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INTERDEPENDENCE OF STRESS PROCESSES AMONG AFRICAN AMERICAN FAMILY MEMBERS: INFLUENCE OF HIV SEROSTATUS AND A NEW INFANT

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Abstract

This study makes a theoretical contribution to stress process research by using a systemic approach to contextualize individual outcomes within the framework of other family members' experience. Utilizing a mixed model approach, indicators of the stress process of urban low-income HIV⁺ African American recent mothers were found to affect the psychological distress and perceived adequacy of coping of multiple other family members. These relationships were found to be strongest proximal to birth and to be exacerbated by HIV infection. Social support to the mother was found to have differential effects depending on whether it was from the immediate family or outside sources. HIV infection of the recent mother was found to affect family members both through relationships of the mother's stress process and through their own coping responses.

Keywords

Stress process; Systemic process; Family; HIV; Multi-level data; Social support; Coping responses

A growing movement in psychology is concerned with the influence of context on human functioning (Szapocznik and Kurtines, 1993). One of the most important units of social context is the family (Bronfenbrenner, 1986). The current study investigated the influence of HIV⁺ African American women who had recently given birth, on their family members. The study demonstrates a strategy to represent family systemic influences using individual level data. Multi-level modeling is used to integrate individual information on family members in a way that permits the identification of the effect of a recent mother's experience on her family members' psychological outcomes.

This study makes a theoretical contribution to stress process research by using a systemic approach to contextualize individual outcomes within the framework of other family members' experience. A system comprises parts that are interdependent or interrelated (Szapocznik and Kurtines, 1989). In human systems, interdependence is clear with persons being responsive to each other's behaviors. A major aspect of a human system is the interactive nature of behaviors and experiences of its members. That is, each individual's experience is quite different from what it would be if it were possible for the individual to live in isolation. The family is one type of system in which individual members of the system are clearly interdependent and interrelated.

The current study focused on HIV⁺ urban low-income African American women and their families because this population has extremely high rates of HIV infection, well beyond their

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proportion in the general population (CDC, 1999). Women at highest risk, like the women in the current study, are predominately of childbearing age (Miles, *et al.*, 1997), with a majority having children under the age of 18 (Kotchick *et al.*, 1997).

This study links conventional individual strategies across family members. To investigate the impact of the experience and function of HIV⁺ African American women on their family members, we relied on a theoretical model of the *stress process* (Pearlin, *et al.*, 1981; Lazarus and Folkman, 1984) to specify psychosocial adjustment. This model postulates that external events (life events, hassles), resources (social support, perceived control), and coping responses influence psychosocial outcomes of psychological distress and perceived adequacy (cf. Blaney *et al.*, 1997; Carels, *et al.*, 1998; Feaster *et al.*, 2000; Smith *et al.*, 2001 for examples in HIV infection).

External events such as *life stressors* and *hassles* are considered to be stress generators. Life stressors initiate the process and must be appraised as a challenge, threat, or potential harm (Lazarus and Folkman, 1984) to distinguish them from a normal consequence of social life and its various developmental stages (Pearlin *et al.*, 1981). For this study, we selected a population with a frequently occurring major life event, the birth of a child. Whereas the birth of a child is clearly not universally viewed as a threat or potential harm, most would agree that it is a challenge. Specifically, the infant care-giving role may involve significant stress, and need for adjustment for both mothers (Amodei, *et al.*, 1997; Hackl, *et al.*, 1997), and their family members (McKim, 1987; Stewart, 1990; Baxter and Kahn, 1996).

While poor urban African Americans are confronted with far too many major life events, they are also exposed to frequent minor external stressful events, usually referred to as "hassles" (Carroll, 1998a, 1998b). Hassles encompass the daily inconveniences and irritations of daily living (Nezu and Ronan, 1985; Pearlin, 1989). Poverty, and the lack of material resources it represents, is in itself a generator of hassles and stress (Ulbrich, *et al.*, 1989; McLeod and Kessler, 1990). The conditions of inner-city living also represent an important generator of hassles (Allen, 1996). Additional sources of hassles for this population are concerns about potentially deteriorating health and challenges to obtaining health-care access.

Resources such as *social support* and *perceived control* are considered to have positive effects on psychosocial outcomes. Resources are dispositions and beliefs (perceived control) or individuals and groups (social support) on which individuals can draw for help. Resources are expected to be negatively related to psychological distress, and positively related to perceived adequacy of coping (Pearlin *et al.*, 1981; Turner, 1981; Sarason, *et al.*, 1983; Cohen, *et al.*, 1986; Ross and Mirowsky, 1989; Mirowsky and Ross, 1990; Thoits, 1995).

Social support is a resource external to the individual that involves relationships the individual has with other individuals or groups. The family is a particularly important source of support in the African American community (Benin and Keith, 1995; Greenwood *et al.*, 1996b; Neighbors, 1997; Taylor *et al.*, 1997). Young recent mothers generally (Sacco and Macleod, 1990; Barratt *et al.*, 1996) and HIV-infected recent mothers specifically (Sharts-Hopco *et al.*, 1996) have shown an inverse relationship between the level of available social support and various indicators of psychological distress.

Perceived control is a resource internal to the individual that involves the individual's perception of the amount of influence she has over the events in her life. Feelings of control have generally been inversely related to indicators of psychological distress (Pearlin and Schooler, 1978; Pearlin *et al.*, 1981; Mirowsky and Ross, 1990; Miller, *et al.*, 1995; Ali and Avison, 1997). Perceived control has shown negative direct effects on professional HIV caregiver burnout with additional negative indirect effects working through lower likelihood of emotion focused and avoidant coping responses (Gueritault-Chalvin *et al.*, 2000). Both

HIV⁺ and HIV⁻ men with low senses of control have been shown to be more susceptible to psychopathology (Dew *et al.*, 1997), and in both HIV infected and cancer patients, feelings that others are in control has been correlated with psychological distress (Grassi *et al.*, 1997). For the HIV infected individual, perceived control over illness course has been associated with less depression (Griffin and Rabkin, 1998), and in HIV⁺ women, lower perceived control of health has been associated with anxiety (Cook, 1998) and death anxiety (Bluestone, 1996).

Reported coping responses are defined in terms of actions or cognitions, which the individual employs to address stressful events or problems. Groupings of coping responses vary in applied research, however, several investigations have employed three broad categorizations: active (or approach) coping, avoidant coping (disengagement, avoidance, denial), and support coping (seeking or utilizing support resources) (Goodkin *et al.*, 1992; Fleishman and Fogel, 1994; Feaster *et al.*, 2000). The choice of an appropriate coping response (Pearlin *et al.*, 1981; Lazarus and Folkman, 1984; Carver *et al.*, 1989) to stressors is believed to involve consideration of the level of resources available (Pearlin and Schooler, 1978; Folkman, 1984). Empirical investigations have shown that individuals with higher levels of perceived control are more likely to engage in problem-focused or active coping responses (Anderson, 1977; Strickland, 1978; Ross and Mirowsky, 1989; Ingledew *et al.*, 1997). Further, in some investigations perceived control has been related to the effectiveness of coping responses in ameliorating distress (Bowman and Stern, 1995; Hahn, 2000). After controlling for resources, different coping responses may be associated with divergent psychosocial outcomes. In HIV research, it has been suggested that avoidant coping may indeed be adaptive in some cases (Antoni *et al.*, 1990; Greenwood *et al.*, 1996a; Mulder *et al.*, 1999).

Clearly, the stress process model described above is intended to apply generally, and thus is expected to apply both to the HIV⁺ African American women as well as to their family members. In this study, we investigate the interrelationship between the stress process of the woman and the stress process of her family members. One example of related research on particular components of the stress process, has investigated the impact of caregivers and care-recipients on each other. For example, caregivers of progressive dementia patients have shown depressive symptoms that are related to the behavior of the patient (Redinbaugh *et al.*, 1995). Caregivers of pregnant adolescents showed more anger and negative attitudes toward the pregnancy as the depressive symptoms of the adolescent increased (Sacco and Macleod, 1990). The physical health of HIV⁻ caregivers of HIV⁺ patients was negatively related to the depression of the HIV⁺ patient (LeBlanc *et al.*, 1997). This research on caregiving is illustrative of a tradition of research that has tended to investigate the impact of distress of one person on the distress of the other (i.e., the relationship between the outcome of the stress process between individuals). Departing from this tradition, the current study, rather than investigating the relationship between psychosocial outcomes only, investigates relationships between a more detailed model of the HIV⁺ woman's stress process, and the psychosocial outcomes of the family members (see Fig. 1). In this fashion, it is possible to examine for example, the impact of external events (life events, hassles), resources (social support, perceived control), and coping responses (active, avoidant, and support) of the HIV⁺ woman *on* her family members.

The present study investigates the following hypothesis and corollaries:

Hypothesis 1 The recent mother's stress process as determined by external events (stressors, hassles), resources (social support, perceived control) and coping responses, will affect her family members' level of psychological distress and perceived adequacy.

Corollary 1 Families with HIV⁺ and HIV⁻ mothers will demonstrate different relationships among the variables in the stress process, with HIV infection in the mother exacerbating distress and reducing perceived adequacy of family members.

Corollary 2 This relationship is strongest early in the new child's life (time differences will be tested).

METHODS

Sample

Participants in this study included 168 families of urban African American mothers (birth within 6 months of study entry). Of the 168 recent mothers, 76 were HIV⁺ and 92 were HIV⁻. HIV serostatus was determined by their assignment by their physicians to special immunology (HIV⁺) or "regular" (HIV⁻) OB/GYN clinics. To be included in the study, the woman had to be of known HIV serostatus (either HIV⁺ or HIV⁻), over the age of 17, at least third generation African American (to minimize acculturation issues), non-institutionalized, not homeless and have family members who were willing to participate in a family assessment, as described below. Women with a psychiatric condition severe enough to cause hospitalization were also excluded because handling such severe conditions was beyond the scope of the study. HIV⁺ women with AIDS defining symptoms or CD4 cell count below 200 cells/mm³ were excluded.

Procedures

The women were recruited from a large, public hospital and affiliated specialty clinics in the Southeast United States. The study was fully explained, with the informed consent read to (and signed by) the woman. At the first assessment, all family members and extended kin who were deemed important for the woman's day-to-day functioning were enumerated. Later, within the next month and usually the following week, an assessor visited the home to explain the study, as well as read and obtain informed consent from all enumerated family members. All family members who the recent mother could arrange to be at this session and who signed informed consent were given an abbreviated psychosocial assessment. The mean percentage of family members assessed was 89.9% and more than 75% of families were completely assessed. Note that all measures reported by the recent mother were collected prior to the interview of her family members.

This procedure was repeated at the follow-up time point, a year later. Of the 169 families entered into the study, 144 families were re-interviewed at the subsequent assessment point (see Table IA). Due to missing data, one family was excluded at baseline and seven families at follow-up. There were no differences in observed data between the individuals in included and excluded families. In the analyses presented in this study, there are 305 family assessments (168 at time 1 and 137 at time 2), yielding 305 mother and 450 other family member assessments.

Measures

A very broad and encompassing definition of family was used (Pequegnat and Bray, 1997), where importance in daily life was the major criterion, rather than solely blood relations or living arrangements. The protocol to identify the family (Greenwood and Blake, 1993; Pequegnat *et al.*, 2001) involved asking the new mom: who lived in the home?, who performed household tasks such as shopping, paying bills, cooking and cleaning, childcare?, and with whom she had supportive and/or conflicting relationships? Based on the answers to these questions, any person with significant relationships to the new mom was eligible to participate in the family assessment, including any children more than 12 years of age.

Psychosocial Outcomes—Psychological Distress and Perceived Adequacy—

Psychosocial outcomes were measured by the Perceived Stress Scale (Cohen, *et al.*, 1983). Respondents utilized a 5-point Likert scale (0 = almost never to 5 very often) to indicate the

frequency with which they have perceived certain indices of distress in the last month. Two composite variables are created from this scale as determined by a confirmatory factor analysis (Feaster *et al.*, 1998). Psychological distress includes negatively worded items with a more affective character to them such as: 'In the last month how often have you been upset because of something that happened unexpectedly?', and 'In the last month, how often have you felt nervous and "stressed"?' Reliability for this scale was good with a Cronbach's [notdef] of 0.77. Perceived adequacy includes positively worded items reflecting the individual's having successfully managed stress. This scale includes items that reflect how well the woman or family member is doing with problems, such as: 'In the last month, how often have you dealt successfully with irritating life hassles?' and 'In the last month, how often have you felt that you were on top of things?' Cronbach's [notdef] for this scale is 0.72. This questionnaire was administered to the mother as well as all her family members. Convergent validity of the psychological distress measure was established in a separate study by the correlation of psychological distress with the Global Symptom Index of the Brief Symptom Inventory (Derogatis, 1993) of 0.60 ($n = 150$), the Hamilton Depression and Hamilton Anxiety scores (Hamilton, 1959, 1960) of 0.45 and 0.43 ($n = 114$), respectively. The correlation between psychological distress measure and the perceived adequacy measure was 0.09 at baseline and 0.27 at follow-up. Discriminant validity of the perceived adequacy and the coping measures is discussed below, in the Coping Responses section.

External Events

Negative life events Major negative life events were measured using a shortened version of the Life Event Scale (LES) (Sarason *et al.*, 1978). The LES items represent life changes frequently experienced by individuals in the general population. To reduce subject burden, the ten most often endorsed items by an earlier pilot sample of 47 seropositive African American women and 61 seronegative African American women (Hinkle, 1991) comprised the Modified Life Events Scale. These events were major change in sleeping habits, death of a close family member, major change in eating habits, death of close friend, outstanding personal achievement, pregnancy, change in work situation, gaining a new family member, change of residence, and a major change in church activities. The format of the LES calls for subjects to separately rate the desirability and impact of life events experienced. The count of negatively appraised life events is utilized as a measure of life stressors. Test—retest reliability data show ranges of 0.61—0.82 (Sarason *et al.*, 1978), for the original scale. This questionnaire is only asked of the mother.

Hassles Hassles were measured by the Revised Hassles Scale for African American Women, an adaptation by our group of the Hassles Scale developed by DeLongis *et al.* (1988). This instrument consists of 64 items that assess daily hassles occurring during the past 30 days. Total count of endorsed items was used as the measure of hassles. This questionnaire was administered to the mother as well as all her family members.

Resources—Social Support Available social support was measured using the Social Support Questionnaire-Short Form (SSQ6) (Sarason, *et al.*, 1987). For each of six questions (e.g. Whom can you really count on to be dependable when you need help?), respondents indicate each person available to provide support and the relationship of each person to them. This yields six indicators of social support. This count has been split into support from two sources — the sums of supports from immediate family (Cronbach's [notdef] = 0.81) and all other supports (Cronbach's [notdef] = 0.88). It should be noted that supports not from the immediate family might have included extended-family support. This questionnaire was asked of the mother only.

Perceived Control Controllability of life stressors was measured using the Perceived Control Questionnaire (Hinkle and Antoni, 1991). Perceived Control is a 12-item measure of the respondent's perceptions of personal control over certain life domains, such as health of the respondent and her children, source of money, and sexual behaviors. Answers were recorded on a 5-point Likert scale, ranging from "none" to "extreme or complete". The perceived control measure is a total sum of each of the items. Cronbach's [notdef] for the perceived control scale is 0.73. Convergent validity was established in a validation sample in which the correlation of the total perceived control and Pearlin's Mastery Scale (Pearlin *et al.*, 1981) was 0.62 ($n = 44$). This questionnaire was asked of the mother only.

Coping Responses—Coping responses were measured using a shortened version of the COPE (Carver *et al.*, 1989). This instrument is a 38-item questionnaire that consists of statements to which respondents rate, on a 4-point Likert scale, the extent to which they have engaged in the stated activity (e.g. I've been arguing with people around me, I've been looking for something good in what's happening). The shortened version of the COPE provides scales comparable to the original COPE for 11 of the 13 dimensions (restraint coping and suppression of competing activities are not represented). Convergent validity, assessed in a separate validation sample, is shown by correlations between corresponding scales in the original COPE scale and the shortened version used here varying from 0.51—0.83, with a mean of 0.70 ($n = 44$).

The instructions for this administration requested the respondent to respond with respect to how they were coping with the stress of the newborn and the newborn's effect on them. A confirmatory factor analysis on the current sample based on prior investigations with this and the parent scale (Blaney *et al.*, 1997; Feaster *et al.*, 1998) showed three factors to adequately characterize the majority of the coping behaviors: (1) *Active Coping* (Cronbach's [notdef] = 0.74) includes items that measure taking action, planning, positive reframing, and acceptance. (2) *Support Coping* (Cronbach's [notdef] = 0.80) includes indicators of seeking emotional support, seeking instrumental support, talking with friend or therapist, and seeking comfort from religion. (3) *Avoidant Coping* (Cronbach's [notdef] = 0.86) includes indicators of behavioral disengagement and self distraction, denial, self-blame, ventilation, stoicism, yearning for the past, suppression of feelings and thoughts, and arguing. It should be noted that the factors used in these analyses are the simple unit weighted sums of each of the coping responses in the category. Whereas these measures are related to the perceived adequacy of coping outcome, discriminant validity is demonstrated by the relatively low correlations of perceived adequacy with the Active, Support, and Avoidant Coping factors, $\rho = 0.13$, $\rho = 0.30$ and $\rho = 0.12$, respectively. This questionnaire was administered to the mother as well as all her family members.

Design and Statistical Model

Details of the models estimated are described in the Results section. Here we describe the mixed model method used to account for the multi-level aspect of the data. Mixed model methods (Littell *et al.*, 1996) contain both a fixed effect portion (i.e., the observed predictor (s), usually represented in the form of regression or ANOVA) and a specification of multiple random components that can account for the non-independence of nested observations. In the current study, the fixed effect portion of the model includes the observed variables of the mother's stress process and measures of the family members' hassles and coping as described in the results section. The random effects portion of the model contains two systematic components of error related to the nesting of the data. There are two types of nesting in this study: time is nested within individuals and individuals are nested within families. Hence, the error structure has, in addition to a residual error component, both a random intercept for families which accounts for the correlation of data within a family and a random intercept for

repeated measures within individuals over time. SAS Proc Mixed (Littell *et al.*, 1996) was used to estimate the mixed models. All tests of effects use Satterthwaite's approximation to determine degrees of freedom (Gaylor and Hopper, 1969; Tietjen, 1974).

RESULTS

Demographics

The women in the study did not differ by HIV status on demographic variables, as can be seen in Table IB. The women were young (mean age = 26.0, *SD* 6.1), low income (median family income = \$7040.), with most having other children in addition to the new infant (median number of children = 3). Only 11.9% of the women were employed and 81.5% were receiving some form of public assistance. The HIV⁺ women were relatively healthy with a mean CD4 cell count of 510 cells per cubic millimeter (*SD* = 271). Most of the women reported no HIV associated symptoms (85.1%) with some reporting minor (non-AIDS defining) symptoms (13.5%) and 1.4% reporting symptoms that are more serious.

There is heterogeneity in the relationships of family members to the recent mother in the current sample. Parents of the recent mother were the most represented (28.2%), with both significant others (21.6%) and siblings (21.8%) well represented. Extended family (9.3%), children of the recent mother (7.6%), friends (7.1%), and grandparents (4.4%) were also represented within the sample. Whereas there is potential for the results presented below to differ by the type of relationship, this is beyond the scope of the current investigation.

Mean Differences by HIV Status and Time

Table II contains the means of the predictors and outcomes by HIV and Time. In addition to the potential that the model differs over time, or by HIV status, the mean level of model predictors (regressors) may change over time or differ by HIV status, even when the effect (slope) of these variables on the dependent measure does not change or differ. It is necessary to examine any potential differences in the levels of predictors to gain a full understanding of the model and what the woman and family members are experiencing. This test used mixed model analysis of variance where the three factors are HIV status, time point, and the interaction term, HIV time point. Here there are both significant changes over time and differences by HIV status in the level of predictor variables (see Table II). There were no HIV Time interactions, however.

Significant Mean Differences by HIV Status — Related to Corollary 1—Four of the twelve model predictors showed significant differences in level by HIV serostatus. HIV seropositive mothers had significantly lower perceived control of stressors ($F(1, 180) = 12.48$, $p < 0.0005$), and reported higher scores on the Avoidant Coping factor ($F(1, 180) = 6.55$, $p < 0.02$). Family members of HIV seropositive mothers reported more hassles ($F(1, 111) = 3.96$, $p < 0.05$) and higher scores on the Support Coping factor ($F(1, 120) = 6.47$, $p < 0.02$).

Significant Mean Differences Over Time — Related to Corollary 2—Seven of the twelve model predictors showed significant differences in level over time. Regardless of HIV serostatus, both the mothers' major negative life stressors and psychological distress declined at the second time point ($F(1, 167) = 7.99$, $p < 0.006$ and $F(1, 152) = 4.91$, $p < 0.03$, respectively). Not surprisingly, mothers are reporting more stressors near the birth of the new child. In addition, the level of all three of the mother's measured coping factors *declined* significantly at the second time point (Active Coping: $F(1, 153) = 4.67$, $p < 0.04$; Support Coping: $F(1, 145) = 5.14$, $p < 0.03$; Avoidant Coping: $F(1, 148) = 4.17$, $p < 0.05$). That is, the mean empirical value of each of these three coping factors fell at the second time point, indicating that women did not endorse as many of the coping responses in each of the three composites, or endorsed

similar coping responses, but at a lower frequency. This pattern is consistent with the time near birth of the new child being a period of elevated stress requiring the use of more frequent and numerous coping responses. In contrast, for family members, the level of all three reported coping factors *increased* significantly at the second time point (Active Coping: $F(1, 255) = 11.67, p < 0.0007$; Support Coping: $F(1, 240) = 15.90, p < 0.0001$; Avoidant Coping: $F(1, 235) = 13.38, p < 0.0003$). Taken together, the results for the mother and family members show that as the family adjusts to the newborn, the mother decreases the number and/or frequency of her measured coping responses related to the newborn and family members increase the number and/or frequency of their measured coping responses. It is true, however, that we have only sampled from the potential pool of coping responses. It is possible that women are shifting from measured to unmeasured coping responses and that family members are shifting from unmeasured to measured coping responses as the child ages.

Testing of Hypothesis

Separate regression specifications were used to assess the effect of the components of the mother's stress process on other family members' psychological distress *and* perceived adequacy. Note that for all mothers there was at least one family member, but for some mothers there were more than one family member studied. The family members' report of hassles was included as a predictor to control for the level of (minor) stressors experienced by the particular family member. All specified components of the mother's stress process were used as predictors of the family members' outcomes. These predictors include: (1) the mother's report of psychosocial outcome, either psychological distress *or* perceived adequacy; (2) external events (a) negative life stressors and (b) hassles; (3) resources (a) social support from the immediate family, (b) social support from other sources, and (c) perceived control; and (4) coping responses (as measured by our coping factors) (a) Active, (b) Support, and (c) Avoidant. Type III sums of squares are used so that the presented coefficients represent the effect of the particular predictor holding constant the effects of all other variables included.

Mother's Stress Process as Predictor of Family Member's Psychosocial

Outcomes—Table III presents the regression results of the prediction of psychological distress and perceived adequacy of the mother's family members. *For psychological distress*, the full model was significant at below the 0.00001 level. Within this model, the family members' own reported hassles were associated with higher psychological distress ($t(351) = 12.97, p < 0.0001$). In addition, the mother's social support from sources other than the immediate family was associated with lower family members' psychological distress ($t(228) = 1.98, p < 0.05$).

Table III presents the full model for *perceived adequacy*, which was significant at the 0.0002 level. The mother's perceived adequacy was positively associated with the family members' perceived adequacy ($t(441) = 1.98, p < 0.05$). Here, family members' own hassles were not predictive of their own perceived adequacy. However, the mother's hassles were associated with lower family members' perceived adequacy ($t(439) = 3.31, p < 0.001$). Social support available to the mother from her immediate family was associated with higher family members' perceived adequacy ($t(415) = 2.53, p < 0.02$). Higher perceived control of the mother was associated with lower perceived adequacy of family members ($t(433) = 3.38, p < 0.0008$).

Adding Family Members' Coping Responses—Having determined that the stress process of the mother predicted the distress and adequacy levels of family members, we were interested in determining if the family members' coping responses could mediate the ultimate impact of mothers' stress process on their distress and adequacy outcomes. To test for this mediation, we added the family members' coping factors to the model estimated above. The results presented in the last two columns of Table III reveal that the addition of the coping

factors of the other family members significantly improved model fit for both psychological distress ($\chi^2(3, N = 450) = 65.26, p < 0.00001$) and perceived adequacy ($\chi^2(3, N = 450) p = 55.86, < 0.00001$).

Distress Family members' Support Coping ($t(349) = 2.93, p < 0.004$) and Avoidant Coping ($t(318) = 7.54, p < 0.0001$) were associated with higher, whereas Active Coping ($t(349) = 2.93, p < 0.004$) was associated with lower psychological distress. Whereas family members' hassles remained a significant predictor, the effect of the mother's social support from sources outside the family was no longer significant ($t(209) = 1.57, p < 0.12$). This indicates that the effect of the mother's social support from sources outside the family was partially mediated by the family members' choice of coping responses. When the family members' coping responses (as measured by the three coping factors) are added to the model, the coefficient on social support from sources outside the family increases from 0.119 to 0.092 — a shrinkage of this (negative) effect of 22.6%.

Adequacy The last column of Table III presents the results for perceived adequacy. Family members' Active ($t(449) = 4.62, p < 0.0001$) and Support Coping ($t(441) = 3.15, p < 0.002$) were associated with more, whereas Avoidant Coping ($t(430) = 3.37, p < 0.0008$) was associated with less perceived adequacy. The effect of the mother's perceived adequacy is now only a weak effect ($t(438) = 1.94, p < 0.054$). All other previous independent effects of the mother's stress process — hassles, social support from immediate family, and perceived control — maintain statistical significance. Whereas prior effects remain significant with the addition of family members' coping, nevertheless, there is a shrinkage of the negative effects of mother's hassles (from 0.095 to 0.076) and mother's perceived control (from 0.169 to 0.124), of 20% and 27%, respectively, thereby suggesting partial mediation.

Corollaries 1 and 2 — Method for Testing for Model Differences by HIV and Time

—Corollaries 1 and 2 state that the influence of the mother's stress process on family members' outcomes of distress and adequacy are exacerbated by HIV seropositivity and early in the child's life, respectively. Because family members' coping influenced their own ultimate levels of distress and adequacy beyond the influence of the mother's stress process, we used the fuller model (including family members' own coping) presented in Table III to test Corollaries 1 and 2. Separate analyses were conducted for distress and perceived adequacy. However, to reduce the number of tests, a single model was used to ascertain the effect of HIV status of the mother, time point, and their interaction. Each of these models then, tested for effects of HIV (vs.) Time on the relationship between the mother's stress process and the family members' outcome. There were no significant differences for psychological distress ($\chi^2(42, N = 450) = 48.02, p < 0.25$). However there were significant differences for perceived adequacy ($\chi^2(42, N = 450) = 69.06, p < 0.006$).

To present the differences in the perceived adequacy specification in a parsimonious fashion, an additional model was estimated with all individual interaction effects (either HIV Predictor, Time Predictor, or HIV Time Predictor) with a p -value less than 0.10 were included, as well as all main effects reported in the last column of Table III. Three sets of terms had $p < 0.10$: A. effects of HIV, but not time, hence only the HIV term was included in the final equation; B. effects of HIV and Time, hence the four cells representing HIV Time were included in the final equation — because coefficients for HIV status shift by time; and, C. effect of Time, but not HIV, hence only the Time term was included in the final equation. These effects are organized accordingly in Table IV.

Corollary 1 — significant model differences by HIV status Because the purpose of this study was to involve as many family members as possible who had functional relationships with the target participant, the recent mother, family members included in this study might or might not

have known about the woman's HIV status. Because data on disclosure for each family member was not available, we were not able to analyze by knowledge of HIV serostatus. Consequently, these findings reflect the functioning of families in which the recent mother is HIV⁺ or HIV⁻, regardless of whether or not her family members included in this study knew of the woman's serostatus.

In support of Corollary 1, family members' perceived adequacy was influenced differentially for families of HIV⁺ and HIV⁻ mothers in four variables: (1) Mother's hassles; (2) Mother's Avoidant Coping, (3) Family members' hassles; and, (4) Family members' Avoidant Coping. These statistics are reported in Parts A and B of Table IV.

(1) *Mother's hassles*. In the first row of Table IV, the negative effect of the mother's hassles on her family's perceived adequacy is strongest in the families with an HIV mother ($F(1, 437) = 7.28, p < 0.0008$). (2) *Mother's Avoidant Coping*. In the second row, the mother's Avoidant Coping was associated with lower family members' perceived adequacy for families of HIV⁺ mothers, but not related for families of HIV⁻ mothers ($F(1, 442) = 3.37, p < 0.04$). Hence, Avoidant Coping on the part of HIV⁺ mothers did have a deleterious impact on her family members' perceived adequacy, but not so for HIV⁻ mothers and their families. (3) *Family members' hassles*. In the third row (Part B), family members' own hassles were associated with poorer perceived adequacy in family members of HIV⁺ mothers, than in family members of HIV⁻ mothers ($F(1, 418) = 4.00, p < 0.05$). Thus, family members of HIV⁺ mothers were more sensitized or reactive to their own hassles than were family members of HIV⁻ mothers. (4) *Family members' Avoidant Coping*. In the fourth row, family members' Avoidant Coping was more deleterious on their own perceived adequacy for family members of HIV⁻ mothers, as compared to family members of HIV⁺ mothers ($F(1, 442) = 17.97, p < 0.0001$). Thus, combining 2 and 4 above, it appears that family members' adequacy is affected by the Avoidant Coping of HIV⁺ mothers, and by their own Avoidant Coping when the mothers are HIV⁻.

Corollary 2— significant model differences by time Important aspects of families' developmental adjustment can be identified when families are measured within six months after the birth of the child and again a year later. In particular, family members' perceived adequacy was affected differentially by the mother's stress process and their own experience of hassles and coping at these two times. In support of Corollary 2, there was significantly different impact on family members' adequacy at within six months of the birth and one year later for the following five variables: (1) Mother's social support from immediate family; (2) Mother's Active Coping factor; (3) Family members' Active Coping factor; (4) Family members' hassles; and (5) Family members' Avoidant Coping factor.

(1) *Mother's social support from immediate family*. In the fifth row of Table IV, mother's report of social support from her immediate family was associated with higher family members' perceived adequacy at Time 1, proximal to the birth, but not at Time 2 ($F(1, 437) = 5.60, p < 0.004$). With this result more than with others, a possible circularity of causality is particularly relevant. It is certainly possible that family members with greater perceived adequacy provided greater social support. (2) *Mother's Active Coping*. In the sixth row, mother's Active Coping is associated with higher perceived adequacy at Time 1 than at Time 2 ($F(1, 425) = 4.01, p < 0.02$). (3) *Family members' Active Coping*. In the seventh row, family members' own Active Coping is associated with higher perceived adequacy at Time 2 than at Time 1 ($F(1, 439) = 8.90, p < 0.0002$). Items 2 and 3 taken together suggest that the mother's Active Coping appears to be an important predictor of higher family members' perceived adequacy within six months of the birth, while the family members' own Active Coping is important at one year later. (4) *Family members' hassles*. In the third row of Table IV, the effect of family members' own hassles on their perceived adequacy also showed significant differences by Time (as well as HIV status, reported above). The effect of family members'

hassles appears attenuated near the birth (See Part B, Table IV: $F(1, 364) = 5.53, p < 0.02$); i.e. the effect of hassles on perceived adequacy is less negative at Time 1 than Time 2, regardless of HIV status. As reported above, having an HIV⁺ mother in the household heightens the family members' response to hassles. While these two effects (HIV and Time differences) are quite strong, they work in such a way that family members' hassles are only significantly negatively related to perceived adequacy for family members' of an HIV⁺ mother at over a year post birth. (5) *Family members' Avoidant Coping*. In the fourth row of Table IV, the effect of family members' Avoidant Coping is also more deleterious on their own perceived adequacy one year later than within the first six months after birth (See Part B, Table IV: $F(1, 388) = 4.99, p < 0.03$). This suggests that the birth of the child attenuates the effect of the family members' Avoidant Coping on their perceived adequacy, i.e. it lessens the negative effect of Avoidant Coping on perceived adequacy. This effect works with the significant HIV difference in the effect of family members' Avoidant Coping as described above. While the family members' Avoidant Coping is significantly deleterious at times 1 and 2 for family members of an HIV mother, at the time of the birth of a child from an HIV⁺ mother, Avoidant Coping has a beneficial effect. Hence, coping responses such as denial and venting might be helpful at such times in preserving the individual's sense of perceived adequacy. Perhaps, as it has been often argued (Cohen, 1987, 1990), in the face of uncontrollable stressors, denial, avoidance, suppressing feelings and thoughts, among others, might have a beneficial effect, at least in the short run (Suls and Fletcher, 1985).

DISCUSSION

A major contribution of this study is the presentation of a method to contextualize individual outcomes within the framework of others' experiences. Demonstrating the impact of one members' experience on another family member is consistent with a contextual perspective that suggests that individual behavior and experience needs to be understood in the conditions in which it occurs. The contextual aspects of this investigation also included examining how these systemic processes (1) differ for families with an HIV⁺ mother, and (2) change with infant/family development over time. Research into psychological relationships can frequently yield quite disparate results. One source of divergence in results may be a failure to jointly consider the effects of salient contextual factors of family interdependence, family members' condition (i.e., HIV serostatus) and family developmental moment (Szapocznik and Kurtines, 1993; Feaster *et al.*, 2000).

Given the level of contextual complexity of this study, there is considerable detail to the specifics of the findings. At a very general level, there is substantial evidence for the hypothesis that a recent mother's stress process — experience of external events, resources and coping responses—affects perceived adequacy of her immediate family members. The evidence also supports the corollary hypotheses: (1) that this relationship is exacerbated by HIV infection and (2) is strongest early in the infant's life. The effect of HIV infection, however, is not uniformly exacerbating across predictor variables. In contrast, the evidence is modest in support for the hypothesis and nonexistent for the two corollaries with regard to psychological distress.

Hypothesis — Mother's Stress Process Affects Family Members' Psychosocial Outcomes

Psychological Distress—For psychological distress, the amount of the mother's social support from sources other than the immediate family is associated with lower psychological distress of family members. Because the effects of outside social support were partially mediated by the family members' choice of coping responses, it appears that family members take this social support into account when they choose coping responses to the new child. This is consistent with a view of family members as potential caregivers for the new infant. Social support from outside the family would be a source of respite for anyone caring for the child

(Andrews *et al.*, 1993; Amodei *et al.*, 1997). This relationship is not significantly different by HIV status suggesting that HIV does not compound the caregiving role of these family members. Thus, worry about the health status of the new infant (Boyd-Franklin *et al.*, 1995; Miles *et al.*, 1997) and the potential dual burden of caregiving for the infant and the HIV-infected mother do not appear to affect this relationship. This may be because this sample is relatively early in the course of HIV infection and relatively healthy with mean CD4 cell count of 510 cells/mm³. Thus, the women are not particularly in need of special care with respect to HIV infection.

Perceived Adequacy—There are multiple relationships between the mother's stress process and her family members' feelings of perceived adequacy. The new mother's perceived adequacy was positively and perceived control negatively associated with perceived adequacy of family members, which support the hypothesis. The relationship between mothers' and family members' perceived adequacy, while potentially causal, may also be a result of a familial tendency to either have or report similar levels of perceived adequacy. Regardless, other effects of the mother's stress process on family perceived adequacy were maintained while controlling for this either causal or familial link, which strengthens these other findings.

Concerning the mother's perceived control negatively affecting the family members' perceived adequacy, if mothers with more difficulties near the childbirth report lower perceived control, as might be expected, then there is a greater need for aid from family members. This greater need might increase the family members' feelings of adequacy by validating their importance for the new mother. This would work in concert with social support, which is discussed below.

Corollary 1 — HIV Differences in the Model — Perceived Adequacy—*Exacerbating effects of HIV* HIV infection heightens family members' responsiveness to some aspects of the mother's stress process. Avoidant Coping of the mother is negatively related to family members' perceived adequacy for family members' of HIV⁺ mothers, but not for family members' of HIV⁻ mothers. HIV⁺ mothers also report higher levels of Avoidant Coping than do HIV⁻ mothers. Thus, family members of HIV⁺ mothers experience both higher levels of the mother's Avoidant Coping, and respond more negatively to this Avoidant Coping. Thus, Avoidant Coping of the mother results in a very strong negative effect on the perceived adequacy of family members of HIV⁺ mothers.

HIV also affects the family members directly. Family members of HIV⁺ mothers report higher levels of hassles. Not only are hassles elevated for family members of HIV⁺ mothers, but their hassles are also negatively related to their perceived adequacy; whereas, especially near the birth, own hassles are unrelated to perceived adequacy of family members of HIV⁻ mothers. Thus, while a recent birth seems to "numb" family members' of both HIV⁺ and HIV⁻ mothers to the effect of their own reported hassles on perceived adequacy, HIV infection of the mother both increases the level of family members' hassles and increases the family members' sensitivity (with respect to perceived adequacy) to hassles. Hence, whereas family members of HIV⁺ mothers are not at increased risk for psychological distress, they are at risk for lower perceived adequacy.

Attenuating effects of HIV Not all results supported the corollary hypothesis of exacerbated relationships for families with HIV⁺ mothers. The negative effect of the mother's hassles on family members' perceived adequacy is attenuated for families of HIV⁺ mothers, as opposed to the heightened relationship with their own hassles. In addition, while not significant, both mother's hassles and major negative life stress are lower in the HIV⁺ mothers, so this attenuation is not a result of increased level of hassles (c.f. Blaney *et al.*, 1997 for an example of the effect of stress decreasing at higher levels of stress). A final effect of HIV on the relationship between mother's functioning and the family members' functioning which does not follow the

hypothesis is perceived control. Whereas the mother's perceived control is negatively related to family members' perceived adequacy for both HIV⁻ and HIV⁺ mothers, perceived control is significantly lower in HIV⁺ mothers. The net effect would be higher perceived adequacy of family members' of HIV⁺ mothers.

Corollary 2 — Model Differences by Time from the Birth

Stronger effects near birth Social support from the immediate family to the mother was associated with higher levels of perceived adequacy of family members near the birth, but not a year later, thus supporting Corollary 2. This is consistent with the family members' gaining a sense of adequacy from their support of the new mother and infant, but also might reflect family members with higher levels of adequacy having greater ability and willingness to give more support to the mother. Thus, there may be systemic circularity in this relationship. A year later, after adjustments have taken place, there may be less pull from the woman for this social support, so that "more adequate" family members might direct their support elsewhere (which would explain the decline in the coefficient at Time 2, Table IV, Row 5). However, because there is no mean change in the level of social support from immediate family across time (see Table II), this decrease in support from "more adequate" family members is of necessity compensated by increases in support from "less adequate" members. It should be noted that the relationships between family support and perceived adequacy are controlling for the relationship of support from others and perceived adequacy, and thus support from others is not causing these observed relationships.

The mother's Active Coping is also positively related to her family members' perceived adequacy near to the birth, but not one year later. One potential mechanism for this relationship is Active Coping of the mother lowering the burden on family members, leading to higher feelings of adequacy. While it may be tempting to posit the potential for systemic circularity — more efficacious families providing an atmosphere or infrastructure, which allows the mother to effectively actively cope — other relationships preclude this line of reasoning. Most important, the effect of family members' own Active Coping is attenuated and not significant near the birth, but strongly positive a year later. Although possible, it is difficult to imagine that family members' perceived adequacy would provide an environment conducive to effective Active Coping for the new mother, but not have a similar effect on themselves.

Taken together, these results suggest that near to the birth, Active Coping of the mother is more important for the perceived adequacy of her family members' than the family members' own level of Active Coping. Across the 12 months between Time 1 and 2, the mother's mean levels of the three measured coping factors are falling and the family members' are rising, including the Active Coping factor. At the same time, the regression coefficients relating the family members' Active Coping factor to perceived adequacy are getting larger (i.e. Active Coping is becoming more positively related with perceived adequacy). Thus, as the family members increase their Active Coping over time in response to the new infant, the effectiveness of their Active Coping is also increasing and both of these increases in level and strength of relationship between the variables are increasing their perceived adequacy. Likewise, as the mother's Active Coping decreases, so does the effectiveness of her Active Coping in "creating" feelings of adequacy in her family members; thus the importance of the mother's Active Coping to family members' perceived adequacy falls over time, after the birth. These results could be interpreted to suggest that as the family members gain experience with the child and become comfortable with the infant, their own Active Coping helps their feelings of adequacy, and they are less reliant on the Active Coping of the mother.

Attenuated effects near birth Not all results supported the corollary hypotheses of strongest relationships near to birth. The effect of family members' Avoidant Coping on their perceived adequacy is attenuated or less negative near the birth for families of both HIV⁺ and HIV⁻

mothers. In addition, as discussed above, the negative relationship of family members' own Avoidant Coping on their perceived adequacy is also attenuated or less negative in HIV⁺ families. The net effect is the Avoidant Coping of family members' of HIV⁺ mothers is actually significantly positively related to perceived adequacy near the birth.

The Avoidant Coping factor included items measuring denial, behavioral disengagement and self distraction, suppression of feelings and thoughts, yearning for the past, as well as self-blame, ventilation, stoicism, and arguing. Whereas these coping responses have been primarily associated with negative psychological outcomes for the individual in HIV infection (Kurdek and Siesky, 1990; Remien *et al.*, 1992; Commerford *et al.*, 1994; Fukunishi *et al.*, 1996; Rosengard and Folkman, 1997; Blaney *et al.*, 1997; Feaster *et al.*, 2000; Hart *et al.*, 2000), there have been several cases where avoidant coping responses have been found to be adaptive in HIV infection. Antoni, *et al.* (1990) found denial positively related to phytohemagglutinin values (a measure of CD4 cell function). Greenwood and colleagues (1996a) found that denial decreased distress in the face of declining CD4 count. Most recently Mulder *et al.* (1999) found that avoidant coping was related to lower rates of decline in CD4 cell count, lower likelihood of developing a syncytium-inducing HIV variant, and lower likelihood of developing immunologically defined AIDS (CD4 cells dropping below 200) over a seven-year period. In the current investigation, we have found a positive relationship between Avoidant Coping of family members of HIV⁺ mothers and the family members' feeling of adequacy. It remains to be seen if this relationship would hold in a sample of more progressed HIV⁺ women, where health issues might be more salient to family members. It should be noted that family members' of HIV⁺ mothers were negatively affected (with respect to perceived adequacy) by the mother's Avoidant Coping.

Limitations, Summary and Conclusion

This study was initially designed to compare HIV⁺ and HIV⁻ mothers around a strong common potential stressor (a new infant in the home). This investigation has shown that there are direct effects of the mother's psychosocial functioning on the functioning of other family members in the face of the introduction of a new infant to the household. The study could have benefited from more direct measures of childcare burden by various family members, thus allowing a measurement of the amount of stress directly related to childcare. Additionally, the lack of a non-infant control group limits the ability to confirm that the observed relationships are due to the stress of the infant alone. Knowledge of which family members knew of the recent mother's HIV status may have given a sharper picture of the effect of HIV status. Nevertheless, the results of this investigation are consistent with the view of the introduction of a new infant into the family as a potential source of stress, requiring adjustments to new roles (McKim, 1987; Stewart, 1990), and adjustments by all family members (in coping responses) over time.

The mother's social support was important for both family members' psychological distress and perceived adequacy. However, different components were important: support from the immediate family was associated with higher feelings of adequacy, whereas support from outside of the immediate family was associated with lower psychological distress of family members. This points to the utility of looking at social support from this more dis-aggregated perspective, especially when looking at effects on the family. The family members' role as provider of social support to the mother may involve provision of respite to the mother by caregiving to the new infant. This new role has been a cause of stress for family members (Sprunger *et al.*, 1985), particularly in low-income families (Baxter *et al.*, 1996). Here, there is no evidence that the family members' provision of social support is associated with distress, but there is evidence that social support to the mother from outside the family has benefits in terms of lower distress to family members. Belonging to a family in which the mother experiences higher social support from her family members increases the sense of adequacy

of individual family members. Rather than a source of stress and distress, the family's provision of social support to the mother is associated with higher feelings of adequacy of the individual family members. This is perhaps an important statement of the beneficial psychological impact to a family member of having a new baby in the family.

There is potential systemic circularity in the causal assumptions of the model estimated, as can most clearly be seen in the relationship between social support from immediate family and family perceived adequacy. As discussed above, it may be that more adequate family members are more able and do provide more support. But more generally, many of the relationships may be going from family members psychosocial functioning to the mother's psychosocial functioning. Whereas determination of causal direction requires longitudinal data (and in most cases more than two time points of data), we did test a post-hoc model to address this issue. *A model assuming that causality was from the family to the mother showed no significant relationships.* The independent variables in this model were family averages (less the mother) and outcomes were the mother's distress and adequacy. This, of course, is not the only way that relationships flowing from family members to the mother might be modeled. The potential for some amount of bi-directionality still remains.

This study has shown that the stress process of low-income, inner-city African American recent mothers has direct effects on their family members and that these effects are different depending both on the HIV status of the mother and time since the birth of a new child. Beyond this, *the study has shown that incorporating the systemic relationship between individuals may be of great benefit in research into the effects of the stress process.* This suggests that research on the relationship between stress and disease processes, which has tended to rely only on individual information would benefit from a contextualist family perspective. Future work should look very closely at reciprocal relationships within the family and other interacting groups and how these reciprocal relationships affect the mental and physical health of those involved.

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FIGURE 1.
Model of the effects of recent mother's stress process on family members, psychosocial, functioning.

TABLE IA

Data layout

	<i>Total</i>	<i>HIV⁻</i>	<i>HIV⁺</i>
Time 1:			
Mothers	168	92	76
Other family members	239	134	105
Time 2:			
Mothers	137	77	60
Other family members	211	127	84
Total:			
Mothers $\times$ Times:	305	168	137
Other family members $\times$ Times	450	262	188

TABLE IB

Demographic characteristics of the sample

	<i>Total</i>	<i>HIV⁻</i>	<i>HIV⁺</i>
Number of families	168	92	76
Age of new mom	26.0(6.1)	25.5(6.5)	26.5(5.6)
Modal level of education of new mom	High School Diploma	High School Diploma	High School Diploma
Median family income	\$7040. (\$3636–\$13,000)	\$7000. (\$4098–\$13,000)	\$7141 (\$3600–\$12,636)
Median number of people in household	5(4–7)	5(4–7)	5(3–7)
Median number of children of the new mom	3 (1–4)	2(1–4)	3(2–4)
% of new moms employed	11.9%	13.0%	10.5%
% receiving public assistance	81.5%	78.3%	85.6%

For age (*SD*), for all other variables (interquartile range).

TABLE II
 Predictor variables across time and serostatus-ANOVA results

	<i>HIV Seronegative</i>		<i>HIV Seropositive</i>		<i>Tests of Differences F-statistic_(d.f.) p-value</i>		
	<i>Time 1</i>	<i>Time 2</i>	<i>Time 1</i>	<i>Time 2</i>	<i>HIV</i>	<i>Time</i>	<i>Hiv × Time</i>
<i>New Mom's Reported Level of:</i>							
Psychological distress	12.81 (0.56)	12.42 (0.58)	13.91 (0.62)	12.27 (0.67)	0.42 ₍₁₈₁₎ 0.5153	4.91 ₍₁₅₂₎ 0.0281	1.84 ₍₁₅₂₎ 0.1769
Perceived adequacy	20.76 (0.57)	21.06 (0.60)	21.75 (0.64)	21.57 (0.69)	1.00 ₍₁₈₅₎ 0.3175	0.02 ₍₁₅₈₎ 0.8981	0.24 ₍₁₅₈₎ 0.6221
Major negative life stressors	2.10 (0.15)	1.71 (0.17)	1.84 (0.17)	1.38 (0.19)	2.52 ₍₁₈₂₎ 0.1143	7.99 ₍₁₆₇₎ 0.0053	0.05 ₍₁₆₇₎ 0.8246
Count of hassles	22.26 (1.11)	21.23 (1.19)	21.53 (1.23)	19.79 (1.39)	0.55 ₍₁₈₀₎ 0.4599	2.31 ₍₁₄₇₎ 0.1311	0.15 ₍₁₄₇₎ 0.7016
Social support not immediate family	5.44 (0.47)	5.63 (0.50)	5.58 (0.51)	5.19 (0.56)	0.06 ₍₁₈₄₎ 0.8096	0.06 ₍₁₅₄₎ 0.8131	0.55 ₍₁₅₄₎ 0.4600
Social support from immediate family	5.30 (0.48)	4.70 (0.52)	4.88 (0.54)	5.30 (0.59)	0.02 ₍₁₈₈₎ 0.8928	0.06 ₍₁₅₃₎ 0.8089	1.78 ₍₁₅₃₎ 0.1840
Perceived control	41.10 (0.63)	41.84 (0.68)	38.01 (0.70)	39.23 (0.77)	12.48 ₍₁₈₀₎ 0.0005	3.01 ₍₁₅₅₎ 0.0849	0.17 ₍₁₅₅₎ 0.6777
Active coping	25.36 (0.51)	24.33 (0.55)	25.19 (0.56)	24.21 (0.62)	0.04 ₍₁₇₇₎ 0.8335	4.67 ₍₁₅₃₎ 0.0323	0.00 ₍₁₅₃₎ 0.9558
Support coping	20.97 (0.56)	20.33 (0.60)	22.55 (0.62)	21.13 (0.67)	2.52 ₍₁₇₉₎ 0.1142	5.14 ₍₁₄₅₎ 0.0249	0.71 ₍₁₄₅₎ 0.4005
Avoidant coping	29.50 (0.95)	27.87 (1.02)	32.69 (1.05)	31.08 (1.14)	6.55 ₍₁₈₀₎ 0.0113	4.17 ₍₁₄₈₎ 0.0428	0.00 ₍₁₄₈₎ 0.9869
<i>Family Members' Reported Level of:</i>							
Psychological distress	10.53 (0.57)	11.04 (0.57)	10.61 (0.63)	11.80 (0.68)	0.34 ₍₁₁₈₎ 0.5625	3.09 ₍₂₁₇₎ 0.0801	0.52 ₍₂₁₇₎ 0.4735
Perceived adequacy	19.54 (0.56)	20.48 (0.57)	19.91 (0.62)	20.21 (0.69)	0.01 ₍₁₂₆₎ 0.9424	1.16 ₍₃₀₃₎ 0.2829	0.30 ₍₃₀₃₎ 0.5848
Count of hassles	19.39 (1.19)	19.68 (1.19)	21.56 (1.32)	23.73 (1.42)	3.96 ₍₁₁₁₎ 0.0490	1.81 ₍₁₈₇₎ 0.1805	1.05 ₍₁₈₇₎ 0.3061
Active coping	20.28 (0.57)	21.47 (0.58)	20.57 (0.63)	23.09 (0.70)	1.92 ₍₁₁₈₎ 0.1684	11.67 ₍₂₅₅₎ 0.0007	1.49 ₍₂₅₅₎ 0.2235
Support coping	15.47 (0.48)	17.09 (0.48)	16.76 (0.54)	18.77 (0.59)	6.47 ₍₁₂₀₎ 0.0122	15.90 ₍₂₄₀₎ 0.0001	0.19 ₍₂₄₀₎ 0.6649
Avoidant coping	23.12 (0.83)	25.57 (0.84)	22.96 (0.92)	25.68 (1.00)	0.00 ₍₁₁₁₎ 0.9811	13.38 ₍₂₃₅₎ 0.0003	0.03 ₍₂₃₅₎ 0.8523

Significant differences are bolded in the appropriate column.

TABLE III

Predicting family member's psychological distress and perceived adequacy as a function of mother's stress process

	<i>Test of Hypothesis</i>		<i>Adding Family Members' Coping Responses</i>	
	<i>Distress</i>	<i>Adequacy</i>	<i>Distress</i>	<i>Adequacy</i>
<i>Family Members' Own Reported Level of:</i>				
Count of hassles	0.253 (0.020) ****	-0.033 (0.022)	0.195 (0.020) ****	-0.040 ^a (0.023) ****
Active coping	—	—	-0.131 (0.045) **	0.249 (0.054) ****
Support coping	—	—	0.109 (0.051) *	0.196 (0.062) **
Avoidant coping	—	—	0.230 (0.030) ****	-0.121 (0.036) ***
<i>Mom's Reported Level of:</i>				
Psychological distress	0.074 (0.060)	—	0.051 (0.058)	—
Perceived adequacy	—	0.113 (0.057) *	—	0.105 ^a (0.054)
Major negative Life stressors	-0.113 (0.173)	0.144 (0.194)	-0.080 (0.168)	0.298 (0.185) **
Count of hassles	0.006 (0.026)	-0.095 (0.029) ***	0.014 (0.025)	-0.076 (0.027) **
Social support from immediate family	-0.044 (0.054)	0.151 (0.059) *	-0.043 (0.053)	0.142 (0.056) *
Social support from other sources	-0.119 (0.060) *	0.068 (0.068)	-0.092 (0.058)	0.041 (0.064)
Perceived control	0.007 (0.044)	-0.169 (0.050) ***	0.006 (0.042)	-0.124 (0.047) **
Active coping	-0.055 (0.058)	0.026 (0.068)	-0.063 (0.056)	0.046 (0.064)
Support coping	0.008 (0.053)	0.072 (0.060)	0.016 (0.051)	0.014 (0.057)
Avoidant coping	0.042 (0.034)	-0.027 (0.035)	0.028 (0.033)	-0.038 (0.034)
Intercept	5.327 (2.408)	24.363 (2.752)	2.226 (2.465)	17.836 (2.777)
Log likelihood	-1363.45	-1443.42	-1330.82	-1415.49
Constrained likelihood ^I	-1442.36	-1460.23	-1363.45	-1443.42
χ^2	157.82	33.62	65.26	55.86
df	10	10	3	3
p-value	< 0.000001	0.0002	< 0.00001	< 0.00001

(standard error)

^a 0.10 ≥ p > 0.05;* 0.05 ≥ p > 0.01;** 0.01 ≥ p > 0.001;*** 0.001 ≥ p > 0.0001;**** 0.001 ≥ p .^I The constrained model for the initial specification is one where only the overall mean is estimated. For later specifications, it is the prior specification.

TABLE IV

Interaction effects with $p < 0.10$ in test of model for perceived adequacy

	Tests of Differences F -statistic _(df) p -value	
	HIV ⁻	HIV ⁺
A. HIV Effect only:		
1 <i>Mother's</i> hassles	-0.130 (0.035) ***	-0.017 (0.040)
2 <i>Mother's</i> avoidant coping	0.034 (0.042)	-0.122 * (0.049)
B. HIV and Time effect:		
3 <i>Family member's</i> hassles		
4 <i>Family member's</i> avoidant coping		
C. Time effect only		
5 <i>Mother's</i> social support from immediate family		
6 <i>Mother's</i> active coping		
7 <i>Family Member's</i> active coping		

Significant differences bolded in the appropriate column, starred coefficients represent that the test against zero (i.e. no effect) for that HIV status at that time.

- * $0.05 \geq p > 0.01$;
- ** $0.01 \geq p > 0.001$;
- *** $0.001 \geq p > 0.0001$;
- **** $0.001 \geq p$.