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## Perceived Bonding by Parents Living With HIV and Their Adolescent Children

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This study examined the associations between parent and adolescent reports of bonding within families and the relationships among reported parental bonding, family conflict and adolescent stress. A total of 118 families from Anhui, China, were recruited for this study. Two family-level bonding scores were constructed: the average of and difference between parent and adolescent bonding scores. Study results indicated that the difference between parent and adolescent bonding reports was associated with higher levels of adolescent daily stress. A negative association was observed between average family-level bonding and the level of parent-reported conflict. Our findings highlight the importance of combining data from both parents and adolescents when studying issues related to family wellbeing.

Previous studies have found strong connections between parental bonding and child's mental health (Avagianou & Zafiropoulou, 2008; Rigby, Slee, & Martin, 2007). Adolescents with poor parental bonding relationships are more likely to develop emotional and psychological problems in later life (Kraaij et al., 2003; Lavasani, Borhanzadeh, Afzali, & Hejazi, 2011). Parental bonding not only directly affects the psychosocial wellbeing of children but also correlates with positive family functioning (Lavasani et al., 2011). Parental bonding also affects childhood stress, anxiety and adverse events (Bogels & van Melick, 2004; Kraaij et al., 2003). For example, Kraaij et al. (2003) reported that adolescents with a poor bonding relationship were more likely to have depressive symptoms when faced with adverse events when compared with adolescents with better parental bonding.

HIV infection is a stressful event for both parents and children. Adolescents living with parents

who are HIV-infected face many challenges related to parental chronic illness (Murphy, Marelich, Armistead, Herbeck, & Payne, 2010; Nöstlinger, Bartoli, Gordillo, Roberfroid, & Colebunders, 2006). When children encounter a stressful situation, parental availability and care is crucial for helping them develop necessary social skills. However, parents living with HIV (PLH) or AIDS are often depressed, which limits their capacity to establish a normal family structure, healthy relationships, and successful parenting skills (Allen et al., 2014; Lachman, Cluver, Boyes, Kuo, & Casale, 2014). Parental HIV infection might force adolescents to undertake adult responsibilities such as caring for their ill parent, younger siblings, or other family members (Rotheram-Borus, Stein, & Rice, 2014; Tompkins, 2007). Children living in HIV-affected families tend to have weak parent-child bonding because of their parent's chronic illness (Bond et al., 2010; Stein et al., 2000). Weak parental bonding might contribute to the risk for childhood behavioral and psychological problems (Forehand et al., 2002; Ji, Li, Ding, Xiao, & Tian, 2012; Lee, Lester, & Rotheram-Borus, 2002; Nöstlinger et al., 2006; Sun, Li, Ji, Lin, & Semaan, 2008).

Assuming that parents and children have overlapping yet discrete perceptions of their relationship, more researchers have begun to address the

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levels of agreement between parent and child self-reports of bonding within a family (Athay, Riemer, & Bickman, 2012; Guion, Mrug, & Windle, 2009; de Los Reyes, Goodman, Kliewer, & Reid-Quinones, 2010; Parker, Johnson, Jones, Haynie, & Cheng, 2014). Previous studies have also indicated that the agreement between parent and child views on the family environment and its associated relationships was moderate (Li, Jiang, Lord, & Rotheram-Borus, 2007; Parker et al., 2014; Rebholz et al., 2014). Reports on parental bonding and relationships might not be consistent between parents and their children because parents are more likely to provide higher overall scores regarding bonding and relationship quality than their children (Aquilino, 1999; Bogels & van Melick, 2004), as youth tend to emphasize differences with parents in order to achieve a sense of autonomy and emancipation from the family of origin (Aquilino, 1999). The existing literature also explores the implications of the discrepancies between child and parent perceptions of behavior based on the assumption that these discrepancies reflect the quality of family interactions and suggest potential causes for child behavioral problems (Guion et al., 2009; Parker et al., 2014).

To our knowledge, this study is the first to examine the agreement between parent- and adolescent-reported bonding and its relationships with parent-perceived family conflict and adolescent-reported stress within HIV-affected families. The following research questions were addressed: (1) self-reported bonding levels and their agreement between parents and adolescents were assessed to examine the level of similarities between the bonding reports of parents and their adolescent children; (2) the levels or patterns of agreement between parents and adolescents reports of bonding were examined with regard to parent-reported family conflicts; and (3) the level of bonding and the agreement between the reports of parents and their children were linked to adolescent-reported everyday stress.

## METHODS

### Participant Recruitment and Data Collection

This study was a part of a randomized controlled trial of a multilevel intervention for HIV-affected families in Anhui Province, China, where the majority of HIV infections were caused by paid plasma donations in the early 1990s (Ji, Detels, Wu, & Yin, 2006). The baseline data were collected from

late 2011 to early 2013. The inclusion criteria for parents were (1) a HIV positive status, (2) at least 18 years old, (3) a resident of one of the preselected villages for study, and (4) having at least one child living at home. Potential participants were fully informed of the study objective, procedure, confidentiality issue, and voluntary nature of the study. Participants who consented were asked to invite their child(ren) to participate in the study. With the permission to contact their child(ren), the study outreach staff worked with the PLH parents to meet with the child(ren) to obtain child assent. The child assent form was written in age-appropriate language which introduced the study purpose, procedure, potential risks and benefits. Voluntary participation was particularly emphasized in the child assent. After written informed consent or assent was obtained from both PLH parent and the adolescent children, participants completed an assessment using the Computer Assisted Personal Interview method. Trained interviewers used laptop computers to read questions to the participant and entered their answers directly into a computer database. All assessments were conducted in a private room behind closed doors, usually a private office at local village clinic. The Institutional Review Boards of the collaborating institutes in China and the United States reviewed and approved the study protocol.

A total of 480 families affected by HIV participated in the intervention trial. Of these families, 136 had adolescent children aged 13–18 years old. For the purpose of this study, 16 families with two parents infected with HIV and three families with more than one adolescent child were excluded, resulting in a final sample of 118 families with one HIV-infected parent and one adolescent child.

### Measures

Parent-reported family conflict was measured using the Family Functioning Scale (Bloom, 1985). The scale was validated and showed satisfactory psychometric properties (Bloom, 1985). The original scale was a 75-item survey that addressed 15 topics reflecting family relationships, system maintenance, and personal growth dimensions. In order to minimize survey fatigue and respondent burden, we adopted only the family conflict subscale (five items) based on research interests. This subscale was previously piloted in China (Li, Ji, Ding, Tian, & Lee, 2012). The answers for each of the questions ranged from 1 to 4, where 1 indicated *very untrue for my family* and 4 indicated *very true for my family*.

For example, parents were asked whether they fought much and whether family members became angry enough to throw things. The overall scale was constructed by summing the five items; one question was reverse-coded such that higher scores indicated more conflict among family members (Cronbach's  $\alpha = .71$ ).

Adolescent-reported daily stress was measured using the Everyday Stressors Index Adolescent version (ESI-A) originally developed by Hall (1983). This scale has been used in several previous studies (Charoensuk, 2007; Peden, Rayens, Hall, & Grant, 2004), and a short version of this instrument was piloted in China (Cronbach's  $\alpha = .79$ ) (Ji et al., 2012) with 11 questions that addressed topics such as "Must take care of others in the family," "Worrying about the health of family members," "Disagreeing with teachers or other adults," and "Issues concerning exams or tests (e.g., failing exams)." In this study, adolescents rated how much each of the 11 concerns currently worried them every day on a 4-point scale ranging from 1 (*not at all*) to 4 (*a great deal*). A summary score was computed, and higher scores denoted more adolescent-reported stress (Cronbach's  $\alpha = .75$ ).

Parental bonding was measured using the Parental Bonding Instrument (Parker, Tupling, & Brown, 1979). The original scale consisted of 25 items on two separate dimensions: care and overprotection. Given the cultural context of this study, we included only the care dimension of the original instrument that consisted of 12 items reflecting parental warmth and interest. Both parents and their adolescents received similar questions about their relationships with each other. For instance, parents were asked how often statements such as "I speak to the child in a tone that is warm and friendly" or "I have an even temper toward my child" applied to them. Adolescent children were asked similar but slightly modified questions (e.g., "My parents speak to me in a tone that is warm and friendly" or "My parents have an even temper toward me"). The scale ranged from 0 to 3, where 0 indicated *very unlikely* and 3 indicated *very likely*. The overall score was constructed by summing the 12 items, and higher scores indicated more optimal parental bonding (Cronbach's  $\alpha$ s = .74 and .80 for parents and adolescents, respectively).

To answer the research questions of interest, we constructed two types of "paired" bonding measures. First, two family-level bonding scores were constructed for each family: the average of and the difference between the parent and adolescent bonding scores. Second, we categorized

families into four different groups based on whether their "paired" median parent and adolescent bonding scores were lower or higher than the paired cutoff values of 24 and 26, respectively (MacCallum, Zhang, Preacher, & Rucker, 2002). We chose the parent and child medians as the paired cutoff values to ensure that we would have a reasonable sample size for each bonding group because the overall sample size was moderate. A total of 118 parent-adolescent pairs were included in the study. The four parent-child bonding groups represented (1) parents whose bonding scores were lower than the parent cutoff value but whose adolescent's bonding score was higher than the adolescent cutoff score (Parent Low - Child High;  $n = 27$  pairs), (2) parents and adolescents whose bonding scores were both higher than the paired cutoff values (Parent High - Child High;  $n = 26$  pairs), (3) parents and adolescents whose bonding scores were both lower than the paired cutoff values (Parent Low - Child Low;  $n = 35$  pairs), and (4) parents whose bonding scores were higher than the parental cutoff value but whose adolescent's bonding score was lower than the adolescent cutoff value (Parent High - Child Low;  $n = 30$  pairs).

### Statistical Analyses

Descriptive statistics and frequency distributions of parents' and adolescents' sociodemographic characteristics as well as the parent-reported family conflict and adolescent-reported daily stress measures were summarized for each of the four parent-child bonding groups. We assessed the associations between each of the constructed bonding measures (family-level bonding scores and parent-child bonding group) and parent-reported family conflict and adolescent-reported daily stress. We used a linear mixed-effects model to examine each of these associations. Because the participants were recruited from different counties, each model included a county-level random effect to account for the correlations between participants within the same county. Furthermore, the model allowed the residual variance to vary across counties. We also performed adjusted regression models by including parent age, gender, marital status, income, and education in the parental model (parent-reported family conflict) as well as adolescent age and gender and parental education in the adolescent model (adolescent-reported daily stress). The adjusted analyses are shown. All statistical analyses were performed using the SAS System for Windows version 9.3 (SAS Institute Inc., Cary,

NC, United States), and all graphs were generated using the publicly available statistical software R (R Core Team, 2014).

**RESULTS**

**Individual and Group Characteristics**

Table 1 presents the sample characteristics and the descriptive statistics of the primary measures, both overall and by parent-child bonding group. The overall mean age of parents was 48 years old, and more than half of the parents were between 41 and 50 years old. The mean age of parents and adolescents was the highest in the Parent Low – Child High group (51 and 15.4 years old, respectively); over 81% of the parents in this bonding group were 41 years of age or older ( $p = .024$ ). The mean age of the adolescent participants was 15 years old and 54% were 13–15 years old. Total of 55 parents (46%) and 62 adolescents (53%) were

male. No significant gender differences were observed with regard to either the parent or adolescent participants. Over three quarters of the parents (78%) were married. More than one-third of the parents were illiterate, and the average annual family income was 13,047 Yuan (\$2,103). The parent participants in the Parent High – Child High bonding group reported significantly lower levels of family conflict than those in the other three bonding groups (unadjusted  $p = .003$ ). The lowest level of stress was found among adolescents from the Parent Low – Child High group (unadjusted  $p = .025$ ).

The overall correlation between the parent and child reports of bonding was low, whereas the correlations between the two reports within each of four bonding groups were higher (correlations 0.26, 0.30, 0.42, and 0.16, respectively). Figure 1a and 1b present boxplots of the bonding scores reported by parents and adolescents, respectively, across the parent-child bonding groups. The boxplots of the

TABLE 1  
Sample Characteristics and Measures of Interest

	Bonding Group				
	Overall	Parent-Low Child-High	Parent-High Child-High	Parent-Low Child-Low	Parent-High Child-Low
Parent	<i>n</i> = 118	<i>n</i> = 27	<i>n</i> = 26	<i>n</i> = 35	<i>n</i> = 30
Age <sup>a*</sup> (in year)					
≤40, <i>n</i> (%)	25 (21.2)	5 (18.6)	9 (34.6)	2 (5.7)	9 (30.0)
41–50	61 (51.7)	11 (40.7)	10 (38.5)	26 (74.3)	14 (46.7)
≥51	32 (27.1)	11 (40.7)	7 (26.9)	7 (20.0)	7 (23.3)
Mean ( <i>SD</i> )	48.1 (9.5)	51.0 (11.5)	46.9 (9.4)	48.5 (8.1)	46.1 (8.9)
Male <sup>a</sup> , <i>n</i> (%)	55 (46.6)	12 (44.4)	12 (46.2)	16 (45.7)	15 (50.0)
Married <sup>a</sup> , <i>n</i> (%)	92 (78.0)	20 (74.1)	24 (92.3)	25 (71.4)	23 (76.7)
Income <sup>a</sup> (in Yuan)					
<5,000	29 (24.6)	8 (29.6)	6 (23.1)	9 (25.7)	6 (20.0)
5,000–10,000	40 (33.9)	13 (48.2)	8 (30.8)	12 (34.3)	7 (23.3)
≥10,000	49 (41.5)	6 (22.2)	12 (46.1)	14 (40.0)	17 (56.7)
Education <sup>a</sup>					
None	41 (34.8)	13 (48.2)	11 (42.3)	10 (28.6)	7 (23.2)
Some	77 (65.3)	14 (51.8)	15 (57.7)	25 (71.4)	23 (76.7)
Family conflict <sup>b,**</sup>					
Mean ( <i>SD</i> )		10.2 (2.0)	8.2 (2.3)	10.3 (2.1)	9.6 (3.0)
Adolescent					
Age <sup>a</sup> (in years)					
13–15, <i>n</i> (%)	64 (54.2)	13 (48.2)	13 (50.0)	20 (57.1)	18 (60.0)
16–18	54 (45.8)	14 (51.8)	13 (50.0)	15 (42.9)	12 (40.0)
Mean ( <i>SD</i> )	15.2 (1.6)	15.4 (1.6)	15.3 (1.5)	15.1 (1.6)	15.1 (1.7)
Male <sup>a</sup> , <i>n</i> (%)	62 (52.5)	12 (44.4)	12 (46.2)	24 (68.6)	14 (46.7)
Daily stress <sup>b,*</sup>					
Mean ( <i>SD</i> )		24.9 (5.9)	27.1 (6.4)	27.0 (5.7)	28.0 (5.5)

<sup>a</sup>Chi-square test was used.

<sup>b</sup>Unadjusted model was used.

\* $p < .05$ ; \*\* $p < .01$ .

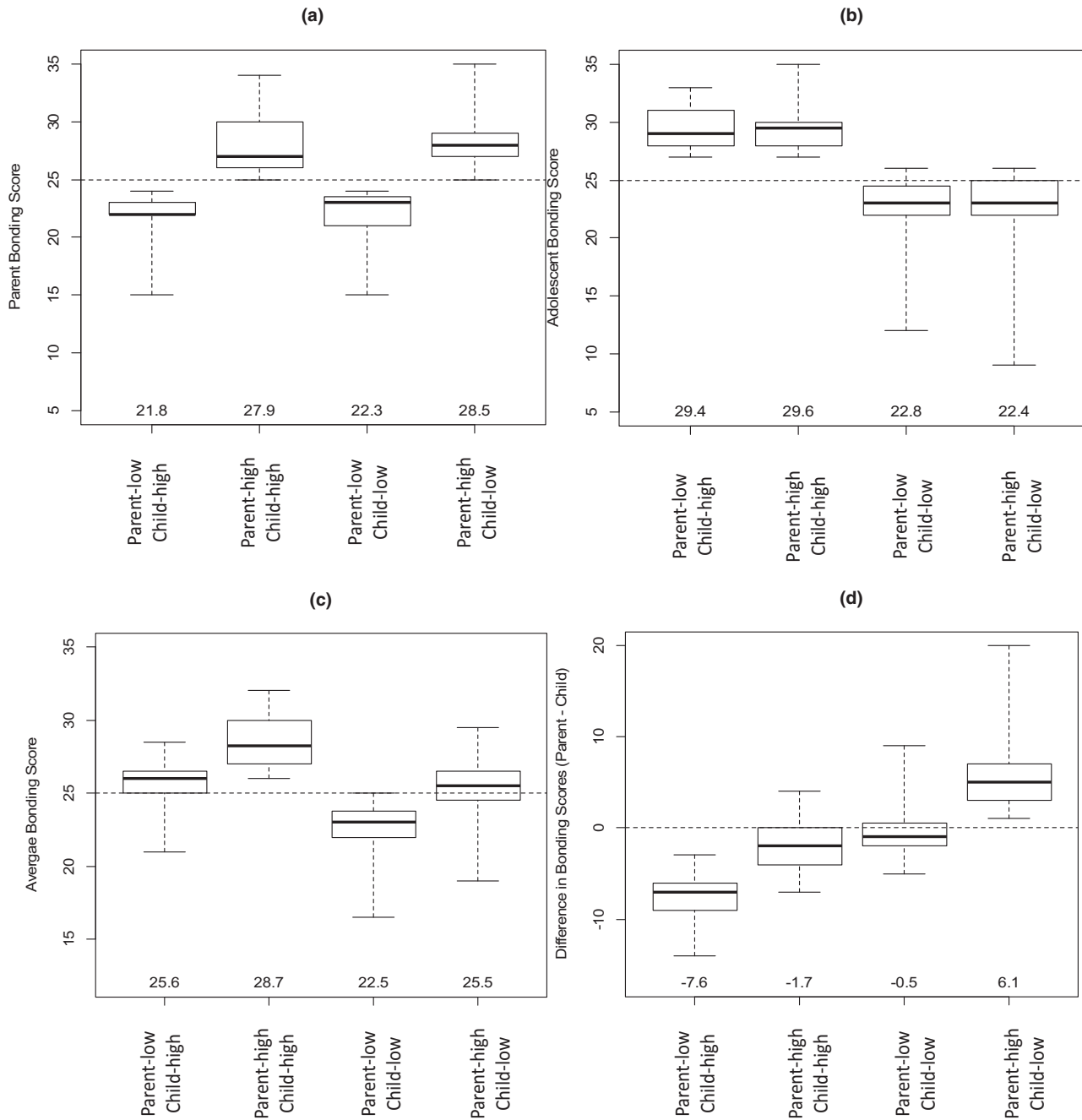


FIGURE 1 Boxplots of bonding scores reported by (a) parent and (b) adolescent and boxplots of family-level (c) average and (d) difference of parental and adolescent bonding scores across the four bonding group. The mean bonding scores reported by parent and adolescent participants are shown in (a) and (b), respectively.

average and different family-level bonding scores across the parent-child bonding groups are shown in Figure 1c and 1d, respectively. On average, parents reported greater bonding scores than their adolescent children in the Parent High – Child Low bonding group (mean = 6.10, *SD* = 4.03; see Figure 1d).

### Associations Between Family-Level Bonding Scores and Family Conflict or Daily Stress

Table 2 presents the results from the adjusted mixed-effects models with the family-level average and discrepant bonding scores for parent-reported family conflict and adolescent-reported daily stress.

TABLE 2  
Results From Mixed-Effects Models With Family-Level Bonding Measures

	Coefficient (SE)	p-Value
Parent-reported family conflict <sup>a</sup>		
Average (family-level) bonding score	-0.31 (0.07)	<.0001
Difference in bonding scores	-0.03 (0.04)	.389
Adolescent-reported daily stress <sup>b</sup>		
Average (family-level) bonding score	-0.02 (0.17)	.918
Difference in bonding scores	0.20 (0.09)	.037

<sup>a</sup>Adjusted for parental age, gender, marriage status, income, and education.

<sup>b</sup>Adjusted for child’s age and gender, and parental education.

A significant negative association was observed between family-level average bonding and parent-reported family conflict (coefficient = -0.31, SE = 0.07, *p* < .0001), whereas the discrepancy in bonding was not associated with parent-reported family conflict. However, the discrepancy in bonding was positively associated with a higher level of adolescent-reported daily stress (coefficient = .20, SE = 0.09, *p* = .037). Marriage was the only significant predictor in the parent-reported family conflict model, i.e., married parents had significantly higher levels of conflict than those who were not married (*p* = .020). None of the predictors were significantly associated with adolescent-reported daily stress.

**Associations Between Parent-Child Bonding Groups and Family Conflict or Daily Stress**

The results from the adjusted mixed-effects regression model indicated that family conflict was significantly greater in the groups with discordant reports of parental bonding (*p* = .005). Shown in Table 3, for families with their adolescents reporting high levels of bonding, a significantly greater level of family conflict was reported by parents when their own perceived bonding levels were low (difference = 2.15, SE = 0.66, *p* = .002). Parents from the Parent High – Child Low group also reported a significantly higher level of family conflict (difference = 1.80, SE = 0.65, *p* = .006). A significantly higher level of family conflict was reported in the Parent Low – Child Low group compared with families in the Parent High – Child High group (difference = 2.24, SE = 0.61, *p* = .0004). When parents reported low levels of bonding, parents had similar perceived family conflict regardless of the bonding levels reported by their adolescent children.

TABLE 3  
Results From Mixed-Effects Models With Four Bonding Groups

	Estimates (SE)	p-Value
Parent-reported family conflict <sup>a</sup>		
Parent-high, Child-high	REF	–
Parent-low, Child-high	2.15 (0.66)	.002
Parent-low, Child-low	2.24 (0.61)	.0004
Parent-high, Child-low	1.80 (0.65)	.006
Adolescent-reported daily stress <sup>b</sup>		
Parent-low, Child-high	REF	–
Parent-high, Child-high	2.19 (1.56)	.164
Parent-low, Child-low	2.79 (1.50)	.065
Parent-high, Child-low	3.23 (1.57)	.042

Note. Reference group was chosen based on the lowest mean for the measures of interest.

<sup>a</sup>Adjusted for parental age, gender, marriage status, income, and education.

<sup>b</sup>Adjusted for child’s age and gender, and parental education.

The adolescents of Parent High – Child Low families reported higher levels of stress than those of Parent Low – Child High families (difference = 3.43, SE = 1.51, *p* = .042). Adolescent-reported stress was not significantly different among the other three parent-child bonding groups.

**DISCUSSION**

Among families with a parent living with HIV or AIDS, illness progress might disrupt the parent-child relationship, which results in mental health problems in children (Murphy, Marelich, Herbeck, & Payne, 2009). Previous literature has documented the discrepancies between parent’s and child’s perception of their relationship and its related child’s behavior (Athay et al., 2012; Guion et al., 2009; de Los Reyes et al., 2010; Parker et al., 2014; Rebholz et al., 2014). The study was designed to measure whether parent-child agreement on bonding was associated with conflict or stress based on parent and adolescent reports. Our study revealed that the agreement between these sets of participants was moderate, with approximately half of the families demonstrating inconsistent bonding reports. The disagreement between parents and adolescents might reflect their different views (Waters, Stewart-Brown, & Fitzpatrick, 2003). In addition to our specific results, our study highlights the importance and benefit of combining data from both parents and adolescents to examine family situations rather than relying on single informant reports.

The current findings showed that the average family-level bonding score between adolescents and parents was related to variations in parent-reported

family conflict, which is supported by literature (Constantine, 2006). We were not surprised to find that families with low bonding reported by both parents and adolescents had the highest levels of reported family conflict, as low level of bonding reflected lack of communication between parent and child (Ehrlich, Cassidy, & Dykas, 2011; Parker et al., 2014). Interestingly, among families with discrepant bonding reports, perceived conflict was higher in families with low parent-reported bonding and high child-reported bonding, when compared with families with high parent-reported bonding and low child-reported bonding. One potential explanation might be that parent assessments of family relationships are primarily influenced by their own perceptions of bonding with their children regardless of their child's opinion. Again, these data further suggest the need to assess the perceptions of both parents and children, especially when they have different opinions.

Our study revealed that adolescent reports of stress were primarily related to their own perception of poor bonding with their parents, even when their parents reported a high level of bonding. The lowest level of stress was associated with the family group where adolescents reported high bonding with their parents and parents reported low bonding with their children. This is to say, child-reported stress is primarily associated with children's perceived poor bonding with their parents regardless of their parents' reports. This finding indicates that, despite a deliberate distancing from parents, adolescents continue to seek consolation from parental bonding to ease stresses (Barbot, Heinz, & Luthar, 2014). The lack of association between parent-reported bonding and child-reported stress might suggest that, in a family with problems (family impacted by HIV or AIDS in this case), parents tend to be less sensitive to their child's mental health needs (Thompson et al., 2007). Therefore, when studying children's mental health, careful assessments of family relationships and multidimensional investigations of children's mental health indicators are warranted. Parental evaluation could supplement but should not be substituted for child report.

The cross-sectional data used in this study limited our ability to assess temporal relationships among parent-child bonding, family conflict, and child stress. Furthermore, we chose the parent and child medians as the paired cutoff values to ensure a reasonable sample size for each bonding group. Because the overall sample size was moderate, the size of each group would have been too small had

we constructed more bonding groups. Using paired cutoff values was not an ideal choice; however, it enabled us to explore the associations of interest in this study. The Cronbach's alpha score for some of the measures, e.g., family functioning scale, was relatively low. A stronger scale could have potentially improved the validity of the study findings. Finally, although we observed bonding group differences related to parent-reported family conflict and child-reported stress, we acknowledged that the magnitudes of these differences were small, and caution must be exercised when discussing the practical significance of these findings.

Nevertheless, our findings highlight the importance of examining responses from both parents and children when studying issues related to family well-being. This methodology is relevant not only regarding families affected by HIV but also those affected by other chronic illnesses or mental health challenges. Familial reactions to these challenges can result in changes in familial roles; for instance, adolescents might take on more family responsibilities at an early age. These changes can potentially affect perceptions of parental bonding, strain family relationships, and increase distress among family members. Future studies in this area should explore issues such as the role of comorbid mental health conditions, the influence of children's perceived parental care on later mental health, and the relationship between child age and the level of child-parent agreement. Continued investigations might help to tailor intervention components based on various family situations and relationship patterns to empower families regarding program development.

## IMPLICATIONS AND CONTRIBUTION

This study examined both parents' and adolescents' reports regarding bonding within HIV-affected families and assessed their relationship with parent-reported family conflicts and adolescent-reported stress. Findings highlight the importance and benefit of combining data from both parents and adolescents to examine family situations rather than relying on single-informant reports.

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