Published in final edited form as:

Vulnerable Child Youth Stud. 2012 December 1; 7(4): 357–370. doi:10.1080/17450128.2012.708461.

Effects of Maternal HIV on Children's Psychosocial Adjustment with Peers and with Their Mother

Debra A. Murphy, Ph.D.¹, William D. Marelich, Ph.D.², H. Isabella Lanza, Ph.D.³, and Diane M. Herbeck, M.A.¹

¹Health Risk Reduction Projects, Integrated Substance Abuse Programs, University of California Los Angeles

²Department of Psychology, California State University, Fullerton

³Integrated Substance Abuse Programs, University of California Los Angeles

Abstract

A longitudinal assessment was undertaken of young adolescents' psychosocial outcomes affected by maternal HIV/AIDS, focusing on both parent-child psychosocial ties and peer relationships. Data were taken from the Parents and Children Coping Together study (PACT), a 15-year study assessing mothers with HIV/AIDS and their well children every 6 months. Families ($N = 118$) who participated in PACT II and PACT III are included in the current analyses, who were assessed every 6 months for 36 months in PACT II, and every 6 months for 18 months in PACT III (providing 11 time points of data across 8 years). Growth curve modeling was applied to assess the associations of maternal health on adolescent psychosocial outcomes. In terms of their relationship with their mother living with HIV (MLH), adolescent psychosocial functioning was negatively impacted by maternal illness, specifically viral load count and vitality levels, while several indicators of increased maternal illness (including viral load, vitality, illness symptoms, health-related anxiety) predicted less attachment with peers. In addition, MLH increased illness was associated with more adolescent autonomy.

Research dating back three decades indicates that the study of children and adolescents' psychosocial functioning is important as a measure of impairment in everyday life and in the prediction of later problems (Garmezy, 1981; Sroufe & Rutter, 1984). Studies have demonstrated the importance of a good parent-child relationship for psychosocial functioning (Radke-Yarrow & Brown, 1993); early work by Baumrind (1978) suggests that parents who are supportive but have firm parental control are more likely to have socially competent children. A good parent-child relationship is not just vital to children's psychosocial adjustment with parents, but also carries over to relationships with peers, particularly in the transition from childhood to adolescence. A positive parent-child relationship provides a supportive base from which early and middle adolescents can branch out and establish autonomous relationships with peers (Bronstein, Ginsburg, & Herrera, 2005; Joussemet, Koestner, Lekes, & Landry, 2005). From a developmental perspective, establishing positive relationships with peers constitutes a key task during childhood (Parker, Rubin, Erath, Wojslawowicz, & Buskirk, 2006). For example, friendships may provide children with a buffer against stressful life events and act as a protective factor against negative outcomes, such as depressive symptoms children may experience in response to dealing with chronic stressors (Bagwell, Schmidt, Newcomb, & Bukowski,

2000). Peers can be a key source of support when children are coping with significant stressors, such as parental illness (Kristjanson, Chalmers, & Woodgate, 2004). Thus, the impact of parental illness on child psychosocial functioning is an important topic.

Children living with an ill parent often have problems in psychosocial functioning. The Transactional Model of Stress and Coping (e.g., Bachanas et al., 2001; Gold Treadwell, Weissman, & Vichinsky, 2008; Thompson, Gil, Burbach, Keith, & Kinney, 1993) posits that environmental stressors encountered by children are responded to with efforts to minimize their distress. First, physical demands placed on parents who are chronically ill are likely to negatively impact the physical and psychological well-being of their children. These impairments also contribute to poorer parent communication styles marked by depression and irritability, which may further go on to impact children's peer relationships (i.e., children are using similar communication with parents and peers; De Judicibus & McCabe, 2004). Second, as children appraise how threatening their mother's illness is they make efforts to reduce distress. Because chronic illness is difficult to behaviorally control, children may rely heavily on mitigating stress through social support. Relying on peers and also parents may provide children with the resources to adaptively cope with the negative emotions tied to having a chronically ill parent. Further, although it is well recognized that children seek support from both parents and peers as a method of coping with stressful situations (e.g., Dubow & Ullman, 1989; Garmezy, 1983), the child may be facing a "catch 22"—that is, unable to obtain support from the parent due to the fact that the parent is unable to engage or assist during times of heightened illness.

Early studies on the effect of parental illness on child and adolescent psychosocial outcomes with parents and peers focused on children living with a parent with cancer. These studies had mixed results. In a review of 52 studies of the impact of parental cancer on children, Visser, Huizinga, van der Graaf, Hoekstra, and Hoekstra-Weebers (2004) reported that quantitative studies did not show any differences in social competence between children of parents with cancer and a norm group, while qualitative studies indicated school age children needed social support and that adolescents reported they had more people to rely on than did younger children. Among school age children with a mother or father with terminal cancer, Siegel et al., (1992) found the children had lower social competence than normal controls. However, in a study of maternal breast cancer on school-age children and a comparison group of classmates, Vannatta, Grollman, Noll, and Gerhardt (2008) found that children of mothers with breast cancer did not experience diminished numbers of friendships relative to comparison peers; they were just as likely to be nominated by classmates as a friend. Among 8 – 16 year old children of mothers diagnosed with breast cancer and mothers with benign breast biopsies, there was no evidence that children of mothers in initial diagnostic and treatment phases of breast cancer had increased adjustment problems compared to children whose mothers were not seriously ill (Hoke, 2001). Interestingly, children whose mothers had breast cancer did better in social activities when their mothers were more distressed, while adolescents whose mothers with benign biopsies did less well when their mothers were distressed. These discrepancies may have occurred as a result of studies varying in severity of mothers' illness. Perhaps the majority of mothers with breast cancer in Vannatta et al. (2008) and Hoke (2001) had less severe symptoms compared to the parents in the Siegel et al. (1992) study with terminal cancer. Consequently, children exposed to greater parental illness severity may be at greater risk for poorer psychosocial outcomes.

There have only been a few studies investigating psychosocial adjustment among children affected by maternal HIV/AIDS, and a limitation of the current literature is that the majority of studies have been restricted to cross-sectional investigations and have not used longitudinal methods to investigate whether mother's illness predicts poorer psychosocial

outcomes. Another limitation is that the studies typically rely only on parent report of child psychosocial functioning, rather than obtaining both parental and child report; children may give more accurate responses about their relationships with peers. Given the limitations, available studies have shown that children and adolescents of mothers living with HIV (MLH) have a greater likelihood of poorer psychosocial functioning, although the severity of illness has not yet been considered. Kotchick et al. (1997) examined child psychosocial adjustment in inner-city African-American families. The mother-child relationship quality was found to be important for child psychosocial functioning. Similarly, the psychosocial adjustment of ethnic minority youth 11 to 16 years of age living with an HIV-seropositive mother was compared with children in the same community (Reyland, McMahon, Higgins-Delessandro, & Luthar, 2002). Results indicated maternal infection represented risk for poorer parent-child relationships and less social support in relationships with parents and friends. In the Family Health Project (Forehand et al., 1998), children of HIV-infected mothers had more difficulties in all domains of psychosocial adjustment, including prosocial competence by mothers' reports, than comparison children.

Examining the psychosocial functioning of children affected by maternal HIV with both mother and peers longitudinally will provide a more accurate appraisal of whether MLH physical illness contributes positively or negatively to children's future psychosocial outcomes. Additionally, assessing MLH severity of illness among these associations may inform whether specific health conditions predict maladaptive parent and peer relationships. Finally, utilizing both parent and child report of psychosocial relationships is likely to give a more accurate portrayal of the quality of relationships children are exposed to with both peers and parents.

The purpose of the present study was to investigate longitudinally the psychosocial outcomes of young adolescents affected by maternal HIV/AIDS, focusing on both parent-child psychosocial ties, and peer relationships. The current study utilized data from the Parents and Children Coping Together study (PACT), a 15-year study (begun in 1997; currently in its 14th year) assessing mothers with HIV/AIDS and their well children every 6 months.

Methods

Participants

Mothers living with HIV/AIDS (MLH) and their well children were recruited to the Parents and Children Coping Together (PACT) study from primary care sites and AIDS service organizations in Los Angeles County. Medical chart abstraction was conducted to obtain MLH CD4 count and viral load, confirm diagnosis, and verify study eligibility. A sample of 135 MLH and their children were interviewed every six months (assessments spanned 3 years) beginning in 1997 when the children were age 5–11 (see Figure 1). In 2002, Parents and Adolescents Coping Together (PACT II) continued to follow 81 of the original families, as the children transitioned to early/middle adolescence, and 37 new families were recruited to the study. PACT III started in 2008 and is following 96 families. In this study, the focus is on predictors and outcomes from PACT II and PACT III, since we were able to assess psychosocial functioning from the child's perspective once they attained early/middle adolescence in PACT II. Thus, families ($N = 118$) who participated in PACT II and PACT III are included in the current analyses. Families were assessed every 6 months for 36 months in PACT II, and every 6 months for 18 months in PACT III, providing data at 11 time points across an 8 year period; 81% of PACT II families continued study participation in PACT III.

All study participants were English or Spanish speaking. The mothers' mean age at PACT II baseline was 39.2 ($SD = 5.9$); 60% were Latina, 28% African American, 5% White and 6% other/multiracial. About half (48%) of the youth were female. Youth mean age at PACT II baseline was 13.0 ($SD = 1.8$), and at the PACT III 18-month follow up interview was 19.1 ($SD = 1.9$). At PACT II baseline, 100% of the children lived with their mother who was the primary caretaker, and 21% of the children spoke with their father at least weekly. At PACT III 18-month follow-up, 72% of youths lived with their mother, 4% lived with their guardian, and 24% lived alone or with people other than their mother/guardian.

Procedures

Trained bilingual interviewers provided eligible participants with a complete description of the study; MLH and youth age 18 who agreed to participate then provided signed informed consent and youth age <18 provided signed assent. The Institutional Review Board at the University of California, Los Angeles, approved the study. Face-to-face interviews of mothers and adolescents were conducted separately in the family's home using a computer-assisted interviewing program on laptop computers. The mother interviews lasted 45 – 60 minutes and they received \$30 – \$35; the youth interviews lasted 45 – 90 minutes and they received \$25 – \$35 in PACT II and PACT III.

Measures

Predictor variables: Maternal Health Status—Several measures were used to assess maternal health at each assessment time-point. First, self-report maternal viral load was used. Due to a skewed distribution of viral load, the variable was dichotomized based at 500 cells/mL (see Murphy, Greenwell, Mouttapa, Brecht, & Schuster, 2006, for justification). A higher viral load (infection) indicates poorer health.

The Medical Outcome Short Form 36 (Ware & Sherbourne, 1992) was administered to the mothers. Three subscales were used for this analysis: physical functioning, which assesses the extent to which one's current health limits activities such as walking, climbing stairs, carrying groceries; vitality, which assesses one's energy level and fatigue; and bodily pain, which assesses one's level of pain and the extent to which pain interferes with daily activities. These scales were chosen because they provide both the mother's report of how she feels physically, and activity limitations (which may be more easily observable by the child). Higher scores indicate better functioning. Cronbach's alphas at the PACT II baseline assessment were .74, .79, and .83, respectively.

An HIV symptom illness checklist was used to assess 16 HIV-related symptoms in the past three months (e.g., unexpected weight loss, shortness of breath and coughing). A scale was calculated by summing positive responses.

Health-related anxiety was assessed using a four-item scale in which the mothers were asked about troubles with sleeping, eating, socializing, and work/school activities as a result of thinking about her health and HIV/AIDS (Murphy et al., 2001a). Mothers rated how often they had difficulty in each area (1 = not at all to 5 = always). The scale has been used with an HIV-infected population with good internal consistency reliability (Murphy, Steers, & Dello Stritto, 2001). Cronbach's alpha was .87 at PACT II baseline.

Child/adolescent outcome measures

Parent and peer attachment: The Inventory of Parent and Peer Attachment (IPPA; Armsden & Greenberg, 1987) was used to assess attachment at each PACT II and PACT III assessment. The IPPA yields 3 subscales each for mother and for peers (trust, communication, and alienation), and a global score for both mother and peer attachment

(e.g., “I like to get my mother’s point of view on things I’m concerned about;” “I wish I had a different mother;” “When we discuss things, my friends care about my point of view;” “My friends help me to talk about my difficulties”). For the PACT II baseline sample, Cronbach’s alphas for mother attachment were: trust, .85, communication, .79, alienation, .72, and total, .90; for peer attachment: .88, .89, .65, and .89, respectively.

Adolescent Autonomy: At each PACT II and PACT III assessment, autonomy was measured using the Autonomous Functioning Checklist (AFC: Sigafos, Feinstein, Damond, & Reiss, 1988), a parent-completed checklist designed to measure behavioral autonomous functioning in adolescents. In our previous work children affected by maternal HIV who had greater attachment to their mothers had higher autonomy (Murphy, Greenwell, Resell, Brecht, & Schuster, 2008). Autonomy was assessed because the American Academy of Child and Adolescent Psychiatry and other adolescent research has identified behaviors associated with early (12 – 14 yrs.) and middle (15 – 16 yrs.) adolescence, including: realization that parents are not perfect and identification with their faults; the search for new people to love in addition to parents; frequently changing relationships; and peer group influence; development of ideals and selection of role models (e.g., Conger, 1991; DiClemente, Hansen, & Ponton, 1996; Ginzberg, 1972; Marcia, 1980; Pruitt, 2000). Two scales, Self and Family Care, and Management autonomy were used in the analyses. The Management autonomy subscale contains 20 items that measure the extent to which the adolescent independently handles his or her interaction with the environment (e.g., “My teenager initiates friendships with peers, for example, plans or attends parties, outings, games, club meetings”). The Self and Family Care autonomy subscale contains 22 items measuring the extent to which basic daily maintenance activities are carried out by the adolescent (e.g., “My teenager prepares meals for other family members”). In the PACT II baseline sample, Cronbach’s alphas were .81 and .82, respectively.

Analysis: Growth curve modeling (Singer & Willett, 2003) using the mixed procedure from SAS (V 9.1) assessed the effects of the maternal health covariates on child outcome measures. As opposed to standard repeated measures analysis (focusing on incremental change through mean comparisons), growth curve modeling assesses both aggregate and individual change by evaluating case trajectories over time. The technique provides a richer and more flexible set of statistical model outcomes, including modeling of the covariance structure of the repeated measurements. For the current study, first order autoregressive covariance structure AR(1) was applied to account for covariance decay on the outcome measures, with restricted maximum likelihood (REML) estimation. Covariates were time-varying and mean centered, and age was given a starting point of zero to make results more interpretable. We focused on fixed effects from the models, including age, maternal health, and interaction effects between age and maternal health (significant interactions were evaluated through trajectory plots). The unconditional growth models with random effects and slopes for age are presented first, followed by the conditional models inclusive of the maternal health covariates. For the conditional models, estimates of effect sizes are also offered. Only fixed effects are evaluated.

Results

Unconditional Models

Unconditional growth models were first assessed using age as the sole predictor (see Table 1 for model parameter estimates and standard errors). All intercepts were significant from zero. Slope parameters for age were also significant, indicating that as the child moved from pre-adolescence through adolescence, parental attachment declined as did peer attachment, while autonomous behaviors increased (typical for populations across this age spectrum).

Conditional Models

Conditional models were next evaluated (see Table 1). Across the measures, intercept and age findings were generally similar to unconditional growth model findings; therefore we only summarize maternal health covariate effects and interactions between the covariates and age.

Parent attachment—Using the parent attachment subscales and total measure from the IPPA, MLH viral load was found to have a significant effect on parental alienation; as MLH viral load decreased, parental attachment increased. Main effects for MOS vitality show a similar pattern across most of the parental attachment measures. As MLH vitality increased, so did parental attachment. None of the other maternal health covariates significantly influenced parental attachment. Significant interaction effects between the covariates and age (for parental alienation and total parental attachment) are indicative that pre-adolescents report higher attachment than older adolescents, with attachment levels more stable for pre-adolescents regardless of maternal health (typical of child/adolescent populations, with higher levels of attachment and at younger ages).

Child/Adolescent attachment—MLH viral load was found to have a significant effect on all of the peer attachment measures; as MLH viral load decreased, peer attachment increased. Similar findings were noted for MOS vitality (on peer communication and total peer attachment), illness symptoms (on peer alienation), and health-related anxiety (on peer communication and total peer attachment). Greater MLH vitality and lower levels of health-related anxiety are associated with greater peer communication and total attachment, while fewer illness symptoms are related to greater attachment to peers (less peer alienation). Significant interaction effects between the covariates and age indicate pre-adolescents report higher peer attachment than older adolescents, with attachment levels more stable for pre-adolescents regardless of maternal health.

Child/Adolescent autonomy—For the self and family care autonomy measure (assessing the extent to which basic daily maintenance activities are carried out by the adolescent), MLH viral load was found to be a significant predictor; greater MLH viral load was associated with more autonomous activities by the child (greater independence). A similar pattern of findings on this outcome is also noted for the other covariates. Less MLH vitality and physical functioning, and greater bodily pain, more illness symptoms, and greater health-related anxiety are associated with more autonomous activities reported by the child. Significant interaction effects between the covariates and age indicate children in pre-adolescence report fewer autonomous activities than those in later adolescence (i.e., later adolescence is associated with family autonomy), with reported behaviors being more stable for those in pre-adolescence regardless of maternal health.

For management activity autonomy (measuring the extent to which the adolescent independently handles his or her interaction with the environment), only one covariate evidenced significance; as MLH illness symptoms increased, so did management activity autonomy.

Effects for Conditional Models

Regarding effect sizes for the above conditional models, pseudo R-Square statistics were calculated per recommendations by Singer and Willett (2003, pgs. 102 – 103) to estimate the overall variability explained. Due to the various caveats associated with these effect statistics (see Singer & Willett), we only present a general summary of the model effects. From Table 1, models with covariate or interaction findings significant at the .01 or better levels evidenced medium to large effects (e.g., at least 20% variance explained in the

outcomes), while models with a single covariate significant at $p < .05$ generally evidenced small effects.

Discussion

Findings from this study give a fairly cohesive picture of the impact of maternal HIV on young adolescents' psychosocial functioning with their mothers and with peers. In terms of their relationship with their MLH, adolescent psychosocial functioning is negatively impacted by maternal illness, specifically viral load count and vitality levels. The relationship between maternal illness and young adolescents' relationship with peers was even more striking. Several indicators of increased maternal illness (including viral load, vitality, illness symptoms, health-related anxiety) predicted less attachment with peers. These findings suggest that severity of MLH chronic illness is a strong marker of future difficulties for young adolescent psychosocial functioning among both parents and peers.

It appears that young adolescents encountering a significant stressor, such as their MLH experiencing increasing illness, respond in ways that are maladaptive for both mother and peer relationships. They feel more removed from their MLH when she is ill; when her energy levels are better, their attachment to her increases. This may be a result of MLH physical illness limiting their ability to engage in adaptive communication styles and parenting practices, which may discourage young adolescents from communicating with her, and ultimately leading to increased alienation between mother and child. While this makes sense from a family interactive perspective, it does bring up a number of issues. The MLH are likely to be aware to some extent of these fluctuations in their relationship during periods of heightened illness--and the guilt they must feel if they are cognizant that their own physical health is what drives these changes must be a heavy burden. When mothers perceive themselves as the cause of their children's stress they may develop guilt and depressive symptoms, which would only serve to exacerbate the difficulties between them and their children.

Additionally, the study found that multiple indicators of mother's illness severity influence young adolescents' relationship with peers. The healthier MLH are, the more engaged adolescents are with their peers. Stress and coping theory posits that children may seek out social support to cope with negative feelings, particularly when exposed to stressors that are difficult to manage, like mothers' chronic illness. However, in this study young adolescents did not appear to utilize peers as adaptive social support as mothers' illness declined. One explanation is that as the youth perceive their mother's health declining, they begin to disengage themselves from others as a way to minimize distress and take on responsibilities they are needed for at home. On the other hand, when mother's health status is better, the youth may perceive the illness as 'controlled' and experience active and more adaptive coping skills, such as utilizing social support from both mothers and peers. It would further burden MLH to know their illness status not only can detrimentally effect their adolescent's psychosocial functioning with them, but also with the adolescents' peers. The adolescents may not even always pick up on their MLHs' level of physical functioning and illness symptoms, but may be aware of problems due to MLH anxiety (i.e., MLH health-related anxiety significantly predicted low communication between adolescents and peers). Furthermore, given the age frame of this sample of young adolescents, it is likely they spend a great deal of time assisting MLH when they are ill (as indicated in the next set of findings, below). Thus, when MLH are well, the adolescents are likely to have more time to spend with friends and engage in more peer activities.

While this study was observational and did not include a control group, and causation cannot be inferred, in terms of adolescent individuation/autonomy, with MLH increased illness we

found an association with higher levels of adolescent autonomy. It is possible that when adolescents have to take more of a caregiver role (for both family and self) during times of maternal illness, they are able to “step up to the plate” and take on more autonomous responsibility. Serving in a care-taking role/capacity can strengthen bonds of closeness, which may mitigate some of the negative effects of maternal illness on the mother-child bond. As Bauman et al. (2006) have noted, the child-parent bond is the most important predictor of child mental health, and children may benefit from helping make a parent feel better, with their importance in such a role to the family being a source of self-esteem for them. However, this needs to be replicated in longitudinal studies.

Regarding clinical significance of our findings, although no norms or general guidelines have been published regarding the outcomes utilized, we can extrapolate that growth or decline in these measures due to the covariates utilized are important. For example, a less secure attachment as measured by the IPPA has been linked to clinical diagnosis of depression, delinquency, and higher levels of loneliness (Armsden & Greenberg, 1987), and higher scores on the AFC indicate greater adolescent developmental competence (Sigafos et al., 1988). In addition, covariates that were statistically significant in the conditional growth models, for example, a parameter estimate of .23 for MLH vitality/maternal communication (indicating that for every point that vitality increases, maternal communication also increases about a quarter of a point), could be clinically significant for youth with average communication scores (e.g., 32 – 36) whose scores subsequently increase over time due to strong increases in MLH vitality.

Several limitations should be considered. First, the sample is restrictive in terms of size and geographical area; consequently, caution should be taken to generalize findings. Second, although we were able to assess severity of mother’s illness in relation to psychosocial outcomes, comparisons to a control group of children with non-HIV infected mothers were not conducted. Third the significant findings at the .05 level may be due to experiment-wise error (reflecting inflated Type 1 error) because of the number of outcome variables and effects evaluated. Thus, it is possible some of these findings may be statistical artifact. However, most of our findings were at .01 or .001, thus limiting this concern. Fourth and finally, some of the conditional growth models evidenced significant random effects – although not investigated here, these random effects are suggestive that more complex models may be viable. Additional models could include additional covariates and interaction terms, but unfortunately our sample size and extensive number of longitudinal waves limited the complexity of the models assessed.

Very little has been documented on this topic in this population. The majority of studies thus far suggest that children living with a seriously ill parent tend to present with relatively poor psychosocial functioning (Armistead, Klein, & Forehand, 1995; Forehand et al., 1998; Reyland et al., 2002). This longitudinal study indicates that the level of maternal illness strongly impacts the child’s psychosocial functioning. Thus, children of mothers living with HIV may not automatically fare less well in terms of their psychosocial functioning outcomes, rather, adjustment may vary with the health functioning of their mother. There are other factors that would be interesting to investigate in conjunction with this finding. For example, child coping skills and resiliency, as well as child relationships with other supportive adults and community involvement, may also be factors that temper how much maternal illness effects child psychosocial functioning.

Acknowledgments

This research was supported by Grant # 5R01MH057207 from the National Institute of Mental Health (NIMH) to the first author.

References

- Armistead L, Klein K, Forehand R. Parental physical illness and child functioning. Special Issue: The impact of the family on child adjustment and psychopathology. *Clinical Psychology Review*. 1995; 15:409–422.
- Armsden GC, Greenberg MT. The Inventory of Parent and Peer Attachment: Individual differences and the relationship to psychological well-being in adolescence. *Journal of Youth and Adolescence*. 1987; 16:427–454.
- Bachanas PJ, Kullgren KA, Schwartz KS, McDaniel JS, Smith J, Nesheim S. Psychological adjustment in caregivers of school-age children infected with HIV: Stress, coping, and family factors. *Journal of Pediatric Psychology*. 2001; 26:331–342. [PubMed: 11490034]
- Bagwell, CL.; Schmidt, ME.; Newcomb, AF.; Bukowski, WM. Friendship and peer rejection as predictors of adult adjustment. In: Nangle, DW.; Erdley, CA., editors. *The role of friendship in psychological adjustment*. San Francisco, CA: Josey-Bass; 2000. p. 25–49.
- Bauman LJ, Foster G, Silver EJ, Berman R, Gamble I, Muchaneta L. Children caring for their ill parents with HIV/AIDS. *Vulnerable Children and Youth Studies*. 2006; 1:56–70.
- Baumrind D. Parental disciplinary patterns and social competence in children. *Youth & Society*. 1978; 9:239–251.
- Bronstein P, Ginsburg GS, Herrera IS. Parental predictors of motivational orientation in early adolescence: A longitudinal study. *Journal of Youth and Adolescence*. 2005; 34:559–575.
- Conger, JJ. *Adolescence and youth: Psychological development in a changing world*. 4. Denver, CO: Harper Collins; 1991.
- De Judicibus MA, McCabe MP. The impact of parental multiple sclerosis on the adjustment of children and adolescents. *Adolescence*. 2004; 39:551–569. [PubMed: 15673230]
- DiClemente, RJ.; Hansen, WB.; Ponton, LE. Adolescents at risk. In: DiClemente, RJ.; Hansen, WB.; Ponton, LE., editors. *Handbook of Adolescent Health Risk Behavior*. New York: Plenum Press; 1996. p. 1–4.
- Dubow EF, Ullman DG. Assessing social support in elementary school children: The survey of children's social support. *Journal of Clinical Child Psychology*. 1989; 18:52–64.
- Forehand R, Steele R, Armistead L, Morse E, Simon P, Clark L. The Family Health Project: Psychosocial adjustment of children whose mothers are HIV infected. *Journal of Consulting and Clinical Psychology*. 1998; 66:513–520. [PubMed: 9642890]
- Garmezy, N. Children under stress: Perspectives on antecedents and correlates of vulnerability and resistance to psychopathology. In: Rabin, AL.; Arnoff, J.; Barclay, AM.; Zucker, RA., editors. *Further explorations in personality*. New York: Wiley; 1981. p. 196–296.
- Garmezy, N. Stressors of childhood. In: Garmezy, N.; Rutter, M., editors. *Stress, coping, and development in children*. New York: McGraw Hill; 1983. p. 43–84.
- Ginzberg E. Toward a theory of occupational choice: A restatement. *Vocational Guidance Quarterly*. 1972; 20:169–176.
- Gold JI, Treadwell L, Weissman E, Vichinsky E. An expanded transactional stress and coping model for siblings of children with sickle cell disease: Family functioning and sibling coping, self-efficacy and perceived social support. *Child: Care, Health, Development*. 2008; 34:491–502.
- Hoke LA. Psychosocial adjustment in children of mothers with breast cancer. *Psycho-Oncology*. 2001; 10:361–369. [PubMed: 11536414]
- Joussemet M, Koestner R, Lekes N, Landry R. A longitudinal study of the relationship of maternal autonomy support to children's adjustment and achievement in school. *Journal of Personality*. 2005; 73:1215–1235. [PubMed: 16138871]
- Kotchick BA, Forehand R, Brody G, Armistead L, Simon P, Morse E, Clark L. The impact of maternal HIV-infection on parenting in inner-city African American families. *Journal of Family Psychology*. 1997; 11:447–461.
- Kristjanson LJ, Chalmers KI, Woodgate R. Information and support needs of adolescent children of women with breast cancer. *Oncology Nursing Forum*. 2004; 31:111–119. [PubMed: 14722595]
- Marcia, JE. Identity in adolescence. In: Adelson, J., editor. *Handbook of adolescent psychology*. New York: Wiley; 1980. p. 159–187.

- Murphy DA, Durako SJ, Moscicki AB, Vermund SH, Ma Y, Schwarz DF, Muenz L. No change in health risk behaviors over time among HIV infected adolescents in care: Role of psychological distress. *Journal of Adolescent Health*. 2001a; 29S:57–63.
- Murphy DA, Greenwell L, Mouttapa M, Brecht ML, Schuster MA. Physical health of mothers with HIV/AIDS and the mental health of their children. *Journal of Developmental and Behavioral Pediatrics*. 2006; 27:386–395. [PubMed: 17041275]
- Murphy DA, Greenwell L, Resell J, Brecht ML, Schuster MA. Early and middle adolescents' autonomy development: Impact of maternal HIV/AIDS. *Clinical Child Psychology and Psychiatry*. 2008; 13:253–276. [PubMed: 18540228]
- Murphy DA, Steers WN, Dello Stritto ME. Maternal disclosure of mother's HIV serostatus to their young children. *Journal of Family Psychology*. 2001; 15:441–450. [PubMed: 11584794]
- Parker, JG.; Rubin, KH.; Erath, SA.; Wojslawowicz, JC.; Buskirk, AA. Peer relationships, child development, and adjustment: A developmental psychopathology perspective. In: Cicchetti, D.; Cohen, DJ., editors. *Developmental psychopathology: Vol. 1: Theory and Methods*. 2. New York: Wiley; 2006. p. 96-161.
- Pruitt, D. *Your adolescent: Emotional, behavioral, and cognitive development from early adolescence through the teen years*. New York: Collins; 2000.
- Radke-Yarrow M, Brown E. Resilience and vulnerability in children of multiple-risk families. *Development and Psychopathology*. 1993; 5:581–592.
- Reyland SA, McMahon TJ, Higgins-Delessandro A, Luthar SS. Inner-city children living with an HIV-Seropositive mother: Parent-child relationships, perception of social support, and psychological disturbance. *Journal of Child & Family Studies*. 2002; 11:313–329.
- Siegel K, Mesagno FP, Karus D, Christ G, Banks KB, Moynihan R. Psychosocial adjustment of children with a terminally ill parent. *Journal of the American Academy of Child and Adolescent Psychiatry*. 1992; 31:327–333. [PubMed: 1564035]
- Sigafoos, AD.; Feinstein, CB.; Damond, M.; Reiss, D. The measurement of behavioral autonomy in adolescence: The autonomous functioning checklist. In: Feinstein, SC.; Esman, AH.; Looney, JG.; Orvin, GH.; Schimel, JL., editors. *Adolescent psychiatry: Developmental and clinical studies*. Chicago: University of Chicago Press; 1988. p. 15-462.
- Singer, J.; Willett, J. *Applied Longitudinal Data Analysis*. New York: Oxford University Press; 2003.
- Sroufe LA, Rutter M. The domain of developmental psychopathology. *Child Development*. 1984; 55:17–29. [PubMed: 6705619]
- Thompson RJ, Gil KM, Burbach DJ, Keith BR, Kinney TR. Psychological adjustment of mothers of children and adolescents with sickle cell disease: The role of stress, coping methods, and family functioning. *Journal of Pediatric Psychology*. 1993; 18:549–559. [PubMed: 8295079]
- Vannatta K, Grollman JA, Noll RB, Gerhardt CA. Impact of maternal breast cancer on the peer interactions of children at school. *Psycho-Oncology*. 2008; 17:252–259. [PubMed: 17575564]
- Visser A, Huizinga GA, van der Graaf WT, Hoekstra HJ, Hoekstra-Weebers JE. The impact of parental cancer on children and the family: A review of the literature. *Cancer Treatment Reviews*. 2004; 30:683–694. [PubMed: 15541578]
- Ware JE, Sherbourne CD. The MOS 36-item short-form health survey (SF-36): I. Conceptual framework and item selection. *Medical Care*. 1992; 30:473–483. [PubMed: 1593914]

Figure 1. PACT Study Sample Participation

*Of these 54 families, 21 mothers had died, 19 could not be located, 7 declined further participation, 6 lost custody of their children, and 1 was incarcerated.

**Of these 31 mothers, 12 had died, 14 could not be located, 2 declined further participation, and 3 lost custody of their children; with guardian consent, 8 youth whose mothers died or lost custody continued in PACT III, and 23 youth discontinued participation when their mothers did so; 1 youth whose mother continued in PACT III was unable to participate due to deployment overseas. One family from PACT that was not in PACT II participated in PACT III.

Parameter Estimates, Standard Errors, and Significance Tests for Unconditional Growth Models, and Conditional Growth Models with Interactions on Child/Adolescent Closeness Outcomes (Fixed Effects only)

	Child/Adolescent Outcome Measures, Estimate (SE)									
	IPPA Maternal Trust					IPPA Maternal Alienation				
	IPPA Maternal Trust	IPPA Maternal Communication	IPPA Maternal Alienation	IPPA Maternal Global Attachment	IPPA Peer Trust	IPPA Peer Communication	IPPA Peer Alienation	IPPA Peer Global Attachment	AFC Self and Family Care	AFC Management Autonomy
Intercept	46.57*** (0.45)	38.18*** (0.44)	29.92*** (0.43)	114.74*** (1.11)	45.62*** (0.45)	32.19*** (0.41)	34.99*** (0.44)	112.71*** (0.99)	14.63*** (0.88)	23.64*** (0.76)
Age	-1.23*** (0.11)	-0.87*** (0.11)	-2.04*** (0.097)	-4.16*** (0.27)	-0.95*** (0.11)	-0.26** (0.10)	-2.46*** (0.10)	-3.66*** (0.24)	3.26*** (0.21)	2.95*** (0.21)
Maternal Health Covariates (Intercept and Slope Fixed Effects Only)										
Viral Load										
Intercept	46.41*** (0.52)	37.88*** (0.52)	29.84*** (0.51)	114.23*** (1.31)	45.24*** (0.55)	31.90*** (0.51)	34.37*** (0.63)	111.48*** (1.22)	14.20*** (0.94)	22.81*** (0.90)
Age	-1.22*** (0.12)	-0.82*** (0.12)	-2.064*** (0.11)	-4.14*** (0.29)	-0.93*** (0.12)	-0.27* (0.12)	-2.34*** (0.12)	-3.54*** (0.28)	3.33*** (0.24)	3.20*** (0.24)
Viral Load	-0.17 (1.13)	-0.13 (1.44)	-3.67** (1.11)	-4.015 (2.85)	-2.66* (1.20)	-2.70* (1.10)	-4.65*** (1.15)	-10.068*** (2.65)	4.52* (2.025)	-1.90 (1.94)
Interaction (Age by Viral Load)	0.050 (0.21)	-0.023 (0.22)	0.88*** (0.21)	0.87 (0.54)	0.28 (0.23)	0.27 (0.21)	0.95*** (0.22)	1.50** (0.51)	-0.96* (0.38)	0.14 (0.37)
MOS Vitality										
Intercept	46.50*** (0.45)	38.088*** (0.44)	29.83*** (0.43)	114.57*** (1.12)	45.51*** (0.46)	32.18*** (0.43)	34.70*** (0.45)	112.33*** (1.034)	14.60*** (0.82)	22.63*** (0.77)
Age	-1.20*** (0.11)	-0.84*** (0.11)	-2.082*** (0.098)	-4.087*** (0.27)	-0.91*** (0.11)	-0.25* (0.11)	-2.38*** (0.11)	-3.54*** (0.25)	3.25*** (0.21)	2.94*** (0.21)
Vitality	0.14 (0.094)	0.23* (0.090)	0.21* (0.089)	0.59* (0.23)	0.12 (0.095)	0.26** (0.087)	0.11 (0.093)	0.48* (0.21)	-0.41* (0.17)	0.13 (0.16)
Interaction (Age by Vitality)	-0.017 (0.017)	-0.031 (0.017)	-0.044** (0.016)	-0.091* (0.042)	-0.019 (0.017)	-0.031 (0.016)	-0.040* (0.017)	-0.087* (0.039)	0.048 (0.031)	-0.019 (0.029)
MOS Physical Functioning										
Intercept	46.47*** (0.45)	38.045*** (0.44)	29.87*** (0.43)	114.48*** (1.12)	45.52*** (0.46)	32.13*** (0.43)	34.77*** (0.45)	112.34*** (1.03)	14.72*** (0.82)	23.65*** (0.76)
Age	-1.19*** (0.11)	-0.83*** (0.11)	-2.024*** (0.099)	-4.085*** (0.27)	-0.92*** (0.11)	-0.25* (0.11)	-2.39*** (0.11)	-3.55*** (0.25)	3.22*** (0.21)	2.95*** (0.21)
Physical Functioning	0.068 (0.084)	0.14 (0.081)	0.0011 (0.080)	0.21 (0.21)	-0.0085 (0.086)	0.071 (0.079)	0.072 (0.084)	0.12 (0.19)	-0.40** (0.15)	-0.087 (0.14)
Interaction (Age by Physical Functioning)	-0.016 (0.016)	-0.029 (0.015)	-0.0013 (0.015)	-0.047 (0.038)	-0.00064 (0.016)	-0.014 (0.015)	-0.016 (0.016)	-0.027 (0.036)	0.045 (0.028)	0.023 (0.026)
MOS Bodily Pain										
Intercept	46.47*** (0.45)	38.077*** (0.44)	29.87*** (0.43)	114.52*** (1.12)	45.51*** (0.46)	32.15*** (0.43)	34.79*** (0.45)	112.36*** (1.03)	14.63*** (0.81)	23.65*** (0.76)
Age	-1.20*** (0.11)	-0.84*** (0.11)	-2.024*** (0.099)	-4.097*** (0.27)	-0.92*** (0.11)	-0.25* (0.11)	-2.40*** (0.11)	-3.56*** (0.25)	3.24*** (0.21)	2.95*** (0.21)
Bodily Pain	0.000078 (0.17)	0.16 (0.16)	-0.052 (0.16)	0.10 (0.41)	-0.11 (0.17)	0.12 (0.16)	0.20 (0.17)	0.21 (0.38)	-0.99*** (0.30)	-0.28 (0.28)
Interaction (Age by Bodily Pain)	0.0085 (0.029)	-0.027 (0.028)	0.0082 (0.028)	-0.010 (0.071)	0.018 (0.029)	-0.018 (0.027)	-0.027 (0.029)	-0.023 (0.066)	0.10* (0.051)	0.015 (0.048)
Illness Symptoms										
Intercept	46.42*** (0.46)	38.03*** (0.44)	29.83*** (0.43)	114.39*** (1.12)	45.52*** (0.46)	32.15*** (0.43)	34.77*** (0.45)	112.37*** (1.036)	14.50*** (0.81)	23.49*** (0.76)

Child/Adolescent Outcome Measures: Estimate (SE)										
	IPPA Maternal Trust			IPPA Maternal Alienation			IPPA Maternal Global Attachment			
	IPPA Maternal Trust	IPPA Maternal Communication	IPPA Maternal Alienation	IPPA Maternal Alienation	IPPA Maternal Global Attachment	IPPA Peer Trust	IPPA Peer Communication	IPPA Peer Alienation	IPPA Peer Global Attachment	
Age	-1.20*** (0.11)	-0.84*** (0.11)	-2.01*** (0.098)	-4.08*** (0.27)	-0.92*** (0.11)	-0.25* (0.11)	-2.38*** (0.11)	-3.55*** (0.25)	3.26*** (0.21)	2.93*** (0.20)
Illness Symptoms	0.29 (0.19)	0.011 (0.19)	-0.074 (0.18)	0.23 (0.47)	0.055 (0.20)	-0.15 (0.18)	-0.43* (0.19)	-0.48 (0.44)	1.079** (0.34)	1.07*** (0.32)
Interaction (Age by Illness Symptoms)	-0.041 (0.036)	0.013 (0.035)	0.026 (0.034)	-0.0062 (0.088)	-0.020 (0.037)	0.023 (0.034)	0.083* (0.036)	0.076 (0.082)	-0.12 (0.064)	-0.11 (0.060)
Health-Related Anxiety										
Intercept	46.46*** (0.46)	38.070*** (0.44)	29.90*** (0.44)	114.51*** (1.12)	45.61*** (0.46)	32.28*** (0.43)	34.89*** (0.45)	112.68*** (1.03)	14.33*** (0.82)	23.54*** (0.77)
Age	-1.20*** (0.11)	-0.84*** (0.11)	-2.027*** (0.099)	-4.098*** (0.27)	-0.93*** (0.11)	-0.27* (0.11)	-2.41*** (0.11)	-3.60*** (0.25)	3.29*** (0.21)	2.94*** (0.21)
Health-Related Anxiety	0.042 (0.12)	-0.011 (0.11)	-0.041 (0.11)	0.015 (0.29)	-0.15 (0.12)	-0.25* (0.11)	-0.21 (0.12)	-0.63* (0.27)	0.64** (0.21)	0.27 (0.19)
Interaction (Age by Health-Related Anxiety)	-0.0077 (0.021)	0.0066 (0.021)	0.0023 (0.020)	-0.0065 (0.052)	0.001 (0.021)	0.019 (0.020)	0.022 (0.021)	0.043 (0.048)	-0.072 (0.037)	-0.047 (0.035)

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

Note: Model intercepts are estimated mean outcomes at age zero.