

## **The Structure of Coping in AIDS Caregivers: A Factor Analytically Derived Measure<sup>1</sup>**

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We report on the development of a new coping inventory. Findings demonstrate factorial invariance for 3 factors across 3 groups of caregivers. From a 19-item summative inventory, we derived a 3-factor model including direct problem management, positive outlook, and reality-based coping. The model, inclusive of 9 items, appears to have consistent factor structure across groups. Results offer evidence that the 3-factor structure is robust and may be generalized across other groups of caregivers. The model provides an acceptable fit with coping concepts of direct problem management, cognitive, and perceptual management of meaning. Findings suggest that caregivers are similar in these 3 dimensions of coping; that domain-specific caregiving experiences are responsible for selection of coping efforts comprising these coping dimensions.

Over the last 20 years, the study of the stress process has progressed from examining the direct impact of life-event stressors on well-being to attending to factors that attenuate (buffer) or accelerate the harmful effects of stress. Coping has been central to this inquiry, as it focuses on a person's adaptive capacity to manage stress and thus reduce its ill effects. The concept of coping is wide reaching and has been difficult to capture theoretically. Moreover, current studies of coping often fall short of explaining its role in accounting for substantial outcome variance in the stress process.

In our study of 642 AIDS caregivers, we developed a new coping inventory for AIDS caregivers based on the conceptualization of coping elaborated by Pearlin (1989, 1991, 1994; Pearlin, Aneshensel, & LeBlanc, 1997; Pearlin, Aneshensel, Mullan, & Whitlach, 1995; Pearlin, Mullan, Aneshensel, Wardlaw, & Harrington, 1994; Pearlin, Mullan, Semple, & Skaff, 1990). We focus on the factor structure of our instrument and factorial invariance across three different groups of AIDS caregivers: partners, family members, and friends.

<sup>1</sup>This research was supported by a NIMH-funded study entitled "Stress and Coping Among AIDS Caregivers" (1R01 MH 44600; Leonard Pearlin, P.I.), and by a University of California University-Wide AIDS Research Programs funded study entitled "Family Caregivers for Persons with AIDS" (2-784349-20529; Leonard Pearlin, P.I.).

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## Theoretical and Measurement Considerations: Issues and Problems

The rise in interest in coping theory has generated new measurement demands. Over the past 20 years, the proliferation of research on coping has yielded several new self-report coping measures. Investigators of the stress process have long sought a finite set of strategies to define the panoply of coping efforts that people use in their attempts to negotiate stress. Most coping instruments are designed to capture a wide range of coping responses, to be mutually exclusive and collectively exhaustive of coping options (Carver & Scheir, 1994; Lazarus, 1993; Moos, Cronkite, Billings, & Finney, 1986). Most attend to certain conscious cognitions and behaviors that are performed in response to the appraisal of stressful situations.

Other coping instruments assess general coping styles or dimensions, and reactions and responses to various health conditions (for reviews see Cohen, 1987; Endler & Parker, 1990; Oakland & Ostell, 1996). Such deductive taxonomies are appealing by virtue of their simplicity and their logic. Instruments designed on these taxonomies have been tested on a variety of populations by assessing self-report responses to various conditions evoking stress (Aspinwall & Taylor, 1992; Billings & Moos, 1981, 1984; Carver et al., 1993; Fleishman & Fogel, 1994; Folkman, Chesney, Pollack, & Coates, 1993; Folkman, Dunkel-Schetter, Delongis, & Gruen, 1986; Folkman & Lazarus, 1988; Holahan & Moos, 1987; Katz & Campbell, 1994; Miller, 1987; Moos & Billings, 1982; Parkes, 1986; Parle & McGuire, 1995; Peterson, Folkman, & Bakeman, 1996; Rohde, Lewinsohn, Tilson, & Seeley, 1990; Stanton & Snider, 1993; Stone & Neal, 1984). Further, they have typically achieved a desirable level of generality with categories sufficiently broad enough to describe coping across a variety of individuals and stressful situations (Amirkhan, 1990; Beckman & Adams, 1984; Cohen, 1987). Yet it may be that such lack of attention to domain-specific stress scenarios undergirds the confusing and undesirable outcomes evident in coping research.

Some promising instruments have been published recently; still, many commonly used measures are methodologically limited in significant ways. For example, many indexes yield low to moderate reliability (internal consistency; Billings & Moos, 1984), while others fail to report internal consistency at all (McCrae & Costa, 1986). Many use subscales that have not been empirically validated within or across groups or for particular stressful conditions; rather, they have been created simply on the basis of face validity (Parker & Endler, 1992).

Because of this inattention to empirical verification, high intercorrelations have been noted among subscales that attempt to measure incongruous coping strategies (Endler & Parker, 1990; Folkman & Lazarus, 1980; Morris & Engle, 1981; Sidle, Moos, Adams, & Cady, 1969; Stone & Neal, 1984). For example,

in one of the most commonly employed instruments, the Ways of Coping Checklist (Lazarus & Folkman, 1984), items designed to tap problem-focused coping are correlated with those items that tap emotion-focused coping (Aldwin & Revenson, 1987; Oakland & Ostell, 1996). Other indexes have been constructed only with male or female subjects when important gender differences are consistently reported in the literature. In sum, most scales lack construct validity. These outcomes suggest that strategies actually used in coping do not correspond with those conceptually distinct categories delineated by theoreticians. In addition, items are often added or deleted according to hypotheses under investigation, thus theory building is set back by inconsistency in measurement and lack of coherence in the research process (cf. Chataway & Berry, 1989; Felton & Revenson, 1984; Long, 1990; MacCarthy & Brown, 1989; Martin, 1990; Parkes, 1986; Revenson & Felton, 1989; Solomon, Avitzur, & Mikulincer, 1990).

Another problem is the apparent correlation of certain coping items and subscales with measures of psychiatric symptomatology, most notably depression. We see this problem as most evident in what are often termed *emotion-focused coping items*, such as "Avoided being with people in general" and "Took it out on other people when I felt angry or depressed" (Moos et al., 1986). This issue begs the question whether some coping schemas are unique conceptually, or simply manifestations of certain psychiatric symptoms, such as depression or anxiety (Carver et al., 1993). Moreover, we do not yet understand whether such findings result specifically for particular groups or under particular stressful scenarios.

Further, some coping taxonomies and their measures simply do not apply to certain stressful situations. When such items are counted as not used by respondents because they are not applicable, measurement error is increased. The literature indicates that higher proportions of nonapplicable responses are reported for coping items classified as having a problem focus than for those classified as having an emotion focus. For example, the item "Tried to get the person to change his mind" assumes the existence of a stressful situation that is interpersonally rooted (Stone, Greenberg, Kennedy-Moore, & Newman, 1991). Such measurement difficulties are compelling reasons for investigating coping responses that are domain-specific or role-specific, rather than relying on generic measures that may fail to capture the coping variability employed in substantially different stress scenarios.

Because many studies have sampled large heterogeneous populations without controlling for similarity in the stressor experienced (Vitaliano, Russo, Carr, Maiuro, & Becker 1985), their findings add little to the body of knowledge concerning how similar situations may provoke sets of coping responses. Moreover, many studies of coping yield little ecological validity for populations dealing with significant and chronic stress, as samples are drawn from restricted populations, such as undergraduate college students (Folkman & Lazarus, 1988).

Still other studies report findings from samples that are too small to provide reliable inferences regarding the factor structure of coping items (Aldwin & Revenson, 1987; McCrae, 1984). Finally, most studies lack cross-validation and do not report evidence of factorial invariance.

### The Importance of Establishing Factorial Invariance

It is important to establish that a scale has robust and generalizable factors. Robustness provides evidence that the factor structure is not sample-dependent and that the instrument measures the same constructs in different populations (e.g., males and females). Robustness can be assessed by determining if the factor structure of a scale is the same in different groups. If the factor structure holds across groups, the scale is said to demonstrate *factorial invariance* (Horn & McArdle, 1992; Meredith, 1964, 1993; Mulaik, 1972). Factorial invariance is analogous to cross-validation where groups are formed according to some characteristic (e.g., gender, age), rather than through random assignment. Factorial invariance is a matter of degree, determined by the number of constraints imposed across groups. The most lax form of invariance requires groups to have the same configuration of salient loadings in the factor pattern matrices. That is, the factor pattern matrix in each group is constrained to have the same pattern of zero and non-zero loadings, but the values of the non-zero loadings are allowed to vary across groups. This type of invariance is sometimes referred to as *configural invariance* (Horn & McArdle, 1992) because the configuration of the factor pattern matrices is the same across the groups.

A more stringent type of invariance requires the factor pattern matrices to also have identical values for all of the loadings (within-sampling error). This type of invariance is sometimes referred to as *metric invariance* (Horn & McArdle, 1992). Progressively more stringent models of invariance are produced by requiring additional constraints. For example, we might also require equal error terms across groups (i.e., elements of the diagonal error matrices are constrained to be equal). In addition, we might require equal factor intercorrelations across groups (i.e., elements of the factor correlation matrices are constrained to be equal; Jöreskog, 1979).

A number of formal methods have been suggested for evaluating the similarity of factor structures. These include indexes for comparing factor pattern matrices (Meredith, 1964) and various methods for comparing pairs of factors (Cattell, 1966; Harman, 1960; Mulaik, 1972). A modern method for comparing factor structures is to use multiple-group structure equation modeling that can be performed with a computer program such as LISREL 8 (Jöreskog & Sörbom, 1996). LISREL 8 provides a means of comparing factor structures with different levels of constraint, and provides a statistical test of the hypothesis that a particular factor structure is invariant across different populations. In

the present study, different degrees of factorial invariance were tested using LISREL 8.

### Development of a Coping Inventory

The goal of this study is to develop a coping inventory that advances our knowledge of how caregivers cope with a chronic stressor: AIDS caregiving. We want to develop a brief, summative inventory that could be administered with relative ease, given the constraints of caregiving. Further, we wish to develop an instrument that is factorially invariant across AIDS caregiver groups.

Our instrument is based on Pearlin et al.'s (Pearlin, 1989, 1991; Pearlin, Mullan, Semple, & Skaff, 1990; Pearlin, Aneshensel, & LeBlanc, 1997) stress-proliferation model that addresses aspects of coping by examining chronic strains that evolve during specific stressful encounters. These strains, developing out of the primary stress process, are referred to as *secondary stressors*. For example, extensive caregiving activity (a primary stressor) may induce job-caregiving conflict (a secondary stressor), developing out of lifestyle limitations resulting from caregiving. Situational stress scenarios may substantially differ across groups and account for different coping responses, or the degree to which coping is directly or indirectly related to outcome variability in well-being.

For example, college students enduring a relatively time-limited stressor, such as taking an exam, may cope differently than persons caring for a chronically ill family member. Chronic stress, inherent in caregiving, may induce secondary stress, such as job-caregiving conflict, financial difficulties, or relationship loss. Coping may act directly on the primary stressor or may help to reduce the proliferation of secondary stressors. Hence, coping does not have a singular or generalized role in the stress-reduction process. Rather, both coping and stress processes need to be examined relative to domain-specific stressful situations.

Importantly, coping efforts are conceived of as differing by how they function to reduce stress for an individual. These coping functions include: (a) the direct modification of circumstances giving rise to stress, or direct management of the problem; (b) the cognitive and perceptual management of the meaning of circumstances that minimize the toxicity of the stressor; and (c) the control and relief of the distressful sequelae of symptoms and emotions that are generated by the stressor (Pearlin, 1991). Certain circumstances yield different coping functions. For example, some stressors, such as those embedded in formal organizations and bureaucracies, may be beyond an individual's capacity for direct management of the problem. By contrast, stressors embedded in informal role sets may be more easily managed through direct problem-solving efforts. Where problem solving is not a realistic option, one must rely on cognitive and perceptual management of meaning, or on controlling the emotional distress produced by stressful encounters (Pearlin, 1991).

### Instrument Construction

To begin instrument construction, we conducted 25 in-depth pilot interviews with AIDS caregivers representing a variety of caregiving statuses: partners, family members, and friends. The health conditions of caregivers ranged from those who were not infected with HIV to those who had AIDS-defining symptoms. All of the interviews were conducted in San Francisco, California. From the pilot interviews, 19 items were generated and were conceptually classified according to Pearlin's (1991) paradigm (Table 1) of the total number of items, 3 dealt with direct management of the problems embedded in the role of the caregiver (see Items Q, R, and S in Table 1). Further, 13 items reflected the management of the cognitive and perceptual meaning of the stressor to the caregiver. Of these, 4 measured positive outlook (Items C, J, L, and N), 2 measured accessing social support (Items B and K), 2 measured reduction of expectations through reality-based coping (Items F and M), 3 measured cognitive distraction (Items D, E, and I), and 2 measured making positive comparisons (Items A and O). Last, 3 items reflected the management of distress—2 measured alcohol and drug use for purposes of relaxation (Items G and H), and 1 item addressed seeking the help of God (Item P).

We employed a 4-point Likert-type response continuum that elicited from caregivers the extent to which each item described ways of dealing with changes in their lives as a result of AIDS caregiving. The responses ranged from 1 (*not at all like you*) to 4 (*very much like you*). The index is summative and yields a scoring range from a minimum of 19 to a maximum of 76 points. We pilot-tested the instrument on 25 caregivers to examine whether selected items were understood and endorsed with reasonable frequency. In addition, we examined the internal consistency reliability of the index.

### Method

#### *Participants*

The data presented come from a five-wave panel survey of the stress and coping process of informal AIDS caregivers. Here, we report sample characteristics from Wave 1 data only. Approximately half of our sample was recruited from Los Angeles County, and half was recruited from the San Francisco Bay area. Data were collected from face-to-face interviews of 642 caregivers by trained interviewers using structured interview schedules. Criteria for inclusion were employed in telephone screening of potential respondents. Our inclusion criteria required, first, that care be provided in the community outside of hospitals, hospices, or other institutional settings. Second, care could not be given in conjunction with employment as a health-care worker. Third, caregiving assistance had

Table 1

*Coping Scale Based on Pearlin's (1991) Conceptualization*

- 
- A. You think about better times in the past.
  - B. You talk with people who've been through the same thing.
  - C. You look for something good in the situation.
  - D. You turn to work or other activities.
  - E. You try not to think about the future.
  - F. You accept things that you cannot do anything about.
  - G. You drink alcohol to relax.
  - H. You take drugs to relax.
  - I. You try to think about something else.
  - J. You focus on the positive things in life.
  - K. You talk to someone about how you feel.
  - L. You tell yourself that things will be better in the future.
  - M. You just face up to reality.
  - N. You try to keep a sense of humor.
  - O. You think about others who are worse off than you are.
  - P. You seek God's help.
  - Q. You get information about different services in the community.
  - R. You make arrangements for the service ( ) uses.
  - S. You check up on the services ( ) uses, keeping in touch with the people who provide them.
- 

*Note.* The Coping Scale was measured on a 4-point continuum ranging from 1 (*not at all*) to 4 (*very much like you*).

to extend beyond offering emotional support; rather, it had to include activities encompassing instrumental care, such as provision of help with activities of daily living. Fourth, the potential respondent had to be the primary caregiver of the person with AIDS.

Several methods were used to recruit respondents, including newspaper advertisements placed in a variety of newspapers and other media, flyers, provider referrals, and word of mouth. Overall, participants were recruited primarily and about nearly equally through media advertisements and AIDS service organizations. Interviews lasted approximately 90 min and were administered in a setting agreed upon by the respondent. Most of the interviews took place in the homes of the caregivers. Respondents were reimbursed \$25 for the interview.

Our sample of 642 AIDS caregivers consisted of three groups of care-givers: partners, family members, and friends. The partners group consisted of predominantly gay male partners and a minority of heterosexual married or cohabiting partners. The friends group consisted of predominantly gay male friends and acquaintances. Mothers represented approximately two thirds of the family group; while siblings, fathers, and other relatives represented about one third.

Of the total sample, 46% ( $n = 295$ ) were partners, including 235 gay male partners and 60 wives; 17% ( $n = 110$ ) were family members; and 37% ( $n = 237$ ) were friends. The majority of our sample was non-Hispanic Caucasian. Respectively, they comprised 78% ( $n = 231$ ) of the partners group, 59% ( $n = 65$ ) of the family group, and 74% ( $n = 176$ ) of the friends group. Of the total representation of African Americans, 9% ( $n = 27$ ) were partners, 24% ( $n = 26$ ) were family members, and 11% ( $n = 26$ ) were friends. Hispanics represented 8% ( $n = 23$ ) of the partners group, 11% ( $n = 12$ ) of the family group, and 8% ( $n = 19$ ) of the friends group. Small minorities of respondents were from Asian, native American, and other ethnic backgrounds. The mean age was 38.70 ( $SD = 9.33$ ) years for partners, 48.17 ( $SD = 14.1$ ) years for family members, and 38.87 ( $SD = 10.1$ ) years for friends. Educational attainments ranged from 8 to 18 years, with a mean of 14.3 years ( $SD = 2.4$ ). Incomes ranged from \$0 to \$82,500 ( $M = \$18,000$ ,  $SD = \$18,300$ ), with the distribution skewed toward the lower end. Approximately 42.7% had incomes under \$10,000; 26.4% had incomes between \$10,000 and \$19,999; 18.8% had incomes between \$20,000 and \$39,999; and 12.1% had incomes of \$40,000 or more.

### *Procedure*

We assessed factorial invariance of the coping scale in this study, across the three groups of partners, family members, and friends. Given the tentative nature of the theory underlying the coping items, exploratory factor analysis was used to assess the factor structure in each group and the similarity of the structures across groups.<sup>3</sup> Separate factor analyses were carried out on the three groups using principal axis factoring (PAF) with oblique rotation (direct oblimin). PAF was used because of its appropriateness for our type of data and goals (Cliff, 1987; Gorsuch, 1983). Oblique rotation was performed because we assumed that at least some of the factors were correlated, and oblique rotation allows for the most unconstrained models possible.

The first issue is to determine if the three groups had the same number of factors. Inspection of the scree plots and the magnitudes of the eigenvalues suggested slightly different numbers of factors for each group. Because the aim is to

<sup>3</sup>The correlation matrices for the three groups are available upon request from the authors.



determine the extent of common information across the three groups, it seemed logical to extract the same number of factors. A seven-solution model was found to produce the highest number of similar factors across the three groups, and this is the solution that will be presented.

When comparing factor structures in different groups, the factor pattern matrices should be evaluated for similarity, rather than the factor structure matrices (Meredith, 1964; Mulaik, 1972). Table 2 shows the rotated factor pattern matrices for the three groups, along with the eigenvalues and amount of variance accounted for by each factor. A cutoff of .30 was used for salient loadings because it corresponds to about 10% of the variance of a variable (Cliff, 1987). The salient loadings in Table 2 are in italicized type. The separate solutions resemble one another. Similar items load on the first four factors in all three groups.

These factor items (in their groupings) are (Q, R, S), (C, J, N), (F, M), and (E, I). We might label these factors *Direct Problem Management*, *Positive Outlook*, *Reality-Based Coping*, and *Cognitive Distraction*, respectively. As is delineated theoretically (Pearlin, 1991), two dimensions of the model are represented, the direct modification of circumstances giving rise to stress (i.e., direct problem management) and the cognitive and perceptual management of the meaning of circumstances giving rise to stress (i.e., Reality-Based Coping and Cognitive Distraction).

Table 3 shows the factor correlations for the three groups. A few general comments can be made about the correlations. There are modest positive correlations between Factor 2 (Positive Outlook) and Factor 3 (Reality-Based Coping) in all of the groups, and somewhat smaller negative correlations between Factor 2 (Positive Outlook) and Factor 4 (Cognitive Distraction). These correlations support an oblique solution. The correlations with Factor 7 can probably be dismissed, because Factor 7 does not have any common items among the three groups and appears to be a "junk" factor.

Judging from the separate analyses, four factors appear to be invariant across the three groups. Though an informal inspection of the factor structures is a good starting point, a formal test of the similarity of the factor structures across the groups provides greater rigor in assessing these structures. The four-factor model was tested for different degrees of factorial invariance using LISREL 8 with two slight modifications. First, Table 2 shows that for the second factor, Positive Outlook, Item L was salient in the friends and family groups, but not in the partner group. Item L did have a small positive loading in the partner group (.17; Item A was ignored because its negative loading was nonsensical). Substantively speaking, Item L appears to belong with the items measuring positive outlook. Therefore, Item L will be included with the Positive Outlook factor (now consisting of C, J, L, and N). Second, the same logic was used to include Item D with the Cognitive Distraction factor. Item D had a relatively small loading in the friends group, but was salient in the partners and family groups. Item D

Table 2

*Factor Pattern Matrices of Partners, Friends, and Family Groups*

Item	Factor						
	1	2	3	4	5	6	7
Partners ( $n = 295$ )							
A	.010	-.332	.024	.353	.116	.015	.154
B	.029	-.046	-.037	.065	.659	-.033	-.093
C	-.010	.688	.057	.132	-.001	-.045	.126
D	-.185	.161	.065	.305	.295	-.085	-.061
E	.052	.033	-.059	.433	-.084	.073	-.089
F	.000	.074	.541	.053	-.050	-.004	.018
G	.028	.005	.250	.098	.050	.372	-.152
H	-.058	-.001	-.091	-.008	-.021	.528	.053
I	.063	-.038	-.015	.497	-.031	.069	.370
J	.033	.694	.129	.007	.027	-.059	.109
K	.077	.047	.005	-.258	.498	.071	.094
L	-.040	.171	-.053	.019	.012	.016	.420
M	.020	.120	.464	-.173	.053	-.042	.043
N	.037	.451	.065	-.043	.049	.050	.041
O	.009	-.059	.191	-.063	-.048	-.032	.420
P	.061	.125	-.072	.045	.011	-.044	.380
Q	.793	.034	-.079	-.023	.123	.085	.041
R	.951	-.002	.039	.077	-.030	.008	-.042
S	.835	.031	.063	.050	-.015	-.185	-.028
Eigenvalue	2.786	2.380	1.646	1.480	1.302	1.115	1.110
% variance	14.7	12.5	8.7	7.8	6.9	5.9	5.8
Friends ( $n = 237$ )							
A	.060	.037	-.110	.038	-.058	.304	-.230
B	.102	-.049	.022	.051	.429	.135	-.075
C	.038	.270	.087	-.085	.237	-.150	-.273
D	-.031	-.039	-.077	.201	.247	-.018	-.345
E	.066	-.159	.057	.434	-.164	-.054	.045

*(table continues)*

Table 2 (Continued)

Item	Factor						
	1	2	3	4	5	6	7
F	-.023	.076	.587	.048	-.044	.090	.070
G	.054	.142	-.093	-.087	-.046	.433	-.160
H	-.034	-.030	.133	.020	.086	.554	.009
I	-.037	.212	-.038	.574	.060	.012	-.095
J	-.016	.495	.211	.001	.082	-.240	-.181
K	-.066	.049	-.055	-.125	.451	-.038	.110
L	.070	.609	.027	.042	-.010	.090	.047
M	.084	-.204	.372	-.170	.122	-.272	-.178
N	-.020	.241	.297	-.157	-.111	.023	-.222
O	-.008	.029	.028	.010	-.056	.090	-.509
P	.062	.179	.046	-.012	-.072	-.244	-.075
Q	.766	-.081	.024	-.010	-.012	.037	-.018
R	.904	.060	-.075	.002	-.010	-.087	.028
S	.787	.071	.007	.008	.064	.021	.083
Eigenvalue	2.633	2.125	1.878	1.413	1.278	1.106	0.976
% variance	13.9	11.2	9.9	7.4	6.7	5.8	5.1
Family ( $n = 110$ )							
A	.137	-.179	.042	.051	.064	.744	.126
B	-.082	.232	.019	.015	.559	.273	.186
C	-.068	.561	.054	.065	.144	-.121	.042
D	.039	.096	.038	.666	.100	-.107	.111
E	.085	.018	-.126	.532	.052	-.007	-.433
F	.035	.054	.680	.066	-.069	-.077	.023
G	-.115	.065	-.155	-.076	.003	.229	-.087
H	-.068	.016	.093	.168	.222	.124	-.097
I	-.036	-.032	-.015	.605	-.223	.113	.114
J	-.085	.535	.249	-.059	-.232	-.007	.139
K	-.011	.054	-.065	.133	.069	.076	.730
L	.018	.507	-.004	.142	-.167	.232	.037
M	-.020	-.004	.741	-.114	.076	.053	-.069

(table continues)

Table 2 (Continued)

Item	Factor						
	1	2	3	4	5	6	7
N	.084	.723	-.085	-.077	.071	-.109	.006
O	.086	.316	.124	.091	-.051	.052	-.124
P	-.099	.132	.066	.151	-.447	.125	-.021
Q	-.834	-.012	-.094	.114	.043	-.137	.069
R	-.941	-.111	.027	-.004	.027	-.107	-.008
S	-.824	.021	.067	-.129	-.094	.141	-.034
Eigenvalue	2.428	2.251	1.242	.9845	0.833	0.684	0.613
% Variance	12.8	11.8	6.5	5.2	4.4	3.6	3.2

*Note.* Salient loadings are italicized.

will be included with the Cognitive Distraction factor (now consisting of D, E, and I).

Model 0 is a four-factor configural model. Recall that configural invariance requires the factor pattern matrices to have the same configuration, but the non-zero loadings can vary. The factor correlations were free to vary from group to group. The results for Model 0 are shown in the first row of Table 4. The chi square is highly significant, and two of the fit indexes show values below .90 (see Jöreskog & Sörbom, 1996, for a discussion of the fit indexes), indicating a relatively poor fit for Model 0 across all three groups. Individual group chi squares (not presented) show that the fit for Model 0 was very poor in the partners group and the friends group. Although the four-factor model fit the best in the family group, this is probably because of the relatively low sample size for this group ( $n = 110$ ). The chi square is a function of sample size, and a smaller sample will always yield a better fit (Loehlin, 1992).

The poor fit across all of the groups of Model 0 appears to be a result of the Cognitive Distraction factor, with its items D, E, and I. Inspection of the parameter estimates (not presented) showed uninterpretable estimates for Items D, E, and I in the partners and the friends groups. In the partners group, the estimates for Items E and I are negative, and the correlation of the distraction variable with itself is also negative. In the friends group, Items D and E are close to zero, and Item I is very large, relative to all other estimates. Because of these results, the Cognitive Distraction factor was omitted from further analyses.

Model 1 is a three-factor configural invariance model consisting of the factors of Direct Problem Management (Items Q, R, S), Positive Outlook (Items C, J, L, N), and Reality-Based Coping (Items F, M). Factor correlations were

Table 3

*Factor Correlations for Partners, Friends, and Family Groups*

	Factor						
	1	2	3	4	5	6	7
Partners							
1	—						
2	-.007	—					
3	.048	.257	—				
4	-.039	-.099	-.065	—			
5	-.006	.172	.090	.040	—		
6	.015	-.106	.056	.100	.019	—	
7	.134	.237	.029	.026	.012	-.130	—
Friends							
1	—						
2	.095	—					
3	.040	.183	—				
4	.049	-.122	-.215	—			
5	-.047	-.071	-.066	-.110	—		
6	-.002	.003	-.189	.166	.032	—	
7	-.137	-.297	-.155	-.019	-.170	-.091	—
Family							
1	—						
2	-.068	—					
3	.105	.247	—				
4	-.059	-.232	-.112	—			
5	-.025	-.024	-.053	.007	—		
6	-.154	.092	-.034	-.160	.040	—	
7	.039	-.088	-.076	-.021	.032	.012	—

free to vary from group to group. The chi-square value for Model 1 indicates a fairly good fit ( $p = .03$ ), and some of the fit indexes are quite large (none are below .91). As the three-factor model fit the data fairly well, we wanted to examine the relative fit of more constrained three-factor models (i.e., three-factor metric models).

Table 4

*Invariance Models and Accompanying Fit Indexes*

Model	$\chi^2$	df	p value	GFI	NFI	CFI	RFI
0	238.29	144	<.001	.93	.88	.95	.83
1	95.41	72	.03	.95	.94	.99	.91
2	113.06	84	.02	.94	.98	.98	.91
3	130.16	98	.02	.93	.92	.98	.91

*Note.* GFI = generalized fit index, NFI = normed fit index, CFI = comparative fit index, RFI = relative fit index (Jöreskog & Sörbom, 1996).

Model 2 is a test of metric invariance for the three-factor model. The factor correlations were again free to vary. Recall that metric invariance requires the factor pattern matrices to have identical values for the non-zero loadings. The chi-square value for Model 2 indicates about the same degree of fit as for Model 1 ( $p = .02$ ), as do the fit indexes. Model 2 is more parsimonious (i.e., fewer free parameters) than is Model 1 and fits the data about as well. Therefore, Model 2 is preferred over Model 1.

Model 3 is more constrained than Model 2, specifying metric invariance for the three-factor model with the additional constraints that the correlation between the Positive Outlook and Reality-Based Coping factors is equal across groups, and all other factor correlations are zero. Like the two previous models, the chi-square value for Model 3 shows fairly good fit ( $p = .02$ ), and the values of the fit indexes are relatively high. Model 3 is more parsimonious than is Model 2, and its fit to the data is very close. Therefore, Model 3 is preferred over Model 2. Figure 1 shows the parameter estimates for Model 3 based on the covariances for all of the groups (Jöreskog & Sörbom, 1996). Error estimates are not labeled to signify that they vary across the three groups.

A few comments about Model 3 are in order. The correlation between the Positive Outlook and Reality-Based Coping factors is consistent with the solutions from the exploratory analyses. Item L has the lowest loading on Positive Outlook, which is also consistent with the exploratory results (see the factor pattern matrix for the partners group). The largest loadings in Model 3 appear on the Direct Problem Management factor, and the loading for Item R is especially high (.97). The two loadings on the Reality-Based Coping factor are about equal and moderately high.

A number of models (more constrained than Model 3) were tried, but none fit the data very well. Of Models 1, 2, and 3, Model 3 has the best balance of parsimony and fit to the data. That is, Model 3 has the most constraints (the most stringent invariance), but fits the data about as well as the more relaxed models.

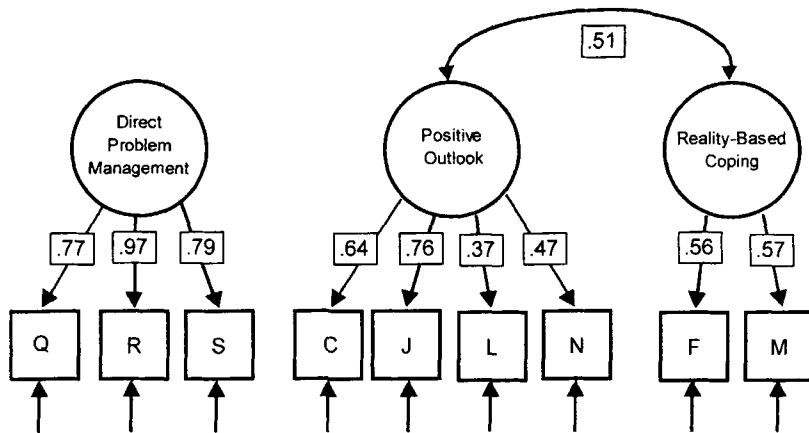


Figure 1. Final model (Model 3) with standardized parameter estimates based on all groups. Error estimates are omitted to indicate that they vary across groups.

### Discussion

The primary goal of this study was to develop a coping inventory that advances knowledge of how caregivers cope in relationship to a chronic stressor: AIDS caregiving. Our aim was to develop a brief inventory that could be administered with relative ease, given the constraints of caregiving. Further, we wished to develop an instrument that was theoretically based, that was psychometrically sound, and that established factorial invariance across AIDS caregiver groups. Those who conduct research with this population are consistently faced with diversity among caregiver groups, not only with respect to background characteristics of the caregiver and the relationship between caregivers and those receiving care, but also with respect to the range of caregiving experiences. For example, in our study, although caregivers had to be providing care for those with AIDS-defining conditions, caregiving experiences ranged from provision of instrumental help (e.g., cleaning, shopping, meal preparation, visiting doctors) and coordination of services, to performance of extensive activities of daily living, supervision of life-support systems, and coping with AIDS dementia. Such wide-ranging care needs elicit variability in caregiver coping responses. Because of this situation, it is important to have access to research instruments that are suited for use with a variety of caregivers confronting differing caregiving experiences and that are responsive to the domain-specific stressors associated with conditions of the illness.

Our findings demonstrate that factorial invariance exists for three factors of coping across three groups of AIDS caregivers, partners, family members, and

friends facing a wide range of caregiving experiences. From a 19-item inventory, based on Pearlin et al.'s (1990; Pearlin, 1989, 1991, 1994) conceptual model, we derived a three-factor model consisting of Direct Problem Management, Positive Outlook, and Reality-Based Coping (Figure 1). The three-factor model, inclusive of nine items, appears to have a consistent factor structure across the groups used in this study. The results offer evidence that the three-factor structure is relatively robust and may be generalizable across other groups of caregivers. One caveat is that the Reality-Based coping factor may be underidentified, having only two items as indicators. Hence, developing at least one new item would more adequately define the factor.

The three-factor model provides an acceptable fit with the coping concepts of direct problem management, and cognitive and perceptual management of meaning as delineated by Pearlin et al. (1990; Pearlin, 1989, 1991). Such findings suggest that AIDS caregiver groups are similar in the use of these three dimensions of coping. Our findings point to the probability that domain-specific caregiving experiences are responsible for the selection of coping efforts that comprise these coping dimensions.

Our attentions turn to those factors (and items) that were not consistent across all three groups. For example, the Cognitive Distraction factor was not factorially invariant across groups and exhibited the strongest fit for the family caregiver group. This finding may be an artifact of sample size, as the family group had half the sample size of the other groups. Such findings suggest that the good fit for the four-factor model is most probably an artifact of sample size.

In addition, it may be the case that although consistency is evident in some dimensions of coping across caregiver groups, differences in factor structure of some coping dimensions may be a result of differences in caregiver background characteristics and caregiving circumstances. Such characteristics may include the caregiver's relationship to the person being cared for, the age of the caregiver, caregiver ethnicity, the presence of ties to supportive friends or other community-based resources, or the constancy of the presence of AIDS in the lives of caregivers. For example, our sample of family members, composed largely of heterosexual respondents, was older than the partners or friends groups, and was represented by a higher percentage of ethnic minorities of color. Coping efforts may differ across these background factors. In addition, the family group may be relatively more isolated from their AIDS caregiving cohorts, from AIDS-related experiences, and from community-based services than our sample of friends or partners, as these two latter groups were composed largely of gay male respondents. Thus, coping efforts may differ across these parameters. In particular, cognitive distraction, exhibiting the strongest fit for the family caregiver group, may be a more viable coping mechanism for family members than for gay males, who may be confronted by AIDS to a greater extent in their workplaces, in their friendship systems, and in their communities.



Coping efforts may differ as a result of many of these conditions. Such circumstances may be responsible for lack of factorial invariance across structures representing efforts to control distressing emotions, or to access social support tapped through items such as, "You talk to other people who've been through the same thing." Other items not represented consistently across factor structures may vary in meaning across caregiver groups. Consequently, the use of coping efforts may vary across groups. For example, in our inventory, Item O which reads "You think about others who are worse off than you are," may hold different meanings and levels of abstraction for partners than for friends or family caregivers. Still other items require refinement in wording and are probably too broadly defined to load on a factor structure. This condition may exist for items such as Item P: "You seek God's help."

Our findings suggest that coping efforts may be quite tied to domain-specific stressors, such as those experienced in long-term caregiving. Thus, the design of coping instruments requires substantial knowledge of domain-specific stress associated with distinctive illness manifestations. As in investigations of role strain that must account for the particular role demands and consequent evolving strains, investigations of coping are probably most valid when they access greater specificity of coping efforts resulting from distinctive stress scenarios. For example, although caregiving may be an expected role for those with loved ones in their elder years, AIDS caregiving is often an unexpected or an asynchronous experience for those in their young-adult and middle years. In addition, the vicissitudes of the disease engender constant shifts in the need for provision of care. As Pearlman et al. (1997) suggest, such shifts may affect the domains of caregiving and the levels of primary and secondary stress experienced by the caregiver. Hence, coping efforts used to attenuate stress in AIDS caregiving may be tied to these various caregiving domains as well as to the background characteristics of the caregiver.

Our results support this theory. Although some dimensions of coping were invariant, others differed across caregiver groups; that is, whether the caregiver was a partner, a family member, or a friend. Such findings point to the importance of examining background factors in analyzing factor structures and strengthening the robustness of coping instruments. Measurement of a complex variable such as coping presents significant challenges. We encourage other investigators to pursue the design of improved coping instruments by establishing factorial invariance and assessing coping in domain-specific stress scenarios. Such efforts may very well enhance our understanding of the role of coping in distinctive situations and its function in attenuating the stress process.

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