postpartum ($N = 784$)

Variables	Mother, grandparent and father not caregivers		Mother only caregiver		Father only caregiver		Grandparent only caregivers		Mother & father caregivers		Mother & grandparent caregiver		Father & grandparent caregivers		Mother, Father & grandparent caregivers		*P*
	M	SE	M	SE	M	SE	M	SE	M	SE	M	SE	M	SE	M	SE	
Parenting stress																	
Distress	29.48	1.79	30.27	0.96	27.69	1.96	28.21	0.69	26.99	0.92	28.36	0.85	26.25	0.99	26.43	0.76	0.043
Child dysfunction	20.53	1.21	17.95	0.65	18.66	1.32	19.02	0.47	15.90	0.62	18.25	0.57	17.79	0.67	15.89	0.51	0.001
Total	50.00	2.54	48.22	1.36	46.35	2.77	47.23	0.98	42.89	1.30	46.60	1.20	44.04	1.41	42.32	1.08	0.001
Infant temperament																	
Negative emotions	10.18	0.98	11.97	0.52	12.96	1.07	11.75	0.38	10.37	0.50	11.64	0.46	12.00	0.54	11.00	0.42	0.089
Positive emotions	21.94	0.92	23.90	0.49	24.25	1.00	24.57	0.35	24.75	0.47	24.53	0.43	25.14	0.51	24.51	0.39	0.132
Total	46.76	1.46	46.93	0.79	46.29	1.60	47.82	0.57	49.38	0.75	47.90	0.69	48.14	0.81	48.50	0.63	0.341

Mother is included as a caregiver only if she indicated that she was the primary caregiver. Father and grandparent were included as caregivers if they were listed as a primary or secondary caregiver. All variables are from mother self-report and report about her baby. Outcome variables that differed significantly across caregiving groups are listed in bold

the type of caregiving structure that might evolve for the new baby postpartum.

The caregiving structure formed around the new baby had clear associations with both maternal and child health outcomes as well. Father involvement had the greatest positive association, with mothers reporting less parenting stress, parenting distress and child dysfunction when the father of the baby was involved, regardless of grandparent involvement. On the other hand, mothers reporting that a grandparent was also a caregiver were more likely to experience more parenting stress, child dysfunction and more child negative emotions compared to mothers co-parenting with the father of the baby. This evidence suggests that caregivers are not necessarily functionally equivalent and, consistent with structural family theory, that adolescent mothers may experience strained relationships with their mothers leading to greater parenting stress and more child health and behavior problems. Public health interventions that seek to support mothers and families making the transition to parenthood may wish to focus on this relationship between the baby's mother and grandmother if they are co-residing as a potential opportunity to improve the functioning and stability of the caregiving structure and the resulting psychosocial outcomes for both the baby and the mother. Moreover, if practitioners are better able to predict the caregiving structure that will evolve for a young pregnant woman over time, they may be able to proactively mitigate the risks for poor health outcomes that are associated with certain caregiving structures through tailored interventions.

While this study is one of the few to assess both predictors and outcomes of multigenerational caregiving structure, it is not without limitations. The study assessed caregiving structure from the mother's perspective only and did not provide a description of the quantity or quality of the caregiving from any individual involved. Although all analyses controlled for age of the participant, mothers age 14–25 that were at varying developmental stages were also included in the study, which may have biased the results toward the null. Moreover, this study focused on grandparents as extended family caregivers; however, many families may also involve aunts, uncles and cousins to manage the care of the children. Moreover, this analysis focused on family structure as a snapshot at one time point, 6 months postpartum, while social support and parent involvement may likely change over time. It would also be important from a demographic standpoint to understand how caregiving structures change over time for infants and children born to young women, as well as understand the predictors of changes in caregiving structure over time in order to further develop tailored interventions that stabilize a caregiving structure for a child over time. Regardless, this study provides a unique analysis into both predictors and maternal and child health outcomes 6 months postpartum.

The findings from this study suggest that the family system and potentially the dynamics within the intergenerational system are critical to the health and well-being of both mothers and children raised within a multigenerational family structure. Research shows that successes exist where roles and expectations have been successfully negotiated within these multigenerational family structures [58]. Programs to strengthen young families should address caregiving structure and intergenerational dynamics to improve and sustain both maternal and child health outcomes.

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References

1. Moore, K. A., Morrison, D. R., & Greene, A. D. (1997). Effects on the children born to adolescent mothers. In R. Maynard (Ed.), *Kids having kids*. Washington, DC: The Urban Institute Press.
2. Moore, K. A., Morrison, D. R., & Greene, A. D. (1997). Children of early child bearers as young adults. In R. Maynard (Ed.), *Kids having kids*. Washington, DC: The Urban Institute Press.
3. Wolfe, B., & Peroze, M. (1997). Teen children's health care and health use. In R. Maynard (Ed.), *Kids having kids*. Washington, DC: The Urban Institute Press.
4. Thomas, J. L., Sperry, L., & Yarbrough, M. S. (2000). Grandparents as parents: Research findings and policy recommendations. *Child Psychiatry and Human Development, 31*(1), 3–22.
5. Amato, P. R. (2005). The impact of family formation change on the cognitive, social, and emotional well-being of the next generation. *Future of Children, 15*(2), 75–96.
6. Hamilton, B. E., Martin, J. A., Ventura, S. J. (2007). *Births: Preliminary data for 2006.* National vital statistics reports, Vol. 56, no 7.
7. Avison, W. R., & Davies, L. (2005). Family structure, gender, and health in the context of the life course. *Journals of Gerontology. Series B, Psychological Sciences and Social Sciences, 60*, 113–116.
8. Benzeval, M. (1998). The self-reported health status of lone parents. *Social Science and Medicine, 46*(10), 1337–1353.
9. Brown, G. W., & Moran, P. M. (1997). Single mothers, poverty and depression. *Psychological Medicine, 27*(1), 21–33.
10. Demo, D. H., & Acock, A. C. (1996). Singlehood, marriage, and remarriage—The effects of family structure and family relationships on mothers' well-being. *Journal of Family Issues, 17*(3), 388–407.
11. Kitson, G. C., & Holmes, W. (1992). *Portrait of divorce: Adjustment to marital breakdown*. New York: Guilford Press.
12. Simons, R. L., Johnson, C., & Lorenz, F. O. (1996). Family structure differences in stress and behavioral predispositions. In R. L. Simons (Ed.), *Understanding differences between divorced and intact families: stress, interaction, and child outcome* (pp. 45–64). Thousand Oaks, CA, US: Sage Publications.
13. Bloom, B., & Cohen, R. A. (2007). Summary health statistics for US children: National health interview survey, 2006. *National Center for Health Statistics. Vital Health Statistics, 10*(234), 1–79.
14. Amato, P. R. (1998). More than money? Men's contributions to their children's lives. In P. R. Amato (Ed.), *Men in families*. New Jersey: Lawrence Erlbaum Associates Mahwah.

15. Halle, T., *The Meaning of Father Involvement for Children. Child Trends Research Brief.* 1999.
16. Biller, H. B., & Kimpton, J. L. (1997). The role of the father in child development. In M. E. Lamb (Ed.), *The father and the school-aged child* (3rd ed., pp. 143–161). New York: Wiley.
17. McBride, B. A., Schoppe, S. J., & Rane, T. R. (2002). Child characteristics, parenting stress, and parental involvement: Fathers versus mothers. *Journal of Marriage and the Family, 64*(4), 998–1011.
18. Volling, B. L., & Belsky, J. (1991). Multiple determinants of father involvement during infancy in dual-earner and single-earner families. *Journal of Marriage and the Family, 53*(2), 461–474.
19. Bryson, K., & Casper, L. M. (1999). *Current population reports: Coresident grandparents and grandchildren*. Washington, DC: US Bureau of the Census.
20. United States, C.B. (2008). *2008 American community survey: Table S1002*. Washington, D.C: U.S.C. Bureau.
21. Pittman, L. D. (2007). Grandmothers' involvement among young adolescents growing up in poverty. *Journal of Research on Adolescence, 17*(1), 89–115.
22. Baer, J. (1999). The effects of family structure and SES on family processes in early adolescence. *Journal of Adolescence, 22*(3), 341–354.
23. Pearson, J. L., Hunter, A. G., Ensminger, M. E., & Kellam, S. G. (1990). Black grandmothers in multigenerational households: Diversity in family structure and parenting involvement in the woodlawn community. *Child Development, 61*, 434–442.
24. Saluter, A. F., & Lugaila, T. A. (1998). *Marital status and living arrangements: March 1996, In: Current population reports, population characteristics, series P- 20, no. 496*. Washington, DC: US Department of Commerce.
25. Solomon, J. C., & Marx, J. (1995). To grandmothers house we go—Health and school adjustment of children raised solely by grandparents. *Gerontologist, 35*(3), 386–394.
26. Black, M. M., et al. (2002). Behavior and development of preschool children born to adolescent mothers: Risk and 3-generation households. *Pediatrics, 109*(4), 573–580.
27. Unger, D. G., & Cooley, M. (1992). Partner and grandmother contact in black-and-white teen parent families. *Journal of Adolescent Health, 13*(7), 546–552.
28. Simons, L. G., et al. (2006). Parenting practices and child adjustment in different types of households—A study of African American families. *Journal of Family Issues, 27*(6), 803–825.
29. Spieker, S. J., & Bensley, L. (1994). Roles of living arrangements and grandmother social support in adolescent mothering and infant attachment. *Developmental Psychology, 30*(1), 102–111.
30. Pittman, L. D., & Boswell, M. K. (2007). The role of grandmothers in the lives of preschoolers growing up in urban poverty. *Applied Developmental Science, 11*(1), 20–42.
31. Faber, A. J. (2002). The role of hirarchy in parental nurturance. *American Journal of Family Therapy, 30*, 73–84.
32. Minuchin, S. (1974). *Families & family therapy* (p. 268). Oxford, England: Harvard U Press.
33. Shaw, D. S., et al. (2004). The development of family hierarchies and their relation to children's conduct problems. *Development and Psychopathology, 16*, 483–500.
34. Bartram, M. H. (1996). Clarifying subsystem boundaries in granfamilies. *Contemporary Family Therapy, 18*(2), 267–277.
35. Minuchin, S., & Fishman, H. C. (1975). *Family therapy techniques*. Boston: Harvard University Press.
36. Wood, B. (1985). Proximity and hierarchy: Orthogonal dimensions of family interconnectedness. *Family Process, 24*, 487–507.
37. Madden-Derdich, D. A., et al. (2002). The boundary violations scale: An empirical measure of intergenerational boundary violations in families. *Journal of Marital & Family Therapy, 28*(2), 241–254.
38. Colletta, N. D. (1981). Social support and the risk of maternal rejection by adolescent mothers. *The Journal of Psychology, 109*, 191–197.
39. Panzarine, S. (1986). Stressors, coping and social supports of adolescent mothers. *Journal of Adolescent Health Care, 7*, 153–161.
40. de Anda, D., & Becerra, R. M. (1984). Support networks for adolescent mothers. *Social Casework, 65*(3), 172–181.
41. Deleire, T., & Kalil, A. (2002). Good things come in threes: Single-parent multigenerational family structure and adolescent adjustment. *Demography, 39*(2), 393–413.
42. Richardson, R. A., Barbour, N. B., & Bubenzer, E. G. (1991). Bittersweet connections: Informal social networks as sources of support and interference for adolescent mothers. *Family Relations, 40*, 430–434.
43. Brooks-Gunn, J., & Chase-Lansdale, L. (1991). Children having children: Effects on the family system. *Pediatric Annals, 20*(9), 467–481.
44. Chase-Lansdale, P., Brooks-Gunn, J., & Zamsky, E. S. (1994). Young African-American multigenerational families in poverty: Quality of mothering and grandmothering. *Child Development, 65*(2), 373–393.
45. Goodman, C., & Silverstein, M. (2002). Grandmothers raising grandchildren: Family structure and well-being in culturally diverse families. *The Gerontologist, 42*(5), 676–689.
46. Kershaw, T. S., et al. (2007). Avoidance, anxiety, and sex: The influence of romantic attachment on HIV-Risk among pregnant women. *AIDS and Behavior, 11*(2), 299–311.
47. C'De Baca, J., et al. (1997). Use of computer interview data to test associations between risk factors and pregnancy outcomes. *Computers and Biomedical Research, 30*(3), 232–243.
48. Des Jarlais, D.C., & Turner, C V. (1998) *Audio-CASI versus interviewer obtained survey from participants in syringe exchange programs.,* In *Paper presented at the North American syringe exchange convention*: Baltimore, Maryland.
49. Turner, C. F., et al. (1998). Adolescent sexual behavior, drug use, and violence: Increased reporting with computer survey technology. *Science, 280*(5365), 867–873.
50. O'Brien, K., et al. (1993). Social relationships of men at risk for AIDS. *Social Science and Medicine, 36*, 1161–1167.
51. Cohen, S., Kamarck, T., & Mermelstein, R. (1983). A global measure of perceived stress. *Journal of Health and Social Behavior, 24*, 385–396.
52. Rosenberg, M. (1965). *Society, the adolescent self-image*. Princeton, NJ: Princeton University Press.
53. Gallo, L. C., & Smith, T. W. (2001). Attachment style in marriage: Adjustment and repsonses to interaction. *Journal of Social and Personal Relationships, 18*(2), 263–289.
54. Sanford, K. (1997). Two dimensions of adult attachment: Further validation. *Journal of Social and Personal Relationships, 14*(1), 133–143.
55. Collins, N. L., & Read, S. J. (1990). Adult attachment, working models, and relationship quality in dating couples. *Journal of Personality and Social Psychology, 58*(4), 644–663.
56. Abidin, R. R. (1997). Parenting Stress Index: A measure of the parent-child system. In C. Zalaquett & R. J. Wood (Eds.), *Evaluating stress: A book of resources* (pp. 277–291). Lanham, MD: Scarecrow Press.
57. Carey, W. B., & McDevitt, S. C. (1978). Revision of the infant temperament questionnaire. *Pediatrics, 61*(5), 735–739.
58. Wakschlag, L. S., Chase-Lansdale, L., & Brooks-Gunn, J. (1996). Not just ghosts in the nursery: Contemporaneous intergenerational relationships and parenting in young African American families. *Child Development, 67*, 2131–2147.