

# Parental HIV/AIDS and Psychosocial Adjustment among Rural Chinese Children

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**Objective** To assess the relationship between parental HIV/AIDS and psychosocial adjustment of children in rural central China. **Methods** Participants included 296 double AIDS orphans (children who had lost both their parents to AIDS), 459 single orphans (children who had lost one parent to AIDS), 466 vulnerable children who lived with HIV-infected parents, and 404 comparison children who did not experience HIV/AIDS-related illness and death in their families. The measures included depressive symptoms, loneliness, self-esteem, future expectations, hopefulness about the future, and perceived control over the future. **Results** AIDS orphans and vulnerable children consistently demonstrated poorer psychosocial adjustment than comparison children in the same community. The level of psychosocial adjustment was similar between single orphans and double orphans, but differed by care arrangement among double orphans. **Conclusion** The findings underscore the urgency and importance of culturally and developmentally appropriate intervention efforts targeting psychosocial problems among children affected by AIDS and call for more exploration of risk and resilience factors, both individual and contextual, affecting the psychosocial wellbeing of these children.

**Key words** care arrangement; China; HIV/AIDS; orphans; psychosocial adjustment; vulnerable children.

## Introduction

The death of a parent during childhood is traumatic, with a profound and potentially lasting impact on a child's psychosocial wellbeing (Li et al., 2008). In addition to the developmental vulnerability normally faced by any child whose parents have died, experience with parental illness and death due to AIDS may create additional cognitive and social challenges. These challenges may further aggravate the grieving process among children who have lost parents or who face the potential of losing parents to HIV/AIDS, and may increase risk for psychological problems. In just 2 years, from 2001 to 2003, globally the number of children orphaned by AIDS (i.e., lost one or both parents to AIDS) increased from 11.5 million to 15 million (UNICEF, 2004). By 2003, the number of children orphaned by HIV/AIDS worldwide was estimated at 15 million, of whom 12.3 million were living in sub-Saharan Africa (UNICEF, 2004). The age distribution of orphans

was fairly consistent across countries, with ~12% of orphans being 0–5 years old, 33% being 6–11 years old, and 55% being 12–17 years old. UNAIDS and UNICEF estimated that, based on the current trends, the number of AIDS orphans could reach 25 million by 2010 and 40 million by 2020 (Phiri & Webb, 2005; UNICEF, 2004).

Both qualitative and quantitative data from American and sub-Saharan African countries suggest that AIDS orphans (i.e., children who have lost one or both parents to HIV/AIDS) and vulnerable children (i.e., children living with HIV-infected parents) suffer psychological symptoms such as depression, anxiety, fear, anger, loneliness, social withdrawal, and hopelessness (Cluver & Gardner, 2007; Cluver, Gardner, & Operario, 2007; Rotheram-Borus, Weiss, Alber, & Lester, 2005; Sengendo & Nambi, 1997; Woodring, Cancelli, Ponterotto, & Keitel, 2005). These symptoms vary in type and severity, but a common theme runs through many of these studies to

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suggest that negative psychological symptoms arise at the onset of parental diagnosis and persist after the parent's death (please see Cluver & Gardner, 2007 for a comprehensive review). However, it is widely acknowledged in the literature that the psychological health of children orphaned by HIV/AIDS has been under-investigated (Cluver & Gardner, 2007; Li et al., 2008). In addition, the geographic locations of the existing studies are disproportionately concentrated in inner cities of America and rural towns in sub-Saharan Africa. The condition of AIDS orphans in Asian countries has received little attention despite the rapid growth of the AIDS epidemic in many Asian nations and regions including China, which has experienced a rapid progression of the AIDS epidemic in the last two decades (Zhao et al., 2007).

The China Ministry of Health estimated that there were at least 100,000 AIDS orphans in China by the end of 2004 (Zhao et al., 2007). Many of the identified AIDS orphans live in Henan Province, an agricultural province in central China with a population of 96.66 million. The HIV/AIDS epidemic in remote areas of Hunan is believed to have originated in the 1980s due to the practice of selling blood for additional income by the farmers to governmental and commercial blood stations/centers in the region. The commercial collection centers pooled the blood of several donors of the same blood type, separated the plasma, and injected the remaining red-blood cells back into individual donors to prevent anemia. Such practices, along with the reusing of needles and contaminated equipment, contributed to the rapid spread of the virus through the local population.

Although many HIV-infected individuals in Henan Province and other HIV-epicenters in China progressed to AIDS and subsequently died, leaving their children orphaned (Ji, Li, Lin, & Sun, 2007; Yang et al., 2006; Zhao et al., 2007), studies regarding the psychosocial adjustment of AIDS orphans and vulnerable children in China are limited. In an attempt to further our understanding of this outcome, we have developed a developmental psychopathology framework (Figure 1) hypothesizing factors leading to the psychosocial wellbeing of children orphaned or made vulnerable by AIDS (Li et al., 2008).

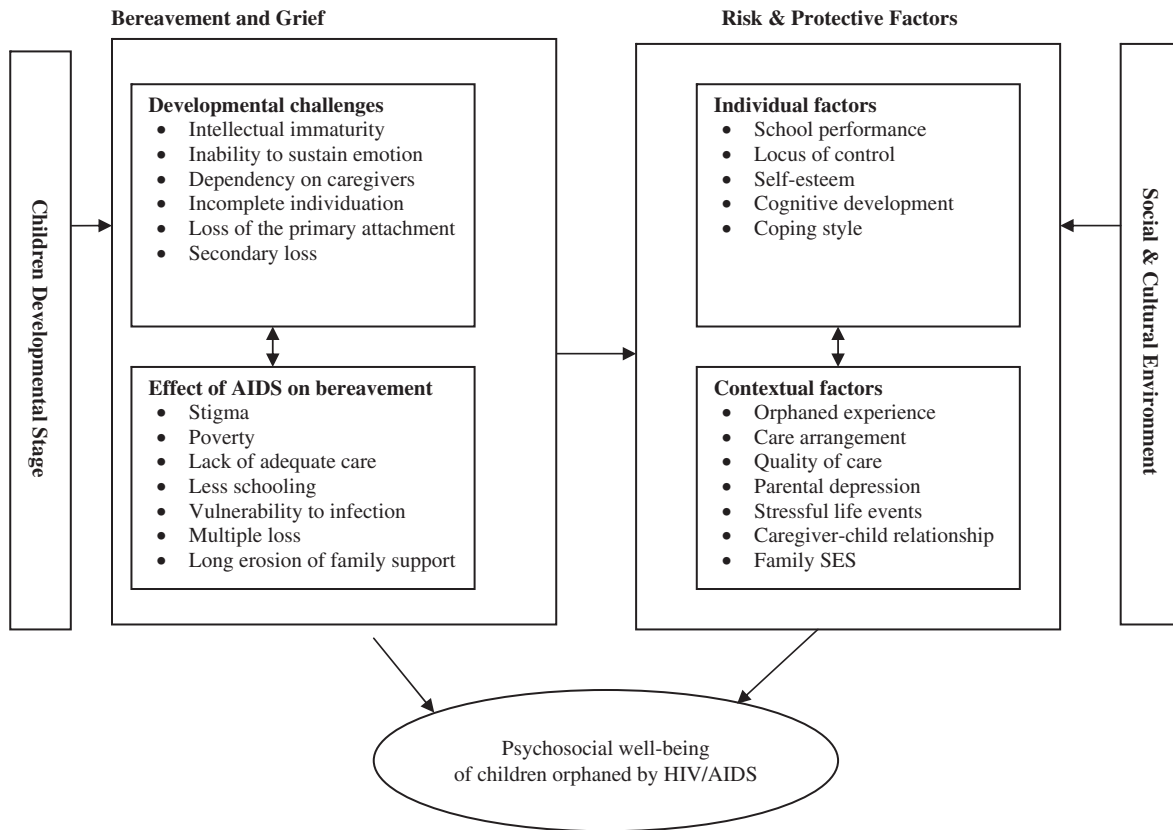
Culture is likely to influence bereavement and grief experience among children. The Chinese view of death and grief is largely rooted in the traditional Chinese collectivist culture, taking the perspective of the group (e.g., family, community, society) rather than the individual (Nisbett, 2003). While this greater collectivism might protect Chinese children from the increased risk for trauma exposure observed among children in Western culture, there are certain aspects of the Chinese culture that may

exacerbate the trauma of parental loss. These aspects include the greater emphasis in Chinese culture on interdependence, cultural expectation for children to control emotions that are considered to be adverse or disruptive to harmonious social interaction, social disapproval of any excessive expression of grief and mourning, and cultural norms against adoption of orphans by non-family members (Tseng & Wu, 1985; Zhao et al., 2007).

In addition to the general cultural and value orientation of Chinese population, some local characteristics of the AIDS epidemic could also impact the child's psychosocial wellbeing. One such characteristic is the mode of HIV transmission in central China, where the primary cause of AIDS is poverty-driven blood donation/transfusion. The high prevalence of HIV infection in this area due to such a mode of transmission could increase community tolerance of persons with HIV/AIDS and hence place less stigma on these individuals and on the children in their families, as compared with persons acquiring HIV through sex or intravenous drug use. In such instances of lower stigma, children could feel less isolated and distressed. On the other hand, it is equally possible that being from a village with a high rate of distress due to AIDS-related illness and death could heighten the risk of distress among these children.

In addition, the care arrangement for AIDS orphan in China may also affect their psychosocial adjustment. While the extended family (or kinship) care and community-based orphan care are the dominant strategies for orphan care in many African countries (Abebe & Aase, 2007), China government has recently developed orphanages and small group homes as alternatives in response to increasing numbers of double orphans (West & Wedgwood, 2006). Small group homes are usually managed by local residents who serve as "house parents" for a small number (four to six) of orphans in family style (e.g., the orphans would refer to house parents as "father" and "mother" and to each other as brothers or sisters). A previous study in China has suggested that children living in small group homes perceived better life improvement and reported greater life satisfaction than AIDS orphans living in AIDS orphanages or kinship care (Zhao et al., *in press*). Therefore, it is important to examine the impact of AIDS on the psychosocial wellbeing of Chinese children under these unique cultural influences and care arrangements.

Guided by the conceptual framework (Figure 1), we assembled an array of scales designed to explore each of the putatively important constructs illustrated. Given the complexity of the process leading to the psychosocial outcomes of orphans and vulnerable children and therefore



**Figure 1.** Developmental psychopathology framework of psychosocial needs of children affected by HIV/AIDS, adapted from Li et al. (2008)

the size of the data required to develop a robust framework for understanding, we explored clusters of these data in a series of manuscripts. In this manuscript, we assess the psychosocial functioning (e.g., adjustment) of these children based on parent status (died of AIDS, alive living with HIV/AIDS, and alive without AIDS or known HIV infection). Future reports from this dataset will explore the developmental stage of these children, their bereavement and grief experience, and putative risk and protective factors.

Accordingly, the current study, utilizing the baseline data from a longitudinal assessment of psychosocial needs of children orphaned or made vulnerable by HIV/AIDS (i.e., facing the potential of losing a parent to AIDS), was designed to compare the psychosocial adjustment of AIDS orphans and vulnerable children with comparison children from the same community. In addition, we explored the differences of psychosocial adjustment between single orphans (children who lost one of their parents to AIDS) and double orphans (children who lost both of their parents to AIDS) as well as the differences by care arrangement (i.e., orphanage, kinship care, and group homes) among double orphans. We hypothesized that AIDS orphans and vulnerable children would have higher levels

of psychological problems (e.g., depression, loneliness) and lower levels of psychosocial wellbeing (e.g., self-esteem, positive future orientation) than comparison children. We also hypothesized that care arrangements for double orphans would be associated with children's psychosocial adjustment, with double orphans in government-supported care settings (e.g., AIDS orphanage and small group homes) demonstrating higher psychological functioning relative to double orphans in kinship care.

## Methods

### Study Site

The current study was conducted in 2006–2007 in two rural counties in central China where many residents had been infected with HIV through unhygienic blood collection practices in the late 1980s and early 1990s. Both counties are rural (with  $\geq 94\%$  of their population being rural residents) with similar demographic and economic profiles. Although accurate epidemiological data are lacking, both counties are generally believed to have the highest prevalence of HIV infection in central China (Agence France Presse, 2004). We obtained village-level HIV

surveillance data from the anti-epidemic stations of each county to identify the villages with the highest number of individual deaths of HIV/AIDS or with confirmed HIV infection. The participants in the current study were recruited primarily from five administrative villages (rural administrative units under the county) that had jurisdiction over 111 natural villages.

### **Participants**

The participants in the current study include 296 double orphans (i.e., children who lost both parents to AIDS), 459 single orphans (i.e., children who lost one parent to AIDS), 466 vulnerable children (i.e., children living with HIV-infected, alive parents), and 404 comparison children who were from the same community and did not have HIV/AIDS-related illness or death in their families. Children 6–18 years of age were eligible to participate in the study. Age eligibility was verified through the local community leaders, school records, or caregivers. Children with HIV-infection were eligible to participate, although the number of such children was estimated to be very small and no HIV testing was conducted in the current study.

### **Sampling Procedure**

The recruitment process for the current study has been described in detail elsewhere (Li et al., in press). Briefly, the orphanage sample was recruited from four government-funded orphanages ( $n = 176$ ) and eight community-based small group homes ( $n = 30$ ). The participation rates of the orphanage sample and the small group home sample were 72% and 70%, respectively. The remaining orphans ( $n = 549$ ) and vulnerable children ( $n = 466$ ) were recruited from the family or extended family (i.e., kinship) care settings. We worked with the village leaders to generate lists of families caring for orphans and of families with confirmed diagnosis of parental HIV/AIDS. We approached these families and recruited one child per family to participate in the assessment. If a child in a selected family was not available to participate, the next family on the list was selected. This process was repeated until the target sample size for the AIDS orphans and vulnerable children (i.e., about 1,200) was achieved. A similar approach was employed to recruit the comparison children (with a target sample size of 400) from the same villages where the orphans and vulnerable children were recruited. When there were siblings in an orphanage, group home, or household, one child only was randomly selected. The research protocol, including the consenting process, was approved by the institutional review boards at both Wayne

State University in the United States and Beijing Normal University in China.

### **Survey Procedure**

Each child participating in the study completed an assessment survey in Chinese. The survey includes detailed measures of demographic information and several scales of psychosocial adjustment. During the survey, necessary clarification or instruction was provided promptly when requested. The entire assessment inventory took about 75–90 min, depending on the age of the child. Younger children (e.g., those  $\leq 8$  years old) were offered a 10–15 min break after every 30 min of assessment. Each child received a gift at completion of the assessment as a token of appreciation.

### **Translation of the Measurement Scales into Chinese**

Some psychosocial scales were available only in English and were translated into Chinese in the current study. The initial translation of these scales from English to Chinese was performed by English–Chinese bilingual research team members. The Chinese translation was reviewed by a group of psychology and education faculty and students in China to ensure its cultural and developmental appropriateness for children in China. The Chinese translation was finalized based on feedback from the Chinese faculty and students. All measures were then translated back into English to examine whether the meaning of items had changed or been lost in the translation process. Items that appeared to have changed in meaning were then adjusted until the meaning met with the research team's intentions.

The translated scales were pilot-tested prior to the field data collection (along with other scales in our assessment inventory) to examine reactions of Chinese children to the items and their understanding of the measures. The pilot-testing sample ranged from 7 to 16 years of age and included both boys and girls. Following the pilot-testing, no substantive changes, but several minor modifications were made to improve the comprehensibility of items among younger children (e.g., those  $< 10$  years of age).

### **Measures**

#### **Demographic Characteristics**

Children were asked to provide information regarding their age, sex, ethnicity, perceived health status (very good, good, fair, and poor), parental education (no schooling, elementary school, middle school, high school or more), and the main occupational activities in which their parents were currently engaged or had been engaged before their

death (farming, migrant worker, local small merchant, or other). Following general recommendations in the global literature on measuring socioeconomic status (SES) in health disparities research (Shavers, 2007), we created a composite score to estimate children's family SES by indexing those children whose parents (father and mother) had greater than elementary school education and engaged in non-farming occupational activities. The SES score had a range of 0–4 with a high score indicating a high family SES. Missing data on any of the four SES items were allowed during the calculation of the composite score.

### Depression

Children's depressive symptoms were measured using the Center for Epidemiological Studies Depression Scale for Children (CES-DC; Fendrich, Weissman, & Warner, 1990). The CES-DC is a 20-item self-report depression measure with a 4-point response option (i.e., 0 = not at all, 1 = a little, 2 = some, 3 = a lot). The CES-DC was translated into Chinese in the early 1990s and was validated with various Chinese populations (Wang, 1993). However, this instrument did not have normed data or criterion score for clinical significance for Chinese children. Cronbach's  $\alpha$  of the scale was .81 for the current study sample.

### Loneliness and Social Dissatisfaction

The Chinese version of the Children's Loneliness Scale (CLS; Asher, Hymel, & Renshaw, 1984; Wang, 1993) was administered to the children in the current study. The CLS consists of 24 items, 16 of which assess children perceived loneliness and social dissatisfaction and the other eight items served as the "filler items" that focus on children's hobbies and other activities. The filler items were designed to help children relax while completing the scale (Asher et al., 1984). The CLS items have a 5-point response option ranging from "Not true at all" to "Always true". The 16 loneliness items have a good internal consistency (Cronbach's  $\alpha = .82$ ) for the current study sample. No normed data of CLS were available for Chinese children.

### Self-Esteem

The participants were also asked about their global feelings of self-worth or self-acceptance using the 10-item Self-Esteem Scale with a 4-point response option (i.e., strongly disagree to strongly agree) (Rosenberg, 1965). The Self-Esteem Scale was introduced into China more than a decade ago (Wang, 1993). However, no normed data for Chinese children were available. The scale has a Cronbach's  $\alpha$  of .64 for the current study sample.

### Future Expectation (Future)

Children were asked to complete a modified version of the Children Future Expectation Scale (Bryan, Rocheleau, Robbins, & Hutchison, 2005). This modified version consists of six items assessing expectations about specific future outcomes in life (e.g., handling problems in life, handling school work, having friends, staying out of trouble, having a happy life, having interesting things to do). Children were asked to indicate along a 5-point scale (1 = "not at all" to 5 = "very much") how sure they were that these positive outcomes would actually occur in the future. This scale demonstrated a good internal consistency for the current study sample (Cronbach's  $\alpha = .84$ ).

### Hopefulness About Future (Hope)

A 4-item scale used in a previous study (Whitaker, Miller, & Clark, 2000) was employed to assess child's hopefulness with regard to some concrete outcomes in the future (e.g., "How likely do you think you are to graduate from high school some day?"). The items in the scale have a 4-point response option ranging from 1 = "will not happen" to 4 = "will definitely happen". Cronbach's  $\alpha$  for the scale was .74 for the current study sample.

### Perceived Control Over the Future (Control)

A 7-item personality-based/dispositional measure (Whitaker et al., 2000) was employed to assess child's perceived control over the future (e.g., "What happens to me in the future mostly depends on me"). The children indicated the degree of their agreement to each of the statements with a 4-point response option ranging from 1 = "disagree a lot" to 4 = "agree a lot". The seven items have a Cronbach's  $\alpha$  of .64 for the current study sample.

### Statistical Analysis

First, analysis of variance (ANOVA) was employed to compare scores of the psychosocial scales between single orphans and double orphans. A mean score (with appropriate reverse recoding) was employed as scale score for each of the six psychosocial measures with higher scores indicating higher levels of perception/attribute that the scale was designed to measure. Because there were no statistically significant differences between single orphans and double orphans on any of the psychosocial measures, the two orphan groups were combined into a single group (i.e., AIDS orphans) in subsequent analyses. Second, ANOVA (for continuous measures) or chi-squared test (for categorical measures) was performed to examine the difference of sample characteristics among the three groups of children (AIDS orphans, vulnerable children, and comparison children). Third, ANOVA was performed to assess the group

differences of psychosocial adjustment among double orphans by care arrangement (AIDS orphanage, kinship care, group home). Estimated marginal means (i.e., adjusted means) obtained through general linear model (GLM) procedure controlling for children's sex, age, and family SES were employed in all group comparisons. For variables with more than two groups (i.e., main group variable and care arrangement), post hoc multiple comparisons based on adjusted means were conducted to identify the pair-wise differences using the one-way ANOVA with the criterion of the least significant difference.

Finally, two multivariate analyses using GLM procedure were performed to test the main effects of the children groups (Model One) and of the care arrangements (Model Two) on psychosocial adjustment. Because of the potential association of children's sex, age, and family SES with their psychosocial wellbeing, these variables were controlled in the GLM analysis. The child sex (a categorical variable) was used as an additional factor variable in the GLM analyses. The child age and family SES (continuous measures) were included in both GLM models as covariates. All psychosocial measures were employed as dependent variables in the GLM analyses. All analyses were conducted using SPSS for Windows V.16.

## Results

### Sample Characteristics

The sample in the current study consisted of 826 boys (51%) and 799 girls (49%). The mean age was 12.85 years ( $SD = 2.21$ ) and did not differ between boys and girls (12.89,  $SD = 2.20$  vs. 12.82,  $SD = 2.23$ ). Ninety-nine percent of the children were of Han ethnicity. Two-thirds of the children in the sample considered themselves as being "very good" or "good" in health. The majority of the children sampled (>70%) reported that their father or mother had no more than middle-school education. About

one-fifth of the children did not know the educational attainment of their parents. The majority of the parents (66% fathers and 81% mothers) worked mainly in farming or worked in cities as rural migrant workers.

There were a number of significant differences in demographic characteristics among the three groups. Orphans were older (mean = 13.16,  $SD = 2.20$ ) than either vulnerable children (mean = 12.36,  $SD = 2.24$ ) or the comparison children (mean = 12.83,  $SD = 2.11$ ) ( $F[2,1613] = 19.24$ ,  $p < .0001$ ). The proportion of children who did not know their parental education attainment was significantly higher among AIDS orphans (24% for father and 29% for mother) than vulnerable children (14% for each parent) or comparison children (6% for father and 13% for mother) [ $\chi^2(8) = 52.27$ ,  $p < .0001$  for father;  $\chi^2(8) = 77.66$ ,  $p < .0001$  for mother]. More orphans or vulnerable children reported that their parents mainly engaged in farming than comparison children [i.e., 80% and 75% vs. 67%,  $\chi^2(6) = 70.77$ ,  $p < .0001$  for father; 65% and 58% vs. 41%,  $\chi^2(6) = 39.79$ ,  $p < .0001$  for mother].

### Preliminary Analysis

There were significant group differences in all psychosocial measures among AIDS orphans, vulnerable children, and comparison children (Table I). Compared with comparison children, AIDS orphans or vulnerable children scored significantly higher on depression ( $F[2,1576] = 39.12$ ,  $p < .0001$ ) and loneliness ( $F[2,1576] = 48.23$ ,  $p < .0001$ ), and scored significantly lower on self-esteem ( $F[2, 1576] = 20.22$ ,  $p < .0001$ ), positive future expectations ( $F[2, 1576] = 3.26$ ,  $p < .05$ ), hopefulness about future ( $F[2, 1576] = 15.33$ ,  $p < .0001$ ), and perceived control over future ( $F[2, 1576] = 9.63$ ,  $p < .0001$ ). Table I also depicts the findings of the post-hoc pair-wise comparisons based on the estimated marginal means obtained through general linear model controlling for children sex, age, and family SES. While AIDS orphans reported higher scores

**Table I.** Adjusted Mean (95% Confidence Interval) of Psychosocial Measures Among Three Groups of Children ( $n = 1,625$ )<sup>a</sup>

	AIDS orphans (1)	Vulnerable children (2)	Comparison children (3)	Post hoc comparison <sup>b</sup>
N (%)	755 (46%)	466 (29%)	404 (25%)	n/a
Depression	1.02 (0.99, 1.05)	0.88 (0.85, 0.92)	0.80 (0.76, 0.84)**	(1, 2) (1, 3) (2, 3)
Loneliness	2.47 (2.42, 2.52)	2.60 (2.53, 2.66)	2.15 (2.08, 2.22)**	(1, 2) (1, 3) (2, 3)
Self-Esteem	2.87 (2.84, 2.90)	2.79 (2.75, 2.83)	2.97 (2.93, 3.01)**	(1, 2) (1, 3) (2, 3)
Future	3.06 (2.99, 3.12)	2.99 (2.91, 3.08)	3.15 (3.06, 3.24)*	(2, 3)
Hope	2.83 (2.78, 2.88)	2.75 (2.68, 2.82)	3.01 (2.94, 3.08)**	(1, 3) (2, 3)
Control	2.97 (2.94, 3.01)	2.93 (2.88, 2.98)	3.08 (3.03, 3.14)**	(1, 3) (2, 3)

<sup>a</sup>Estimated marginal means obtained through general linear model controlling for children's sex, age and family SES.

<sup>b</sup>Pairs with significant difference ( $p < .05$ ) are listed.

\* $p < .05$ ; \*\* $p < .0001$ .

than vulnerable children on depression, vulnerable children reported poorer psychosocial adjustment than AIDS orphans in loneliness and self-esteem.

Among double orphans, care arrangement (i.e., orphanage, kinship care, group home) was significantly associated with depression ( $F[2,285] = 5.99, p < .01$ ), loneliness ( $F[2,285] = 3.24, p < .05$ ), self-esteem ( $F[2,285] = 15.36, p < .0001$ ), future expectations ( $F[2,285] = 3.33, p < .05$ ), hopefulness about future ( $F[2,285] = 4.41, p < .05$ ), and perceived control over the future ( $F[2,285] = 10.89, p < .0001$ ) (Table II). Findings of post hoc pair-wise comparisons are shown in Table II. Double orphans living in group homes reported lower depression scores, higher perceived control over

their future, but higher loneliness and lower self-esteem than those living in either orphanages or kinship care. Double orphans in orphanages scored higher in future expectations and hopefulness about their future than children in kinship care.

**Multivariate Analysis**

In the GLM analysis among the entire sample (Model One), children’s group membership showed multivariate ( $F[12,3144] = 15.32, p < .0001$ ) and univariate significance for all psychosocial measures (Table III). The sex of the child demonstrated a significant multivariate effect on psychosocial variables ( $F[6,1571] = 2.21, p < .05$ ); however, no univariate effects were found. The interaction

**Table II.** Adjusted Mean (95% Confidence Interval) of Psychosocial Measures by Care Arrangement for Children Who Were Double Orphaned by AIDS<sup>a</sup>

	Care arrangement			Post hoc comparison <sup>b</sup>
	AIDS orphanage (1)	Kinship care (2)	Group home (3)	
N (%)	176 (59%)	90 (30%)	30 (10%)	n/a
Depression	1.02 (0.95, 1.09)	1.05 (0.96, 1.14)	0.72 (0.55, 0.89)**	(1, 3) (2, 3)
Loneliness	2.37 (2.35, 2.49)	2.52 (2.35, 2.67)	2.74 (2.46, 3.03)*	(1, 3)
Self-esteem	2.90 (2.82, 2.97)	2.83 (2.74, 2.93)	2.37 (2.19, 2.54)***	(1, 3) (2, 3)
Future	3.27 (3.13, 3.41)	2.97 (2.77, 3.16)	3.02 (2.67, 3.37)*	(1, 2)
Hope	2.95 (2.83, 3.07)	2.68 (2.51, 2.84)	2.65 (2.36, 2.94)*	(1, 2)
Control	3.01 (2.89, 3.12)	2.83 (2.76, 2.99)	3.60 (3.31, 3.88)***	(1, 3) (2, 3)

<sup>a</sup>Estimated marginal means obtained through general linear model controlling for children’s sex, age and family SES.

<sup>b</sup>Pairs with significant difference ( $p < .05$ ) are listed.

\* $p < .05$ ; \*\* $p < .01$ ; \*\*\* $p < .0001$ .

**Table III.** Results of Two General Linear Model Analyses

	Main effect		Interaction G by S	Covariate	
	Group (G)	Sex (S)		Age	SES
Model 1: Entire sample by children group (orphans, vulnerable children, and comparison children)					
Multivariate <sup>a</sup>	15.35****	2.23*	<1	19.56****	3.10**
Depression	39.14****	<1	<1	<1	<1
Loneliness	48.23****	1.63	1.12	40.11****	1.08
Self-esteem	20.22****	<1	1.08	15.28****	1.03
Future	3.26*	1.88	<1	26.40****	3.48
Hope	15.33****	3.22	<1	10.15***	3.55
Control	9.67****	1.97	<1	80.72****	2.04
Model 2: Double orphans by care arrangement (orphanage, kinship care, and group homes)					
Multivariate	6.38****	3.93***	2.73***	4.46****	<1
Depression	5.41**	<1	1.35	<1	<1
Loneliness	3.24*	<1	<1	12.96****	<1
Self-esteem	15.36****	6.56*	3.90*	5.73*	<1
Future	3.33*	<1	<1	3.04	<1
Hope	4.41*	3.56	2.34	8.26**	<1
Control	10.89****	12.24***	9.07****	11.67***	<1

<sup>a</sup>Pillai’s Trace  $F$  statistics were presented in the table for multivariate test and conventional  $F$  statistics (based on Type III Sum of Square) were presented for univariate tests.

\* $p < .05$ ; \*\* $p < .01$ ; \*\*\* $p < .001$ ; \*\*\*\* $p < .0001$ .

term between the main group variable and the child's sex showed neither multivariate nor univariate significance in the model. The age of the child was a significant covariate within the multivariate model ( $F[6,1571] = 19.52$ ,  $p < .0001$ ) and with all but one univariate test (depression). Children older in age reported lower loneliness, higher self-esteem, positive future expectation, higher hopefulness, and higher perceived control over the future. Family SES was a significant covariate in only the multivariate test ( $F[6,1571] = 3.10$ ,  $p < .01$ ).

In the GLM analysis among double orphans (Model Two), the care arrangement showed multivariate significance ( $F[12,546] = 6.28$ ,  $p < .0001$ ) as well as univariate significance for all psychosocial measures (the second half of Table III). Besides its multivariate significance ( $F[6,272] = 3.91$ ,  $p < .001$ ), the sex of the child was significantly related to self-esteem ( $F[1,277] = 6.56$ ,  $p < .05$ ) and perceived control over the future ( $F[1,277] = 12.24$ ,  $p < .001$ ) with boys scoring higher than girls in self-esteem (2.79 vs. 2.61) but lower in perceived control over the future (2.94 vs. 3.35). The age of the child was a significant covariate for multivariate test ( $F[6,272] = 4.50$ ,  $p < .0001$ ) and for all the univariate tests except depression and future expectation. Family SES was a significant covariate for neither multivariate test nor univariate test. There was an interaction between care arrangement and the child's sex for self-esteem ( $F[2,277] = 3.90$ ,  $p < .05$ ) and perceived control over the future ( $F[2,277] = 9.07$ ,  $p < .0001$ ). Further examinations of cell means revealed that both significant interaction effects resulted from the differences between boys and girls from group homes. While boys and girls from other care arrangements (i.e., AIDS orphanages and kinship care) reported similar levels of self-esteem and perceived control over the future, there was a significant sex difference in self-esteem and perceived control over the future among children at group homes with boys reporting higher self-esteem (mean score 2.65 vs. 2.17) but lower perceived control over the future (mean score 3.00 vs. 3.97) than girls.

## Discussion

The data from this study of children in rural China are consistent with the global literature which indicates that children either orphaned or made vulnerable by AIDS appear to have poorer psychosocial adjustment compared to children who do not experience HIV/AIDS in their family (Cluver & Gardner, 2007). The current study found that vulnerable children (e.g., children who faced the potential of losing parents infected with HIV/AIDS)

were at the same or higher risk as AIDS orphans for poor psychosocial adjustment, suggesting that children living with HIV-infected parents are at particular risk of psychological stress. The context in which these children live (e.g., uncertainty regarding parent health status or death, being potentially isolated from others due to parental AIDS-related illness) may contribute to such stress.

Based on a common belief that psychological trauma associated with the loss of both parents may be greater than that with the loss of a single parent, many of the existing AIDS relief efforts (such as those in China) pay more attention to double orphans than single orphans (Zhao et al., in press). However, in this study no significant differences were found in either the rates or in the severity of psychological problems between double orphans and single orphans who were living with their surviving parent. This finding suggests that both double and single orphans are at risk of mental health problems and that having a surviving parent may not necessarily be an adequate shield for psychosocial problems associated with losing one parent to AIDS.

In general, children living in small group homes reported better psychosocial adjustment than those living in either orphanages or kinship care. This finding suggests that group homes might be a more adaptive environment than AIDS orphanages and kinship households. In group homes, children live in a small group with their "parents" and "siblings" in an atmosphere of "a family" in their own communities. By contrast, the orphanage's centralized care model and the separation of children from their original communities might cause social isolation and distress among children (West & Wedgwood, 2006). The low child-to-caregiver ratio in group homes, compared to that in orphanages, may be another factor contributing to the better mental health status among children in group homes (Zhao et al., in press). The difference between small group homes and kinship households may be due to a larger degree of unmet basic needs in kinship households. Although children in kinship households were also entitled to financial support from local governments, such support might not be used directly for the orphans (Ji et al., 2007; Zhao et al., in press). However, the finding that double orphans in group homes showed lower self-esteem than those living in either orphanages or kinship care did not support our initial hypothesis regarding the direction of the difference by care arrangement. Future studies are needed to explore the contextual factors and care-giving practices associated with various care arrangements that may potentially moderate or mitigate the effect of parental death on children's psychosocial adjustment (Li et al., 2008).



There are several potential limitations in the current study. First, the representativeness of our samples may be limited for several reasons. Our samples were recruited from one of the AIDS epicenters in China with a unique cause of parental HIV/AIDS (i.e., unhygienic blood collection) and dominant Han ethnicity composition. The HIV/AIDS epidemic in China also contains several other modes of viral transmission (e.g., sex, intravenous drug use, and mother-to-child). In addition, HIV/AIDS has disproportionately affected ethnic minorities in other areas of China. Therefore, future studies need to involve children from other ethnic backgrounds and also with different causes of parental HIV/AIDS infections in order to validate the findings in the current study. Second, some psychological scales in the current study had relatively low reliability estimates (e.g., Cronbach's  $\alpha = .64$  for self-esteem and perceived control over future). Future studies are needed to develop reliable measures that are culturally and developmentally appropriate for rural Chinese children. Third, children living with HIV were eligible to participate in this study. However, we do not know the number of HIV-infected children in our study sample. Finally, the composite family SES score used in the current study has not been validated for rural Chinese children, although the development of such a score followed the general recommendations in the global literature on measuring SES in health disparities research (Shavers, 2007). In addition, the family SES composite score in the current study could be potentially biased because of the large proportion of missing data on the measures of parental education attainment.

Despite these potential limitations, the current study is one of the first efforts to assess the psychosocial problems among children orphaned or made vulnerable by AIDS in China. Such psychosocial adjustment problems among children affected by AIDS could result from unmet basic needs, stressful living environment, and developmental challenges such as those identified in the proposed psychopathology framework (Figure 1). Clearly, losing a parent or facing the potential of losing parents to HIV/AIDS are significant risk factors for difficulties in child and adolescent adjustment. However, despite these and other substantial risks suffered by the children in this study, there was also ample evidence that many of the orphaned children in this study did not report elevated levels of mental health problems. Significant research has documented the tremendous resilience most children show in the face of stress (Cicchetti & Curtis, 2007). Future studies are needed to explore the putative risk and resilience factors affecting psychosocial wellbeing of these children, especially key protective factors that help to buffer children from the detrimental effects of the

stresses associated with having a family member(s) with HIV/AIDS. Future studies are also needed to examine cultural factors that may influence children's bereavement and grief. The findings in the current study suggest the need for culturally and developmentally appropriate intervention efforts (such as group therapy or individual counseling focused on grief processing or adaptive coping skills) for these children. The data in the current study also underscore the overall importance of research and clinical intervention in this area to address the needs of children who have either already lost parents to AIDS or are facing the threat of potentially losing one or both parents to AIDS.

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