

Factor Structure of a Coping Scale Across Two Samples¹

DEBRA A. MURPHY²

*Health Risk Reduction Projects
Integrated Substance Abuse Programs
Department of Psychiatry
University of California, Los Angeles*

MARY JANE ROTHERAM-BORUS

*Center for Community Health
Department of Psychiatry
University of California, Los Angeles*

WILLIAM D. MARELICH

*Health Risk Reduction Projects
Department of Psychiatry and Department of Sociology
University of California, Los Angeles*

Exploratory factor analysis (EFA) and confirmatory factor analysis (CFA) were used to assess the structure of a coping with illness scale. Two HIV-positive samples from different geographical areas were used to verify the underlying factor structure: a sample of 320 young adults (M age = 20.9 years; 72% males) and a second sample of 273 older adults (M = 38.1 years; 81% females). Exploratory results with the young adult sample assuming correlated factors showed 7 reliable factors; CFA results supported these findings in that sample. Confirmation of the 7 derived subscales using the adult sample was found using CFA, although 2 subscale reliabilities were just below .50. Correlations between the 7 subscales and other scales used for construct validation were generally as predicted. Coping similarities and differences between HIV-infected young adult and adult populations are discussed.

Coping refers to cognitive and behavioral attempts to manage external or internal demands that are perceived as harmful—that is, to overcome, tolerate, or decrease these demands (Folkman & Lazarus, 1980; Folkman, Lazarus, Dunkel-Schetter, DeLongis, & Gruen, 1986), whether or not such attempts are successful

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²Correspondence concerning this article should be addressed to Debra A. Murphy, Health Risk Reduction Projects, UCLA Research Center, 11075 Santa Monica Boulevard, Suite 200, Los Angeles, CA 90025. E-mail: dmurphy@mednet.ucla.edu

(Folkman, 1984). Coping has been proposed as a key factor in the relationship between stressful events and psychological adaptation. However, the current state of the research literature in the area of coping is complicated. There are numerous conceptual and methodological criticisms (e.g., Endler & Parker, 1990).

Theoretically, investigators have questioned whether coping is best understood as a mediating or moderating factor between stress and illness (Vingerhoets & Van Heck, 1990); whether coping is an outcome of antecedent distress more often than it serves as an antecedent to reduce anticipated, future distress (e.g., Coyne & Downey, 1991); and whether emotion-focused coping is confounded with psychopathology (e.g., Stanton, Danoff-Burg, Cameron, & Ellis, 1994). Moreover, even the most widely used scales have factor structures that have been difficult to replicate, which might indicate psychometric problems (Parker, Endler, & Bagby, 1993). One method proposed to improve appraisal of coping is to assess coping with regard to a specific context (e.g., Somerfield & Curbow, 1992; Taylor & Aspinwall, 1993). This parallels arguments that have been made by chronic illness researchers who have emphasized the need to examine coping in relation to specific illness-related stress. However, there have been few investigations examining coping strategies among chronically ill patient groups; probably coping with cancer has received the most attention (Taylor & Aspinwall, 1993).

Despite the numerous and complicated problems associated with the appraisal of coping, assessing the coping strategies of HIV-infected people is an important area of measurement in HIV research for numerous reasons. Individuals infected with HIV potentially face manifold negative life events, including ostracism from family, friends, or acquaintances; disfigurement, pain, or disability; changes in their sexual relationships; financial problems as a result of medical treatment costs; extremely complex medication regimens; and potential premature death. The response to such life events has been shown to be increased psychological distress among HIV-positive individuals (Blaney, Goodkin, Morgan, & Feaster, 1991). In turn, psychological distress levels might be related to numerous other factors, including the presence or absence of current illness symptoms and the adequacy of effective social supports (Kelly & Murphy, 1992). Therefore, notwithstanding the numerous conceptual and methodological disagreements within the research literature on coping, it is typically agreed that coping is a central issue in empirical studies of the relationship between stress and illness (e.g., Edwards & Cooper, 1988).

Few investigations have been conducted on the coping strategies utilized by persons living with HIV in terms of how these populations deal with psychological distress, physical symptomatology, societal stigma, and other HIV-related stressors. Moreover, the majority of studies that have focused on coping among HIV-infected individuals have been conducted with adult gay men. Namir, Wolcott, Fawzy, and Alumbaugh (1987) were among the first investigators to

explore the relationships between coping methods and psychological and health status of people with AIDS. They developed a coping inventory designed to assess cognitive and behavioral responses made in efforts to cope with illness. They conceptualized three categories of coping methods (active–cognitive, active–behavioral, and avoidance) and eight different coping strategies (active–positive involvement, active–expression/information seeking, active–reliance on others, cognitive–positive understanding/create meaning, cognitive–passive/ruminative, distraction, passive resignation, and avoidance–solitary/passive behaviors). The three categories of coping methods showed distinct associations with measures of psychological and health variables among men with AIDS: Active–behavioral coping was related to lower mood disturbance and better self-esteem; while avoidance was inversely related to self-esteem and positively correlated with depression. Mean scores were presented for the three coping categories, but a factor analysis of the scale was not conducted. Limitations of the study included a small sample size ($N = 50$) and the fact that the sample consisted only of males who had been diagnosed within the past 3 months, who self-selected to participate in the study. It should also be noted that while Namir et al. (1987) provided an initial list of coping with illness items, it has been argued that in studying disease-specific coping, it might be more important to obtain a list of coping strategies actually used by patients as a basis for measurement, rather than relying on standard coping instruments (Somerfield & Curbow, 1992).

The purpose and method of the current study were to: (a) investigate coping with regard to a specific context (HIV/AIDS illness) by utilizing factor analysis to determine the structure of the coping scale, and by utilizing coping items developed from previous scales as well as items obtained from HIV-positive patients; and (b) investigate whether the structure would hold across a second HIV-positive sample. The scale included items from two sources: Namir et al.'s (1987) Dealing With Illness scale; and items obtained through focus groups with HIV-infected individuals. Exploratory factor analysis (EFA) and confirmatory factor analysis (CFA) were used to investigate the structure of the scale. In addition, construct and criterion validity of the resulting subscales were evaluated through associations with other clinical and health-related measures that were available for the two samples from the assessment administered.

Method

Participants and Procedure

Sample 1: Young Adults

HIV-infected young adults ($N = 320$; 72% males; M age = 20.9 years, $SD = 2.1$, range = 13 to 24 years) were recruited through sites in four AIDS epicenters:

Los Angeles ($n = 117$), San Francisco ($n = 60$), Miami ($n = 46$), and New York ($n = 95$); 2 cases were missing an entry for site. The sample was 26% African American, 38% Hispanic/Latino, 18% Caucasian, 7% Asian, and 11% biracial and other ethnicities. Participants reported knowing their HIV status an average of 26 months (range = <1 to 153 months). Their mean T-cell count was 499.3 ($SD = 404.4$), with only 10% of the sample having an AIDS diagnosis, and 38% reporting HIV symptoms.

In Los Angeles and San Francisco, participants were recruited from community-based service centers that offer medical care. In Miami and New York, they were recruited through adolescent medicine programs. All young HIV-positives in care, age 13 to 24 years, were asked to participate in an extensive 33-session treatment program. The overall refusal rate for this study was 22%. The two most frequently given reasons for refusal were lack of interest in attending an extensive behavioral treatment program, and not wanting to tell a parent their HIV status to get permission to participate. Participants who were older than 18 years provided consent. Parental consent was obtained for participants under 18 years if a parent/guardian could be located, if parent/guardian was aware of their HIV serostatus, and if the clinician referring the participant judged it to be in the participant's best interest. Data for the current study were collected at the baseline assessment, which was administered shortly after recruitment. Young adults were paid \$25 for participation in an interview, which was a face-to-face interview conducted by multicultural, trained interview staff who entered participant responses directly into the programmed interview on a laptop computer.

Sample 2: Adults

The adult sample ($N = 273$) was composed of adult parents living with AIDS in New York City (81% females; M age = 38.1 years, $SD = 2.3$, range = 25 to 70 years, 96% of the cohort was between 30 and 50 years). The sample was 35% African American, 44% Hispanic/Latino, 11% Caucasian, 2% Asian, and 8% biracial or other ethnicities. The average length of time of knowing about their HIV status was 38.7 months (range = 2 to 166 months). Their mean T-cell count was 186.4 ($SD = 177$), with 40% having an AIDS diagnosis and the rest of the sample reporting they were HIV symptomatic.

Adults were recruited from a consecutive series of persons with advanced HIV or AIDS accepted for case management services at the New York City Division of AIDS Services for a psychosocial intervention project. Voluntary consent was obtained. The overall refusal rate for this study was 17%. As in the young adult sample, the data for this study were collected at a baseline assessment administered shortly after recruitment. Adults were paid \$20 for their participation in the interview, which was administered using the same method as with the young adult sample.

Assessment

For both samples, all measures were administered within the context of a larger baseline assessment battery. The coping scale and the measures used to validate the coping subscales are described.

Coping Scale

A 76-item scale was administered to assess coping methods. There were two sources for the items included in this scale. First, 45 items from the Namir et al. (1987) Dealing With Illness scale were included. That scale was designed to assess cognitive and behavioral responses made in efforts to cope with illness and was based on Billings and Moos' (1981) description of three methods of coping. Items selected for the scale were from Amerikan's (1985) Dealing With Illness coping instrument and the Moos, Cronkite, Billings, and Finney (1984) Health and Daily Living Form. Namir et al. further divided the three coping methods conceptually into eight specific coping strategies: active-positive involvement, active-expressive/information seeking, active-reliance on others, cognitive-positive understanding/create meaning, cognitive-passive/ruminative, distraction, passive resignation, and avoidance-solitary/passive behaviors. These eight coping strategies had good internal consistency (Cronbach's α ranged from .63 to .90; $N = 50$ gay males recently diagnosed with AIDS; Namir et al., 1987). The Namir et al. items were modified when a single item included multiple coping methods. For example, an item that included going to a friend or a professional for advice on how to change things in a situation was subdivided into more than one item to separate going to friends or going to professionals.

The second set of items for inclusion in the coping scale were collected through a set of focus groups conducted with HIV-positive young adults and separate focus groups with HIV-positive adults. These participants were recruited from the main study recruitment sites in advance of the main study initiation. At each recruitment site for young adults in each of the four cities, focus groups of 5 to 8 participants were conducted to review items from the coping measure for applicability and to elicit additional strategies used by young adults to cope with their illness. After each focus group, items that were elicited were presented to young adults in the next focus group. Concurrently, focus groups of adults were conducted with adults living with AIDS, using similar strategies by the same group leaders. No person who participated in a focus group was included in the main study.

Validation Measures

The next set of measures was used to test the convergent validity of the resulting subscales from EFA and CFA across the two samples. The measures were chosen based on their perceived association with illness and coping in applied and experimental social behavioral health research.

Depression and anxiety. The Brief Symptom Inventory (BSI; Derogatis, 1993) was used to assess depression and anxiety, which represent two of the nine primary symptom domains of the BSI. Participants were asked to report on the degree of distress for each symptom during the previous week on a 5-point scale ranging from 0 (*not at all*) to 4 (*extreme*). Internal consistency reliability for these scales was good for both the young adult and the adult samples ($\alpha = .84$ and $.87$ for depression, respectively; $\alpha = .86$ and $.87$ for anxiety, respectively).

Positive lifestyle changes. A 16-item lifestyle change scale was used to assess positive lifestyle changes (e.g., increase exercise, quit smoking). The number of positive changes made were summed and used in subsequent analyses. In addition, several other positive and negative health behaviors were assessed. Positive health behaviors included T-cell checks with their physician and the number of times they attempted to voluntarily go through a detoxification program; while negative health behaviors included medical appointments missed (i.e., number of appointments attended divided by the number scheduled) and suicide attempts. Finally, the number of physical symptoms experienced within the past 3 months was obtained from a 23-item HIV symptom checklist (Hein, Dell, Futterman, Rotheram-Borus, & Shaffer, 1995), which covers four symptom clusters (pain symptoms, $\alpha = .86$; respiratory symptoms, $\alpha = .75$; minor or self-limiting symptoms, $\alpha = .70$; and somatic loss, $\alpha = .56$).

Results

Exploratory Principal Components Analysis

A two-stage approach was taken for condensing the initial 76 coping scale items using the HIV-positive young adult sample. The first stage used exploratory principal components analysis with oblique rotation (chosen because of an expected overlap in derived components; Gorsuch, 1983). Data met the assumptions of principal components analysis (e.g., sampling adequacy, absence of singularity and extreme multicollinearity, factorability of R ; Tabachnick & Fidell, 1996). Initial inspection of a scree plot indicated that seven factors (all with eigenvalues greater than 1) would be optimal and a parallel analysis (Horn, 1965; Reise, Waller, & Comrey, 2000; Thompson & Daniel, 1996) using tables noted in Lautenschlager (1989) suggested an eight-factor solution, although our eigenvalue spread just barely missed a seven-factor cutoff, and such "close calls" with this technique might lead to arbitrary factors being retained (Fabrigar, Wegener, MacCallum, & Strahan, 1999). Comparisons between the seven- and eight-factor solutions using residual correlation matrices and interpretability of the rotated factor solutions (Fabrigar et al., 1999; Tabachnick & Fidell, 1996) showed that the seven-factor solution yielded comparable residuals to the eight-factor model and more interpretable (i.e., meaningful) rotated factors from the resulting pattern matrices. Therefore, the seven-factor solution was adopted.

Item-factor relationships were next evaluated for the seven-factor solution, with 37 of the 76 original items dropped because of low pattern coefficients (under .40). To insure that the retained items did not disproportionately exclude items from either the Namir et al. (1987) scale or focus groups, a 2×2 chi-square test was performed testing the association between item origination and whether the item was retained or excluded. No significant association at the .05 level was noted, $\chi^2(1, N = 76) = 0.18, ns$, suggesting no item-selection bias. In addition, the 37 excluded items were assessed as to their association with the validation measures to see if they exhibited correlations comparable to the retained items. Results show that the excluded items generally had lower correlations with the validation measures, further confirming their exclusion.

The second stage repeated the principal components analysis with oblique rotation, this time requesting a seven-factor solution for the reduced set of 39 items. This approach created seven subscales using the 39 retained items, with each item in a subscale given a unit weight (in the first stage analysis, the 7 derived factors were based on all 76 items; hence, the 39 items had less influence). Table 1 contains the communalities of the 39 items and pattern matrix loadings after rotation for each subscale. Overall, 53.2% of the variance was accounted for by the seven subscales (variance estimates for each rotated component are not provided since rotated solutions yield overlapping components and thus cannot be simply summed; Tabachnick & Fidell, 1996). The resulting subscales were labeled as follows: positive action, passive problem solving, self-destructive escape, social support, spiritual hope, depression/withdrawal, and nondisclosure/problem avoidance.

The results indicate that all items were associated with one of the seven subscales, and all item communalities exceeded .35. Table 2 contains the subscale correlations from the principal components analysis and internal consistency reliabilities. Overall, 6 of the 21 subscale correlations were greater than .20. The highest correlation was noted between positive action and social support ($r = .28$), indicating that individuals who are taking constructive steps in changing their behavior are more likely to be seeking social support. Passive problem solving and spiritual hope were also associated with positive action ($r = .23$ and $.21$, respectively). Those who ruminate about their situation were more likely to take positive action in changing their behavior, and those who adopted a more spiritual outlook for their situation were more likely to take positive action. Self-destructive escape was correlated with depression/withdrawal ($r = .24$), indicating that those who were more depressed and withdrawn from their surrounding environment were more likely to participate in self-destructive behaviors, such as increased drug use. Internal consistency reliabilities for the seven subscales were adequate to good, with the highest reliability noted for positive action ($\alpha = .87$) and the lowest noted for passive problem solving ($\alpha = .65$; Table 2).

Table 1

Pattern Coefficients and Communalities for Exploratory Principal Components Analysis and Standardized Parameter Estimates for Confirmatory Factor Analysis for Young Adult (YA) and Adult (A) Samples

Item	Exploratory (young adults only)							Confirmatory		
	1	2	3	4	5	6	7	h^{2a}	YA	A
1. Positive action										
Tried to figure out how to make your mark in the world	.75	-.15				.35	-.10	.60	.52	.53
Decided to make your mark on the world	.73	-.12				.24		.57	.57	.58
Formed a plan of action in your mind	.66					-.11		.50	.61	.60
Decided to get your life more together than it was in the past	.65	.15			.12			.55	.69	.69
Thought a lot more about what is really important in your life	.63	.10	-.11	.16	.11		.12	.61	.77	.67
Began solving problems you had avoided before	.61			.14				.49	.65	.65
Thought about the positive changes you have made since the illness	.61	-.12	.19			-.14		.54	.68	.72
Cared more about each day	.60	-.11	.10	.20	.20	-.17		.59	.75	.75
Cared more about yourself as a person	.52	-.14	.13	.30	.30	-.12		.55	.72	.76
Changed your eating habits	.41	.23	.12	-.11				.26	.37	.49

2. Passive problem solving									
Went over the situation again and again in your mind	.70	.13	.15	.62	.77	.71			
Daydreamed about better times in the past	.14	.11	-.13	.57	.66	.63			
Thought about how you could have done things differently	.16	.63	.21	.55	.65	.76			
Tried to understand what brought on your illness	.60	-.10	.15	.46	.53	.50			
Depended on others to cheer you up and make you feel better	-.15	.58	.22	.37	.49	.45			
Felt afraid of the pain you might face	.50	.24	-.11	.43	.49	.61			
3. Self-destructive escape									
Tried to reduce tension by taking more drugs than usual ^b	.89	.80	.91	.73					
Used drugs more to forget	.88	.78	.89	.85					
Traded sex for drugs or money ^b	.71	.50	.61	.09					
Tried to reduce tension by drinking more than usual	.13	.64	.11	.45	.56	.26			
Tried to reduce tension by smoking more than usual	.11	.64	-.11	.46	.51	.28			
4. Social support									
Went to a support group	-.11	.82	.63	.63	.59				
Went to a friend or professional to help you feel better	.14	.70	-.13	.56	.63	.66			
Talked with others who are HIV+	.13	.69	-.23	.63	.73	.61			
Went to a therapist our counselor or social worker		.65	.46	.46	.55	.58			
Tried to understand how other HIV+ people were thinking and feeling	.35	.57	.60	.70	.54				

(table continues)

Table 1 (Continued)

Item	Exploratory (young adults only)							Confirmatory		
	1	2	3	4	5	6	7	f^2 ^a	YA	A
5. Spiritual hope										
Trusted your belief in God					.80	-.20		.68	.70	.67
Started going to your place of worship (i.e., church, synagogue, mosque, etc.) more often		-.12			.72	.13		.54	.59	.49
Worked on reaching a bargain or compromise with some higher being (i.e., God) to change things					.70	.16		.56	.62	.53
Prayed for a good ending to the situation		.17	.11		.66			.55	.67	.70
6. Depression/withdrawal										
Felt depressed and didn't want to move	-.10				.14	.72		.59	.73	.78
Began to have irregular sleep patterns	.16				-.12	.66	-.12	.49	.44	.42
Hated the world		.17		-.17		.56	.10	.45	.62	.60
Deliberately got mad and yelled at people about little things to blow off steam		.18			.11	.54		.43	.56	.67
Planned ways to kill yourself ^b			.18			.48	.17	.38	.52	.30
7. Nondisclosure/problem avoidance										
Tried to keep others from knowing how you were feeling						.13	.73	.60	.67	.60
Figured out ways to hide your serostatus from others	-.12	.11				.69	.53	.61	.48	.48
Tried to keep it from bothering or upsetting you	.25					.66	.47	.47	.33	.33
Refused to think about it						.54	.36	.51	.35	.35

Note. Loadings under .10 have been left blank for ease of interpretation. Young adult, $N = 320$; Adult, $N = 273$.

^a f^2 = Extracted communality. ^bIndices that loadings across samples were different at the .01 or better level of significance.

Table 2

Exploratory Factor Correlations and Internal Consistency Reliabilities (Young Adults)

Factor	1	2	3	4	5	6	7
1. Positive action	—						
2. Passive problem solving	.23	—					
3. Self-destructive escape	-.01	.12	—				
4. Social support	.28	.18	-.06	—			
5. Spiritual hope	.21	.22	-.06	.16	—		
6. Depression/withdrawal	-.09	.16	.24	-.02	.02	—	
7. Nondisclosure/problem avoidance	-.05	.22	.15	-.07	.13	.17	—
Cronbach's α (unstandardized)	.87	.65	.80	.78	.73	.69	.77

Note. $N = 320$.

Confirmation of Exploratory Results

CFA using a maximum likelihood solution was run to verify the exploratory factor structure on the young adult sample (Gerbing & Hamilton, 1996). Conducting CFA on the exploratory analysis sample provides a direct evaluation of the factor structure, where “one goes directly to the desired solution, and rotations are not required” (Nunnally, 1978, p. 389). In particular, CFA on the exploratory analysis sample allows for confirmation of the factor loadings by directly assigning items with subscales, with nonsignificant loadings set to 0 (Gorsuch, 1983). The EQS program (Bentler, 1995) was utilized assuming correlated subscales (similar to oblique rotation), and covariance matrices were used for analyses (Cudeck, 1989).

Model fit was evaluated using multiple fit indexes, including chi-square/degrees of freedom ratio, comparative fit index (CFI), standardized root mean squared residual (SRMR), and root mean squared error of approximation (RMSEA). Lower chi-square/degrees of freedom ratios (e.g., 2:1) are indicative of better model fit (Ullman, 1996). CFI ranges in value from 0 to 1, with values below .90 suggestive that the model might be improved (Bentler & Bonett, 1980). SRMR values close to .08 or smaller indicate good model fit (Hu & Bentler, 1998); while RMSEA values less than .05 indicate good fit, .05 to .08 indicate fair fit, and values above .10 indicate poor fit (Browne & Cudeck, 1993).

Factor variances were set at 1.0, and associated measurement error indexes were provided starting values of .5. Starting values for estimation of factor loadings were set at $\pm .5$, based on loadings from the exploratory analysis. All subscales were allowed to covary and provided starting values of .5.

Table 3

Factor Correlations From Maximum Likelihood Solution Confirmatory Factor Analysis

Factor	1	2	3	4	5	6	7
Young adults							
1. Positive action	—						
2. Passive problem solving	.37**	—					
3. Self-destructive escape	-.13*	.15*	—				
4. Social support	.58**	.36**	-.06	—			
5. Spiritual hope	.47**	.41**	.03	.28**	—		
6. Depression/withdrawal	-.14*	.45**	.35**	-.04	.14	—	
7. Nondisclosure/problem avoidance	-.07	.48**	.31**	-.12	.22**	.49**	—
Adults							
1. Positive action	—						
2. Passive problem solving	.51**	—					
3. Self-destructive escape	-.04	.18*	—				
4. Social support	.61**	.50**	.17*	—			
5. Spiritual hope	.74**	.62**	-.11	.44**	—		
6. Depression/withdrawal	.10	.68**	.34**	.23**	.21**	—	
7. Nondisclosure/problem avoidance	.18*	.50**	.18*	.05	.48**	.51**	—
Cronbach's α (unstandardized)	.88	.77	.49	.73	.69	.68	.48

Note. Young adults, $N = 320$; adults, $N = 273$.

* $p < .05$. ** $p < .01$.

Findings for the young adult sample indicate that the proposed factor model fit the data fairly well. The chi-square/degrees of freedom ratio was 1.92, $\chi^2(681, N = 320) = 1,304.82$. The CFI was .85, suggesting adequate fit, although some improvement to the factor model could be made. SRMR was .07 (good fit), and RMSEA was .05, with a 90% confidence interval (CI) of .049 to .058 (good to fair fit). Together, these indices suggest good to fair fit of the factor model to the data. Standardized item parameter estimates are presented in Table 1 under the heading YA (young adult) in the Confirmatory column; subscale correlations are presented in Table 3. All items had a positive, significant association at the .05 or better level with their assigned subscales.

CFA With Adult Sample and Two-Group Analyses

A second CFA was conducted using the adult sample to assess the validity of the scale structure obtained with the young adult sample (Jöreskog & Sörbom, 1989). In addition, a number of two-group CFAs were conducted, first comparing the subscale parameter estimates, followed by a comparison of subscale correlations across the young adult and adult samples (Bentler, 1995). As with the previous CFA for young adults, the CFA for the adult sample utilized the EQS program with a covariance matrix and allowed subscales to correlate. The same analysis procedures from the young adult CFA were used, including the same start values.

CFA for the adult sample yielded a chi-square/degrees of freedom ratio of 1.95, $\chi^2(681, N = 273) = 1,326.80$, CFI was .80, suggesting the model might be improved. However, SRMR was .08 and RMSEA was .06, with a 90% CI of .054 to .064 (in the fair-fit range). With the exception of the CFI, the chi-square/degrees of freedom ratio, SRMR, and RMSEA suggest a fair model fit. The standardized item coefficients are presented in Table 1. The subscale correlations are presented in Table 3, as are the internal consistency reliabilities for the adult sample.

All items had a positive, significant association at the .05 or better level with their assigned subscales except for the "Traded sex for drugs or money" item associated with self-destructive escape ($z = 1.34$). Overall, this subscale tended to have somewhat lower item parameter estimates than did the other six subscales. Internal consistency reliabilities (α) for the adult sample were low for the subscales nondisclosure/problem avoidance ($\alpha = .48$) and self-destructive escape ($\alpha = .49$; Table 3).

A series of two-group CFAs was conducted next to provide an omnibus test of the equality of the subscale parameter estimates across both samples, followed by a test of equality of the subscale correlations if the parameter estimates were deemed equivalent (Bentler, 1995; Byrne, 1994). Assuming correlated subscales, parameter estimates were constrained across the two samples. The resulting model yielded a chi-square/degrees of freedom ratio of 2.00, $\chi^2(1401, N = 593) = 2,806.01$, with a CFI of .81 (other indexes are not available for the two-group evaluations). A subsequent two-group model with no constrained parameters yielded a chi-square/degrees of freedom ratio of 1.93, $\chi^2(1362, N = 593) = 2,631.62$ with a CFI of .83. Since the two models are nested, a chi-square difference can be obtained between the two models to evaluate whether one model is significantly superior (Loehlin, 1998). The resulting chi-square difference was 174.39 ($df = 39, N = 593, p < .001$), suggesting that equality of the parameter estimates is not tenable. Given this finding, a formal test of equality of the subscale correlations is not needed since it is unlikely that the correlations will be the same if the parameter estimates are unequal (Bentler, 1995).

Beyond the omnibus test of the subscale parameters, equalities of the individual parameter estimates across both samples were also tested using chi square with 1 degree of freedom, which assesses whether the difference between the

Table 4
Zero-Order Pearson Correlations Between Measures/Behavioral Measures and Coping Scale Factors

Measures/behavioral measures	n	Factor						
		Positive action	Nondis-closure/problem solving	Self-destructive escape	Social support	Spiritual hope	Depression/withdrawal	Passive problem solving
Depression								
Young adults	316	.02	.20***	.26**	-.01	.02	.60***	.38***
Adults	273	-.14*	.26***	.24**	.03	-.01	.49***	.30***
Anxiety								
Young adults	316	.05	.17**	.27***	.08	.00	.55***	.31***
Adults	273	.02	.24***	.22***	.10	.06	.44***	.30***
Positive changes								
Young adults	319	.33***	-.26***	-.13*	.38***	.11*	-.13**	.03
Adults	273	-.01	-.08	-.34***	-.02	.06	-.03	-.06

Number of suicide attempts										
Young adults	320	-.02	.02	.31***	-.02	-.08	.30***	.03		
Adults	273	.07	.12	.11	.07	.02	.17**	.15*		
Number of medical appointments missed										
Young adults	317	-.08	.06	.06	-.09	.01	.05	-.02		
Adults	273	.11	.19**	.26**	.05	.09	.28***	.22***		
Times in detoxification										
Young adults	315	.05	-.08	.11	.07	-.07	.06	-.08		
Adults	269	.07	-.03	.14*	.15*	-.01	.05	.13*		
How often find out T-cell count										
Young adults	318	.16**	-.11*	-.14*	.20***	.10	-.04	.10		
Adults	270	.25***	.02	.10	.28***	.18	.13*	.18**		

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

parameter estimates is significantly different from 0 (Bentler, 1995). For self-destructive escape, two items did not have equal loadings across the two samples at the .01 significance level: "Traded sex for money or drugs," $\chi^2(1, N = 593) = 41.28, p < .01$; and "Tried to reduce tension by taking more drugs than usual," $\chi^2(1, N = 593) = 22.38, p < .01$, with smaller parameter estimates noted for the adult sample. Depression/withdrawal had one item with unequal parameter estimates at the .01 level: "Planned ways to kill yourself," $\chi^2(1, N = 593) = 13.61, p < .01$, with the smaller estimate again noted for the adult sample. Effect sizes for these differences (converted to r ; Rosenthal, 1991) ranged from .15 to .26, suggesting at least small effects (an r value of .10 indicates a small effect, .30 indicates a medium effect, and .50 indicates a large effect; Cohen, 1992).

Construct and Criterion Validity

The coping subscales may be validated through their associations with other clinical and health-related measures (cf. Schutt, 1996). These include frequency of T-cell checks, level of depression and anxiety, number of times in detoxification, number of suicide attempts, proportion of missed medical appointments, and positive lifestyle changes. Subscales that represent positive affect and coping (e.g., positive action, social support, spiritual hope) should be associated with lower levels of depression and anxiety, fewer suicide attempts, fewer missed medical appointments, and more positive lifestyle changes. Subscales that represent passive or negative affect and coping (nondisclosure/problem avoidance, self-destructive escape, depression/withdrawal, and passive problem solving) should be associated with fewer T-cell checks, higher levels of depression and anxiety, increased numbers of missed medical appointments, increased number of suicide attempts, and fewer positive lifestyle changes. Table 4 contains the correlations.

Results indicate that the subscales of nondisclosure/problem solving, self-destructive escape, depression/withdrawal, and passive problem solving were all positively correlated with depression (effect sizes ranged from .20 to .60; represented by r in Table 4) and with anxiety (effect sizes = .17 to .55) for both samples at the .01 or better significance level (see Table 4 for all correlations and associated analysis sample sizes). This indicates that individuals who were more likely to use these strategies exhibited higher levels of depression and anxiety with small to large effects. For adults, the number of missed medical appointments was positively associated at the .01 or better level with negative coping strategies such as self-destructive escape, depression/withdrawal, and passive problem solving (effect sizes = .19 to .28). This suggests that adults who were more likely to use these strategies tended to have missed more appointments. Times in detoxification had little association with the subscales for the young adult sample, but showed positive associations with self-destructive escape, social support, and passive problem solving in adults (significant at the .05 level).

However, effect sizes for these associations were small (ranging from .13 to .15). Number of suicide attempts was positively associated at the .001 significance level with the self-destructive escape subscale in the young adult sample (with medium effects at about .30; more suicide attempts for those using this strategy) and positively associated at the .01 or better significance level with depression/withdrawal in both samples (effect size = .17).

Negative affect was not associated with positive coping strategies (i.e., positive action, social support, and spiritual hope). The positive action subscale was positively associated at the .01 or better significance level with efforts to obtain T-cell count information for both samples (effect sizes = .16 to .25). The young adult sample also showed greater positive lifestyle changes associated with positive coping strategies (i.e., positive action, social support, and spiritual hope, with effect sizes of .33, .38, and .11, respectively). In other words, young adults who used these strategies showed more positive lifestyle changes.

Discussion

In this study, we investigated coping with regard to a specific context (HIV/AIDS illness) by utilizing factor analysis to determine the structure of a coping scale and investigated whether the factor structure would hold across a second HIV-positive sample. This study addresses three primary criticisms in the research literature on the assessment of coping by replicating the factor structure in more than one sample (Parker et al., 1993); utilizing investigator-developed coping items, as well as items obtained from patients as a basis for measurement (Somerfield & Curbow, 1992); and assessing coping within a specific context—that of HIV (e.g., Taylor & Aspinwall, 1993). In addition, some validation of the factor subscales was conducted.

The factor model had acceptable model fit for both the young adult and the adult samples. All items were significantly associated with their assigned subscales for the young adult sample. With few exceptions, this was also true for the adult sample. Select items were also noted to have statistically different loadings across samples. Why these few items did not load comparatively across the samples might be because of developmental and population-based differences. For self-destructive escape, two items did not have equal loadings across the two samples, “Traded sex for drugs or money” and “Tried to reduce tension by taking more drugs than usual,” with lower loadings for adults. The difference between the samples on loadings of the item “Traded sex for drugs or money” is not surprising. The young adult sample included gay and bisexual young adults who live on the streets and barter sex as a means of support, whereas the adult sample was primarily older females living with their children (for adults, $M = 1.08$, $SD = 0.50$; for young adults, $M = 1.25$, $SD = 0.81$). Hence, for adults, this item would play a less important role as a form of self-destructive behavior. The depression/

withdrawal subscale had one item with unequal loadings, "Planned ways to kill yourself," with adults having a much lower loading for this item. Across samples, the mean value for adults was also lower compared to young adults (adults, $M = 1.12$, $SD = 0.52$; young adults, $M = 1.21$, $SD = 0.71$). This is consistent with general population studies of suicidal ideation and attempts, which is higher among young adults than older adults (Centers for Disease Control and Prevention, 1998; Safer, 1997), again suggesting that this item would play a less important role as a form of depression-withdrawal behavior for adults. In addition, adults' responsibilities for their children might be likely to inhibit the adults from contemplating suicide. Examining survival patterns among parents with AIDS, the number of children a parent has is linked to survival (Lee & Rotheram-Borus, 1998): the more children, the longer the survival since AIDS diagnosis.

The subscales identified were validated through their associations with other clinical and health-related measures. The subscales labeled nondisclosure/problem solving, self-destructive escape, depression/withdrawal, and passive problem solving—all of which could be described as passive or maladaptive coping—positively correlated with depression and anxiety for both samples. In addition, for the adult sample, the number of medical appointments missed was strongly associated with these coping strategies. This was not found in the young adult sample; the young adults had fewer medical appointments because they were less ill. Among the young adult sample, the number of suicide attempts was strongly associated with the self-destructive escape factor. It was associated with depression/withdrawal in both samples. Thus, there were correlations between self-destructive coping skills and maladaptive behaviors.

Conversely, subscales that could be labeled as adaptive coping methods (i.e., positive action, social support, spiritual hope) were correlated with positive outcomes for young adults and older adults. The positive action and social support subscales were strongly associated with knowledge seeking, as defined by efforts to obtain T-cell count information for both samples. In addition, the young adult sample showed greater positive lifestyle changes associated with all of these adaptive coping strategies.

This study also supports, to some extent, Namir et al.'s (1987) face-valid categorization of items. For example, of the eight coping strategies postulated by Namir et al., two seem to be very similar to subscales found in this study. Namir et al.'s active reliance on others seems to parallel the social support subscale found in the present study. Their avoidance strategy seems to parallel the nondisclosure/problem avoidance subscale. In addition, there appears to be some overlap between other strategies categorized by Namir et al. and subscales found here. Namir et al. proposed two positive-action strategies: cognitive-positive and active-positive. In the current study, these seem to be subsumed under one subscale, that of positive action. Namir et al. also proposed two strategies related to passivity: cognitive-passive/ruminative and passive/resignation. In this factor

analysis, there is one subscale related to passivity: passive problem solving. This factor analysis also has served to clarify the concepts represented by item groupings. For example, the factor analysis resulted in a spiritual hope subscale, with every item that loads highly on the subscale having to do with spiritual hope and not the more general concept of trying to create meaning in one's life. The self-destructive escape subscale items are all maladaptive self-harmful behaviors. Finally, this factor analysis of the coping items that made up Namir et al.'s eight strategies resulted in a shorter scale of seven subscales, with items dropped that did not load highly on any subscale.

This investigation attempted to determine if a coping scale developed and modified from Namir et al.'s (1987) Dealing With Illness scale and including items generated by the target assessment population could be replicated across HIV-positive samples and could be validated. Given the limitations of this study, the seven coping subscales that were identified and tested in the current study appear to have good psychometric properties.

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