

## **The Association of Coping To Physical and Psychological Health Outcomes: A Meta-Analytic Review**

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*We performed a series of meta-analyses examining the associations between coping and health-related outcomes in nonclinical adult samples. Results revealed that problem-focused coping was positively correlated with overall health outcomes, whereas confrontive coping, distancing, self-control, seeking social support, accepting responsibility, avoidance, and wishful thinking were each negatively correlated with overall health outcomes. Neither planful problem solving nor positive reappraisal was significantly associated with overall health outcomes in our analyses. However, type of health outcome (i.e., physical vs. psychological) and situational characteristics (i.e., stressor type, controllability, and duration) moderated many of the overall associations.*

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**KEY WORDS:** Ways of Coping Questionnaire; Ways of Coping Checklist; health outcomes; meta-analysis.

### **INTRODUCTION**

Coping is arguably one of the most frequently studied concepts in the behavioral sciences. Researchers have focused on multiple aspects of coping, including the nature and structure of coping processes and the physiological and psychological health implications of coping (e.g., Carver and

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Scheier, 1994; Lazarus, 1991; Lazarus and Folkman, 1984; O'Leary, 1990). The present paper used meta-analyses to examine associations between coping and health outcomes. Specifically, the analyses examined whether specific coping strategies were differentially associated with physical (e.g., disease morbidity) and psychological (e.g., depression) health outcomes in nonclinical adult populations. The analyses also examined several potential moderators of the coping-health outcome association.

## Coping

Researchers have defined coping in many ways. Some researchers have taken a *trait* approach, defining coping as habitual problem-solving thoughts and actions (e.g., Haan, 1969; Vaillant, 1977). In this approach, researchers classify individuals according to their stable coping styles, measured through clinical interviews or questionnaires (e.g., Goldstein, 1973; Menninger, 1963).

Other researchers have taken a *process* approach to coping, emphasizing that coping is a transactional phenomenon with coping efforts constantly changing to meet evolving demands of a stressful situation. For example, Lazarus and his colleagues (1991; Folkman and Lazarus, 1985; Folkman *et al.*, 1986a) defined coping as "cognitive and behavioral efforts to manage demands that are appraised as taxing or exceeding the resources of the person" (Lazarus and Folkman, 1984, p. 141). In Lazarus' definition, coping involves efforts to alter the stressful situation (i.e., problem-focused coping) as well as efforts to regulate the emotional distress associated with the situation (i.e., emotion-focused coping). Examples of problem-focused coping include seeking information, planning, and taking action. Examples of emotion-focused coping include focusing on positive aspects of the situation, mental or behavioral disengagement, and seeking emotional support from others. Although conceptually distinct, Lazarus suggests that both forms of coping can reduce psychological distress and that people use both problem-and emotion-focused coping in most stressful episodes (Folkman and Lazarus, 1980, 1985; Lazarus, 1993).

In contrast to the trait approach, researchers following a process approach to coping suggest that knowing how an individual copes with stress in general may reveal very little about how he or she will cope with a specific stressful event. Instead, the strategy or strategies that an individual uses depend both on situational (e.g., changeability, controllability) and individual factors [e.g., self-confidence, perceived resources (Holahan and Moos, 1987; Lazarus and Folkman, 1984; Pearlin and Schooler, 1978)]. For example, Folkman and Lazarus (1985) examined how coping changed across three stages of a college exam. The authors found that self-reported active coping

was greatest before the exam and lower after the exam. In contrast, participants reported using distancing (e.g., refusing to think about the exam) most during the postexam stage when nothing could be done but wait for scores. After receiving exam scores, however, participants' reported use of distancing dropped to that observed during the preparation stage.

### The Ways of Coping Questionnaire

Most researchers rely on questionnaires to assess coping. One common coping measure is the Revised Ways of Coping Questionnaire (WOC-R) (Folkman and Lazarus, 1985; Folkman *et al.*, 1986a). The original WOC questionnaire (Folkman and Lazarus, 1980) consisted of 75 specific activities used to manage stressful episodes, with participants using the yes/no response format to indicate whether or not they had used each strategy. In analyzing the questionnaire, the authors divided each item into one of two categories (i.e., problem-focused coping and emotion-focused coping).

Later, Folkman and Lazarus (1985) removed or reworded several items from the questionnaire and replaced the yes/no response format with a 4-point Likert scale ranging from 0 ("does not apply; not used") to 3 ("used a great deal"). Their factor analysis of the revised questionnaire (i.e., the WOC-R) yielded eight subscales, including one problem-focused scale, six emotion-focused scales, and one mixed coping strategy scale. The problem-focused scale was *problem-focused coping*, referring to the individual's active stress-reduction efforts, such as creating and implementing a plan. The six emotion-focused coping scales included *wishful thinking*, referring to the individual's efforts to mentally avoid the situation; *distancing*, referring to efforts to remove oneself mentally from the stressful encounter; *emphasizing the positive*, referring to the individual's efforts to focus on the situation's positive aspects; *self-blame*, referring to the individual's acknowledgment of personal responsibility for the situation; *tension reduction*, referring to the individual's efforts to alleviate tension resulting from the situation; and *self-isolation*, referring to efforts to withdraw physically or emotionally from the situation or from others. The remaining scale was *seeking social support*, referring to either problem-focused (e.g., information seeking, tangible assistance) or emotion-focused (e.g., sympathy) interactions with others.

Using a larger sample, Folkman and Lazarus performed a second factor analysis on the WOC-R (Folkman *et al.*, 1986a). Although the factor labels changed slightly, most of the factors remained conceptually similar to the earlier WOC revision. A result of the second factor analysis is that the authors divided the problem-focused coping dimension into *planful problem solving*, referring to deliberate actions or analytical efforts to alter the

situation; and *confrontive coping*, referring to hostile or aggressive efforts to alter the situation.

Vitaliano *et al.* (1985) also revised the WOC-R, labeling their scale the Ways of Coping Checklist (WCCL), with many of their (five) factors overlapping Folkman and Lazarus' results. Table I presents the subscales from the two WOC-R factor analyses (Folkman and Lazarus, 1985; Folkman *et al.*, 1986a) and from the WCCL factor analysis (Vitaliano *et al.*, 1985), as well as the percentage of overlap between conceptually similar factors. Although some researchers reword or re-factor analyze the WOC-R or WCCL to suit their specific samples better, a number of researchers use one of the three questionnaires described above, retaining the respective questionnaires' coping factors.

As Table I illustrates, there is considerable overlap between scales among the three factor analyses. Based on these overlaps, we combined conceptually similar scales in our meta-analyses. Specifically, we combined problem-focused coping with planful problem solving, detachment with distancing, the two wishful thinking scales, and focusing on the positives with positive reappraisal. We also combined the three seeking social support scales and the self-blame, accepting responsibility, and blames self-scales. Because each overlapped to a lesser extent with multiple scales, we kept Vitaliano's problem-focused coping and avoidance scales separate, as well as Folkman and co-workers' confrontive coping, self-control, and escape-avoidance scales.<sup>5</sup> Sample items from the scales used in the present meta-analyses are included in the Appendix.

It is appropriate here to discuss briefly what the WOC-R and WCCL measure. Assuming a 0–3 response scale, the questionnaires measure subjective reports of how much a person used a particular coping strategy in a specific situation. Importantly, they do not measure whether the person thought the strategy was effective or whether she skillfully implemented the strategy.

### Coping Paradigms

Researchers use the WOC-R or the WCCL in one of two general paradigms. In the *self-selected* paradigm, researchers have each participant choose his or her own stressful event (e.g., the most stressful event during the last week or month). Researchers may also have participants provide additional information about the event to prime memories for the event. For example, Folkman *et al.* (1986a) asked each participant to remember

<sup>5</sup>None of the studies included in our meta-analyses used Folkman and Lazarus' (1985) *kept to self* or *tension reduction* scales.

**Table I.** Percentage Overlap Among Conceptually Similar Factors on the Ways of Coping Questionnaire (WOC-R) and Ways of Coping Checklist (WCCL-R)

	Folkman & Lazarus (1985)	Folkman <i>et al.</i> (1986)	Vitaliano <i>et al.</i> (1985, 1987)
Folkman & Lazarus (1985): WOC-R			
Problem-focused coping (11 items)	—	Planful problem solving (83%)	Problem-focused coping (40%)
Wishful thinking (5 items)	—	—	Wishful thinking (75%)
Detachment (6 items)	—	Distancing (50%)	—
Seeking social support (7 items)	—	Seeking social support (83%)	Seeks social support (83%)
Focusing on the positive (4 items)	—	Positive reappraisal (43%)	—
Self-blame (3 items)	—	Accepting responsibility (75%)	Blamed self (67%)
Tension reduction (3 items)	—	—	—
Kept to self (3 items)	—	—	—
Folkman <i>et al.</i> (1986): WOC-R			
Confrontive coping (6 items)	—	—	—
Distancing (6 items)	Detachment (50%)	—	—
Self-controlling (7 items)	—	—	—
Seeking social support (6 items)	Seeking social support (63%)	—	Seeks social support (100%)
Accepting responsibility (4 items)	Self-blame (100%)	—	Blames self (67%)
Escape-avoidance (8 items)	—	—	Avoidance (40%)
Planful problem solving (6 items)	Problem-focused coping (45%)	—	Problem-focused coping (27%)
Positive reappraisal (7 items)	Focus on the positive (75%)	—	—
Vitaliano <i>et al.</i> (1985, 1987): WCCL-R			
Problem-focused (15 items)	Problem-focused coping (55%)	Planful problem solving (67%)	—
Seeks social support (6 items)	Seeking social support (100%)	Seeking social support (71%)	—
Blamed self (3 items)	Self-blame (67%)	Accepting responsibility (67%)	—
Wishful thinking (8 items)	Wishful thinking (100%)	—	—
Avoidance (10 items)	—	Escape-avoidance (50%)	—

Note. The last three columns report the percentage overlap between the scale listed in the column and the scale listed in the corresponding row. In the first row, for example, 83% of the items on Folkman *et al.*'s (1986) planful Problem Solving are also found on Folkman and Lazarus' (1985) problem-Focused Coping scale, whereas 40% of the items on Vitaliano's problem-Focused Coping are found on Folkman and Lazarus' (1985) problem-Focused Coping scale.

his or her most stressful event during the previous week, answer questions regarding what was at stake in the encounter (e.g., self-respect, another's health), and then complete the WOC-R in reference to that stressor. In the *researcher-selected paradigm*, researchers choose the particular stressor to which all participants refer when reporting their coping efforts. For example, Folkman and Lazarus (1985) had participants rate their coping efforts regarding a college exam.

Although each paradigm has generated considerable research, it is unclear whether the two methods produce analogous results. There are at least two reasons why they might not, both having to do with the self-selected paradigm. First, the self-selected paradigm may produce invalid or non-generalizable results because of systematic bias in the types of stressors people tend to report. That is, many factors can systematically affect participants' choice of stressor in the self-selected paradigm, including participants' expectations, demand characteristics, and memory biases. Specifically, demand characteristics may cause individuals to select certain types of stressors based on the researcher's instructions or cues about the purpose of the study. For example, if participants believe that the researcher is interested in *effective coping*, they may be more likely to select events with which they coped well and experienced favorable outcomes. Such a bias in stressor selection can affect the study results by overestimating the associations between coping strategies and outcomes. Participants' expectations, memory biases, and schemas about stressful events may produce a similar biasing of results. Because all participants are referring to the same general event in the researcher-selected paradigm, the possibility of many (but not all) systematic biases is reduced. Therefore, the researcher-selected paradigm may depict the association between coping and outcomes more accurately and may allow researchers to generalize across studies with greater confidence.

The second reason why these two coping paradigms may not produce analogous results is that researchers using the self-selected paradigm may miss associations between coping strategies and outcomes by combining many qualitatively different stressors in one analysis. In the self-selected paradigm, researchers often fail to consider that participants may report coping with drastically different events. For example, some may report how they coped with a flat tire, whereas others may report how they coped with the death of their parents. Combining coping reactions to these stressors in one overall analysis may obscure associations between coping and outcomes that are domain-specific (e.g., controllable vs. uncontrollable stressors). Self-selected stressor studies also make it difficult to estimate potential moderators of coping, unless participants are grouped based on stressor categories (e.g., Folkman and Lazarus, 1985). This issue also makes generalizing results from studies using self-selected stressors hazardous.

In the end, it is an empirical question whether the two paradigms produce similar or different results concerning associations between coping and health outcomes. This question is particularly suited to meta-analysis, however, and one goal of the current analyses was to compare the results from the two commonly used coping paradigms.

## Overview

We conducted a series of meta-analyses investigating the associations between coping strategies and health-related outcomes. Specifically, we examined whether and how the WOC-R and WCCL strategies were differentially associated with measures of physical (e.g., blood pressure) and psychological (e.g., subjective well-being) health in studies of nonclinical adult populations 18 years and older. Although recognizing that this may reduce the power of the current analyses, we excluded clinical samples because we were concerned that many psychological disorders may generate their own sample-specific stressors (see Coyne and Gottlieb, 1996) or that individuals' coping strategies may be affected by psychological disorders. For example, research has suggested that depressives use less problem-focused coping and more emotion-focused coping compared with nondepressives (Billings *et al.*, 1983; Coyne *et al.*, 1981; Folkman and Lazarus, 1986). We excluded samples under 18 years of age because we were concerned that these samples may not have as large or as flexible a coping repertoire as adults. For example, a child or adolescent diagnosed with a chronic disease may not be able to employ certain coping strategies (e.g., making decisions about treatment) and may, therefore rely on alternate strategies, such as wishful thinking or denial.

The purpose of the present analyses was to determine whether there are reliable associations between specific coping strategies and physical and/or psychological health outcomes. Guided by the process approach to coping, we expected that overall associations between coping and health would be moderated by situational characteristics. Specifically, we conducted exploratory analyses to examine variables that some have suggested may moderate these associations, including stressor controllability (e.g., Vitaliano *et al.*, 1990), stressor duration (e.g., Folkman and Lazarus, 1988a; Gottlieb, 1997), and type of stressor (e.g., Folkman and Lazarus, 1980; Pearlin and Schooler, 1978).

## METHOD

### Selection of Studies

We conducted literature searches for published articles in the following computerized databases: ABI (1985–1998), ERIC (1984–1998), CINAHL

(1982–1998), MEDLINE (1966–1997), and PsycINFO (1967–1998). In each search, we used the terms “WCCL,” “WCCL-R,” “WOC,” “WOC-R,” “Ways of Coping Checklist,” “Ways of Coping Questionnaire,” and “Ways of Coping Scale.” We further limited each search to (a) journal articles, (b) English-language research studies, (c) human samples aged 18 and over, and (d) nonclinical samples. Using these criteria, our searches identified 107 unique studies.

Studies had to meet four additional criteria to be included in these analyses. First, studies could not have characteristics that conflicted with the goals of these analyses. For example, several studies included individuals of all ages, without sufficient information to separate the effects for individuals aged 18 and over from those for individuals under 18 years of age. Similarly, several studies combined psychologically disordered and nondisordered samples in their results.

Second, studies had to use one of the two Folkman (Folkman and Lazarus, 1985; Folkman *et al.*, 1986a) WOC-R scales or the Vitaliano *et al.* (1985, 1987) WCCL or WCCL-R scale. We decided to examine only these four measures, as they are among the most represented in the literature. We excluded the original WOC (Folkman and Lazarus, 1980) for two reasons. First, the authors stated that the original factor loadings were no longer available (S. Folkman, personal communication, November 1998). As such, it was impossible to determine whether the problem-focused scale was similar to later factor analyses or on which scale (problem-focused or emotion-focused) the items referring to social support loaded. Second, the broad category of emotion-focused coping obscures differences in the specific strategies that contribute to this scale and prevents examining potential differences in these strategies’ associations with health outcomes.

Third, studies had to include at least one physical or psychological health outcome. Specifically, *outcomes* in these analyses refer to dimensions of physical or psychological health measured after an individual’s reported use of a coping strategy or strategies.<sup>6</sup> Physical health outcomes included both objective outcomes (i.e., outcomes that could be obtained or verified from medical records, such as amount of weight gained between dialysis sessions) and self-reported outcomes (i.e., outcomes obtained from participants’ completing a subjective questionnaire, such as rating one’s own physical health). Psychological health outcomes included only self-reported outcomes, such as Beck Depression Inventory (BDI) scores. Finally, studies had to provide enough information to extract an effect size. These additional criteria reduced the

<sup>6</sup>Many of the studies included in our analyses were cross-sectional rather than longitudinal. As such, although the studies measured coping before measuring a physical or psychological health outcome, we cannot conclude that coping *caused* that specific outcome.

original 107 studies to a total of 34 studies that we were able to include in these analyses.<sup>7</sup>

### Coding

To test for potential moderators of coping's association with health outcomes, two of the authors (J.A.P. and J.S.W.) coded characteristics of the outcome(s) and stressor in each study included in the analyses. Regarding outcomes, we coded each study for type of outcome (i.e., physical vs. psychological).<sup>8</sup> Regarding stressors, we first coded for type, categorizing each stressor as *health-related* (e.g., managing AIDS, compliance with medical regimens), *job-related* (e.g., school stress, retirement), *relationship-related* (e.g., caregiving, widowhood), or *self-selected* (i.e., unspecified stressors chosen by each participant). We also coded each stressor for duration (i.e., acute, chronic, undeterminable) and for controllability (i.e., controllable, uncontrollable, undeterminable). Regarding stressor duration, we coded a stressor as *acute* if it lasted less than approximately 2 weeks (e.g., cardiac surgery, exercise stress test), or as *chronic* if it lasted longer than approximately 2 weeks (e.g., job retirement, diabetes). We coded a stressor as *undeterminable* if there was insufficient information to judge its duration (e.g., self-selected stressor). Regarding stressor controllability, we coded a stressor as *controllable* if we believed that the individual could have avoided, influenced, or regulated the stressor through his or her actions (e.g., adherence to medical regimens). In contrast, we coded a stressor as *uncontrollable* if we believed that the individual could not have avoided or influenced the situation (e.g., widowhood). Finally, we coded a stressor as *undeterminable* if there was insufficient information to judge its controllability. Examples of undeterminable stressors include the self-selected stressors, as well as those stressors that were not elaborated, such as caregiving. In these cases, it was unclear what aspect of the stressor the individual was

<sup>7</sup>Of the 73 studies that we excluded, 44 had no physical or psychological health outcomes, 8 used idiosyncratic factor analyses of the WOC-R, 5 used the original WOC, 6 provided no way to extract effect sizes or to extract an effect size from a subsection of their sample (e.g., only the nonclinical portion of a sample of medical and psychiatric patients), 4 asked participants how they cope with stressors in general (i.e., coping styles), 1 used an unidentifiable stressor, 1 used retrospective coping from childhood, and 1 presented conflicting information between its tables and its text. We were unable to retrieve the remaining three studies despite multiple attempts to contact the authors.

<sup>8</sup>We also coded each physical health outcome for type (i.e., objective or self-reported). To conserve space, we did not include these analyses here because (1) there was only one effect size estimate associated with a self-reported physical health outcome, (2) the test of moderation was significant only for AR and E-A, and (3) meaningful interpretation of moderation with only one effect size in a category is difficult at best. Additional information may be obtained from the first author.

referencing (e.g., physical decline of one's spouse vs. scheduling doctor's appointments).

Overall, the two raters achieved a mean agreement of  $\kappa = .84$ . In cases where the raters disagreed, the decision was made to use the first author's ratings. Additional information about the rating rubric or the resulting codings may be obtained from the first author.

### Effect Size Analysis

We used Pearson's product-moment correlation coefficient ( $r$ ), reflecting the degree of linear association between a given coping strategy and health outcome, as the effect size estimate for each study. If a study did not directly provide an  $r$ -value, we derived  $r$  from the study's available results [e.g.,  $t$  statistic (see Cooper, 1998; Cooper and Hedges, 1994; Hunter and Schmidt, 1990)]. In studies that included one physical and one psychological health outcome, we retained the effect sizes associated with each outcome. In studies that included two or more physical health outcomes, or two or more psychological health outcomes, we included only one effect size for each broad category of health outcome to eliminate the problem of nonindependent effects for the same type of health outcome. Although there are several acceptable methods of avoiding nonindependence (e.g., creating a composite effect size), many require additional information from each study that was unavailable in the current analyses (e.g., intercorrelations between measures). Therefore, we retained the effect corresponding to the measure that was most similar to other studies' measures in these meta-analyses (see Hunter and Schmidt, 1990).

In examining the effect sizes, we first reversed the direction of those negative health outcomes so that all outcomes would be in the same direction, with positive numbers indicating favorable health outcomes. We then transformed each Pearson's  $r$  (raw correlation) into a Fisher's  $z_r$  (transformed correlation) to overcome the skewed  $r$  distribution, which becomes problematic as the absolute value of  $r$  increases (Cooper and Hedges, 1994). Next, we examined the effect size estimates by first computing a weighted transformed correlation for each effect size,  $w_i * z_r$ ,<sup>9</sup> and then calculating the average weighted transformed correlation ( $Z_r$ ) for the entire group of effect size estimates.<sup>10</sup>

To determine whether the group of studies came from the same underlying population, we computed a homogeneity test statistic,  $Q_t$ , for  $Z_r$ . The  $Q_t$  statistic approximates a  $\chi^2$  distribution with  $k-1$  degrees of freedom, where

<sup>9</sup> $w_i * z_i = (n_i - 3) * z_r$ , where  $(n_i - 3)$  is the inverse of the variance for the  $i$ th effect.

<sup>10</sup> $Z_r = \sum[(n_i - 3) * z_i] / \sum(n_i - 3)$ , where  $n_i$  equals the sample size for the  $i$ th effect.

$k$  is the total number of effect sizes. If  $Q_t$  exceeded the corresponding  $\chi^2$  critical value, the group of effect sizes was considered to be heterogeneous (i.e., one or more of the effect sizes came from a different population). If effects are heterogeneous, subsequent significant findings must be interpreted cautiously, as chance or sampling error provides viable alternative explanations for group differences (Cooper, 1998). The last stage of each primary analysis was to calculate the lower and upper bounds of the 95% confidence interval (CI) for the overall  $Z_r$ . If the CI did not include zero, we rejected the null hypothesis and concluded with 95% certainty that the overall association was not due to unknown third variables and that the true population effect size was within the obtained interval.

We then conducted follow-up analyses to test potential moderators of the coping/health association and to account for some of the variability in heterogeneous effect sizes. Here, we examined type of health outcome (i.e., physical vs. psychological), type of stressor (i.e., health-, job-, or relationship-related, self-selected), stressor controllability (i.e., controllable vs. uncontrollable), and stressor duration (i.e., acute vs. chronic). In each analysis, we first divided the studies into two or more subgroups, based on the moderator of interest. We then calculated a within-group homogeneity statistic ( $Q_w$ ) for each subgroup, testing whether the subgroups were homogeneous. Like  $Q_t$ ,  $Q_w$  has a  $\chi^2$  distribution with  $k - 1$  degrees of freedom, where  $k$  is the number of effect sizes in the subgroup; if  $Q_w$  exceeded the corresponding  $\chi^2$  critical value, the subgroup of effect sizes was considered to be heterogeneous (Cooper, 1998). Finally, we computed the between-group homogeneity statistic,  $Q_b$ .<sup>11</sup> The  $Q_b$  statistic also has a  $\chi^2$  distribution with  $p-1$  degrees of freedom, where  $p$  is the number of subgroups. If  $Q_b$  was significant, then the grouping variable explained a significant amount of variance in the effect size estimates and was, thus, considered a moderator of the coping/health association.

## RESULTS

Table II lists the 34 studies that were used in these analyses. This table includes each study's author(s), publication year, and sample size (range, 27 to 323;  $N = 4011$ ; median = 103). Table II also presents the final codings for the four potential moderators. Table III lists the correlation between each coping strategy and health outcome for the 34 studies.<sup>12</sup> In the sections below we present the results for each of the theoretically distinct coping strategies.

<sup>11</sup> $Q_b = Q_t - Q_w$ .

<sup>12</sup>For simplicity, we report only the raw effect size estimates, as there were few instances in which  $z_r$  and  $r$  differed.

**Table II.** Characteristics of All Studies Included in the Meta-Analysis

Study	Author(s)	Year	N	Stressor	Outcome	Potential moderator		
						Health outcome	Stressor type	Stressor controllability
1	Aldwin & Revenson	1987	291	Self-selected	Lager Psychological Symptoms scale	2	4	3
2	Basson & van der Merwe	1994	81	Nursing-school stress and burnout	Maslach Burnout Scale (Emotional Exhaustion subscale)	2	2	3
3 <sup>N</sup>	Christensen <i>et al.</i>	1995	114	Hemodialysis	Interdialytic weight gain	1/1	1/2	1/1
4	Clark & Hovanitz	1989	89	Self-selected	MMPI; Depression (D) scale	2	4	3
5	Conway & Terry	1992	101	Self-selected	Beck Depression Inventory (BDI)	2	4	3
6	Crumlish	1993	28	Cardiac surgery	Postoperative emotional state	2	1	1
7 <sup>N</sup>	Crumlish	1994	120	Cardiac surgery	Profile of Mood States (POMS)	2/2	1/1	1/1
8	Friedland <i>et al.</i>	1996	120	HIV+ Status	Life Appraisal Questionnaire	2	1	3
9	Frost <i>et al.</i>	1994	50	Cardiomyopathy	Psychological Adjustment to Illness Scale (PAIS)	2	1	2
10	Garity	1997	73	Caregiving	Psychological resistance	2	3	1
11	Grummon <i>et al.</i>	1994	27	AIDS	Mental Health Inventory (MHI)	2	1	2
12	Johnson	1994	77	Exercise stress test	POMS	2	1	1
13 <sup>I</sup>	Jones & Johnston	1997	220	School-related	General Health Questionnaire (GHQ)	2/2	2/2	3/3

**Table II.**

14 <sup>N</sup>	Kelley <i>et al.</i>	1996	176	Self-selected		Epstein Barr virus antibody titers & psychological symptomatology	1/2	4/4	3/3	3/3
15	LaMontagne <i>et al.</i>	1992	47	Child's acute critical care situation		State-Trait Anxiety Inventory (STAII)	2	3	2	1
16	Lapp & Collins	1993	323	Self-selected		BDI	2	4	3	3
17 <sup>N</sup>	Leana & Feldman	1995	118	Job layoff		Distress (physiological and psychological) PAIS	1/2	2/2	2/2	2/2
18	Malcarne & Greenbergs	1996	242	Systemic sclerosis		PAIS	2	1	2	2
19	Manne & Zautra	1989	103	Rheumatoid arthritis		MHI	2	1	2	2
20	Manne & Zautra	1990	103	Rheumatoid arthritis		Psychological adjustment	2	1	2	2
21	McMahon <i>et al.</i>	1993	128	Self-selected		Completion of cocaine rehabilitation	1	4	3	3
22	Mikulincer & Florian	1995	97	Early retirement		Personal Fear of Death Scale (Social Identity subscale)	2	2	1	2
23	Narsavage & Weaver	1994	104	Chronic obstructive pulmonary disease		Exercise ability (maximum 12-min walk)	1	1	2	2
24 <sup>N</sup>	Neundorfer	1991	120	Caring for spouse with Alzheimer's		Physical health; Brief Symptom Inventory (BSI; Anxiety scale)	1/2	3/3	3/3	3/3
25	Prattke & Goss-Sternas	1993	75	Artificial insemination		POMS; Total Mood Disorder subscale	2	1	1	1

Table II. (Continued.)

Study	Author(s)	Year	N	Stressor	Outcome	Potential moderator		
						Health outcome	Stressor type	Stressor controllability
26	Ptacek <i>et al.</i>	1995	35	Burns   month post hospitalization	PTSD (DSM III-R criteria)	2	1	2
27	Rapley	1990	97	Diabetes	Glycated (i.e., glycosolated) hemoglobin levels	1	1	1
28	Redeker	1992	129	Coronary artery bypass surgery	Mischel Uncertainty in Illness Scale (Ambiguity subscale)	2	1	1
29	Sander <i>et al.</i>	1997	69	Caregiving	GHO	2	3	2
30	Scheck <i>et al.</i>	1995	91	Self-selected	Life satisfaction	2	4	3
31 <sup>1</sup>	Stewart <i>et al.</i>	1997	100	Heart disease	Hospital readmittance for heart disease	1/1	1/1	1/1
32	Vassend <i>et al.</i>	1997	104	HIV+ status	Developing AIDS	1	1	3
33 <sup>1</sup>	Vitaliano <i>et al.</i>	1987	251	Self-selected	BDI	2/2	4/4	3/3
34	Voyer & Vézina	1995	108	Widowhood	BSI	2	3	2

Note. Cells with values separated by a slash indicate that the study included two dimensions of that variable (i.e., contributed two effect sizes). <sup>1</sup>Independent effect sizes (i.e., independent samples). <sup>N</sup>Nonindependent effect sizes (i.e., nonindependent samples). Health outcome: 1 = physical; 2 = psychological. Stressor: 1 = health-related; 2 = job-related; 3 = relationship-related; 4 = self-selected. Controllability of stressor: 1 = controllable; 2 = uncontrollable; 3 = could not determine (included only 1 and 2 in analyses). Duration of stressor: 1 = acute; 2 = chronic; 3 = could not determine (included only 1 and 2 in analyses).

**Table III.** Correlations Between Coping and Health Outcomes by Study

Study	CC	D	S-C	SSS	A-R	PPS	E-A	PR	WT	VPFC	VA
Aldwin Revenson (1987)	<b>-.21</b>	-.06	-.29	<b>-.27</b>	<b>-.26</b>	.00	<b>-.63</b>	<b>-.21</b>	<b>-.37</b>		
Basson & van der Merwe (1994)	<b>-.36 / -.36</b>	<b>.01</b>	<b>-.12</b>	<b>.06 / .33</b>	<b>-.05 / -.36</b>	<b>.09</b>	<b>.29 / .13</b>	<b>.16</b>	<b>.35</b>	<b>-.09 / -.14</b>	<b>-.37</b>
Christensen <i>et al.</i> (1995)											
Clark & Hovanitz (1989)											
Conway & Terry (1992)											
Crumlish (1993)											
Crumlish (1994)											
Friedland <i>et al.</i> (1996)											
Frost <i>et al.</i> (1994)	.00	.21	.00	.00	.00	<b>.20</b>	<b>.43</b>	.00	.00	.00	
Garity (1997)	.01	.22	.14	.01	.20	<b>.30</b>	<b>.26</b>	.18			
Grummon <i>et al.</i> (1994)	-.15	-.29	<b>-.29</b>	.09	-.03	.04	-.28	-.01			
Johnson (1994)	<b>-.34</b>	-.13	<b>-.38</b>	<b>-.16</b>	<b>-.22</b>	<b>-.05</b>	<b>-.32</b>	<b>-.13</b>			
Jones & Johnston (1997)											
Kelley <i>et al.</i> (1996)											
LaMontagne <i>et al.</i> (1992)	-.25	.08	-.05	.29	-.22	<b>.31</b>	<b>.42</b>	.01	<b>.34</b>	.02	<b>-.41</b>
Lapp & Collins (1993)											
Leana & Feldman (1995)											
Malcarne & Greenbergs (1996)											
Manne & Zautra (1989)											
Manne & Zautra (1990)											
McMahon <i>et al.</i> (1993)	-.11	.00	<b>-.33</b>	<b>-.21</b>	.09	.00	.00	-.08			
Mikulincer & Florian (1995)											
Narsavage & Weaver (1994)	.00	.00	.00	<b>-.37</b>	<b>-.21 / -.28</b>	<b>.29</b>	<b>.00</b>	<b>.00</b>			
Neundorfer (1991)	<b>-.22 / -.59</b>	<b>-.28</b>	<b>-.34</b>	<b>-.38</b>	<b>-.09</b>	<b>-.36</b>	<b>-.07</b>	<b>-.51</b>	<b>-.22 / -.55</b>	<b>-.08 / -.11</b>	
Prattke & Grass-Sterns (1993)											
Placek <i>et al.</i> (1995)											
Rapley (1990)											
Redeker (1992)											
Sander <i>et al.</i> (1997)											
Scheck <i>et al.</i> (1995)											
Stewart <i>et al.</i> (1997)	.29 / .00	.00 / .00	-.12 / .20	<b>-.47 / -.10</b>	<b>-.23 / .50</b>	<b>-.32 / -.21</b>	<b>.14</b>	<b>.15</b>	<b>.08 / .06</b>	<b>-.12</b>	
Vassend <i>et al.</i> (1997)	.21	.00	.19	.19	<b>.28</b>	<b>-.11</b>	<b>.29</b>	<b>.32</b>			
Vitaliano <i>et al.</i> (1987)											
Voyer & Vézina (1995)	<b>-.25</b>	-.05	<b>-.38</b>	<b>-.30</b>	<b>-.30</b>	<b>-.29</b>	<b>-.44</b>	<b>-.36</b>	<b>.43 / -.38</b>	<b>.16 / .21</b>	<b>-.30 / -.34</b>

Note. Values are Pearson's correlation coefficients (*r*); values in bold face are significant (*p* < .05). Cells with values separated by a slash indicate that the study contributed two effect sizes to the present analyses. Empty cells indicate that the study did not include that coping strategy. CC, confrontive coping; D, distancing; S-C, self-control; SSS, seeking social support; A-R, accepting responsibility; PPS, planful problem solving; PR, positive reappraisal; WT, wishful thinking; VPFC, Vitaliano's problem-focused coping; VA, Vitaliano's avoidance.

### Confrontive Coping

For confrontive coping, 15 studies generated 18 samples, with 2 studies generating two nonindependent samples each (i.e., repeated-measures designs) and 1 study generating two independent samples (i.e., between-groups design). Of the 18 samples, 7 revealed reliable associations between confrontive coping and health (i.e., their confidence intervals did not include 0). Table IV presents our results examining the association between confrontive coping and health outcomes; although the samples were heterogeneous, they demonstrated a significant overall association between the two variables ( $r = -.15$ ;  $CI_{.95} = -.21 \leq r \leq -.10$ ).

Follow-up analyses revealed that type of health outcome moderated this association [ $Q_{b(1)} = 8.39$ ,  $p < .05$ ], with confrontive coping being significantly correlated with psychological health outcomes ( $r = -.22$ ) but not with physical health outcomes. Type of stressor was also a significant moderator [ $Q_{b(2)} = 6.39$ ,  $p < .05$ ], with confrontive coping being more strongly associated with health outcomes for relationship-related stressors ( $r = -.26$ ) than for either health-related or self-selected stressors ( $r$ 's =  $-.10$  and  $-.15$ , respectively). Finally, stressor duration moderated the overall association [ $Q_{b(1)} = 9.67$ ,  $p < .05$ ], with confrontive coping being significantly correlated with health outcomes for acute stressors ( $r = -.26$ ) but not for chronic stressors. Stressor controllability did not moderate the overall association between confrontive coping and health in the present samples.

### Distancing

For distancing, 17 studies generated 21 samples, with 2 studies generating two nonindependent samples each and 2 studies generating two independent samples each. Of the 21 samples, 2 revealed reliable associations between distancing and health outcomes. Table V presents our results examining the association between distancing and health outcomes; although the samples were heterogeneous, they demonstrated a significant overall association between the two variables ( $r = -.06$ ;  $CI_{.95} = -.11 \leq r \leq -.01$ ). Follow-up analyses revealed that only stressor controllability moderated the overall association [ $Q_{b(2)} = 5.79$ ,  $p < .05$ ], with distancing being significantly associated with health outcomes for controllable stressors but not for uncontrollable stressors ( $r$ 's =  $-.20$  and  $-.02$ , respectively).

### Self-Control

For self-control, 15 studies generated 18 samples, with 2 studies generating two nonindependent samples each and 1 study generating two

**Table IV.** Associations Between Confrontive Coping and Health Outcomes

	<i>k</i>	<i>N</i>	<i>r</i>	<i>Z<sub>r</sub></i>	CI, lower	CI, upper	<i>Q<sub>i</sub></i>	<i>p</i>	<i>Q<sub>b</sub></i>	<i>p</i>	<i>Q<sub>w</sub></i>	<i>p</i>
Overall association	18	1472	-.15	-.21	-.10	.55-.42	<.05	8.39	<.05	22.47	<.05	
Type of health outcome										24.56	<.05	
Physical	8	575	-.06	-.14	.03					30.37	<.05	
Psychological	10	897	-.22	-.28	-.15					15.23	<.05	
Type of stressor										3.43	ns	
Health-related	10	616	-.10	-.18	-.01							
Relationship-related	5	348	-.26	-.38	-.16							
Self-selected	3	508	-.15	-.24	-.06							
Controllability of stressor												
Controllable	5	303	-.19	-.31	-.07							
Uncontrollable	5	354	-.16	-.27	-.05							
Duration of stressor												
Acute	7	476	-.26	-.36	-.17							
Chronic	6	368	.07	.07	.18							
									21.99	<.05	7.06	ns
									5.77	ns		

Note. None of the studies included job-related stressors.

**Table V.** Associations Between Distancing and Health Outcomes

	<i>k</i>	<i>N</i>	<i>r</i>	<i>Z<sub>r</sub></i>	CI, lower	CI, upper	<i>Q<sub>t</sub></i>	<i>p</i>	<i>Q<sub>b</sub></i>	<i>p</i>	<i>Q<sub>w</sub></i>	<i>p</i>
Overall association	21	1811	-.06	-.06	-.11	-.01	80.25	<.05	1.24	ns	2.07	ns
Type of health outcome											25.92	<.05
Physical	7	538	-.02	-.02	-.11	.07						
Psychological	14	1273	-.08	-.08	-.13	-.02						
Type of stressor												
Health-related	8	520	-.06	-.06	-.16	.03					12.22	ns
Job-related	5	435	-.15	-.15	-.25	-.05					5.91	ns
Relationship-related	5	348	.05	.05	-.06	.16					3.21	ns
Self-selected	3	508	-.06	-.06	-.14	.03					<1	ns
Controllability of stressor												
Controllable	5	349	-.20	-.20	-.31	-.09					7.58	ns
Uncontrollable	6	427	-.02	-.02	-.12	.08					5.33	ns
Duration of stressor												
Acute	4	272	-.06	-.06	-.19	.06					12.77	<.05
Chronic	12	911	-.07	-.07	-.14	-.01					14.80	ns

independent samples. Of the 18 samples, 5 revealed reliable associations between self-control and health outcomes. Table VI presents our results examining the association between self-control and health outcomes; although the samples were heterogeneous, they demonstrated a significant overall association between the two variables ( $r = -.10$ ;  $CI_{.95} = -.15 \leq r \leq -.04$ ). Follow-up analyses demonstrated that only type of health outcome moderated this association [ $Q_{b(1)} = 58.84$ ,  $p < .05$ ], with self-control being positively correlated with physical health outcomes and negatively correlated with psychological health outcomes ( $r = .11$  and  $-.23$ , respectively).

### Seeking Social Support

For seeking social support, 26 studies generated 33 samples, with 4 studies generating two nonindependent samples each and 3 studies generating two independent samples each. Of the 33 samples, 12 revealed reliable associations between seeking social support and health outcomes. Table VII presents our results examining the association between seeking social support and health outcomes; although the samples were heterogeneous, they demonstrated a significant overall association between the two variables ( $r = -.04$ ;  $CI_{.95} = -.07 \leq r \leq .004$ ).

Follow-up analyses demonstrated that type of stressor moderated the association between seeking social support and health outcomes [ $Q_{b(3)} = 27.01$ ,  $p < .05$ ], with seeking social support being significantly correlated with health outcomes for job-related, relationship-related, and self-selected stressors ( $r$ 's =  $.21$ ,  $-.14$ , and  $-.10$ , respectively) but not for health-related stressors. Stressor controllability also moderated the overall association [ $Q_{b(1)} = 4.50$ ,  $p < .05$ ], with seeking social support being significantly correlated with health outcomes for controllable stressors ( $r = -.14$ ) but not for uncontrollable stressors. Finally, stressor duration moderated the overall association [ $Q_{b(1)} = 15.98$ ,  $p < .05$ ], with seeking social support being significantly correlated with health outcomes for acute stressors ( $r = -.10$ ) but not for chronic stressors. Type of health outcome did not moderate the overall association between seeking social support and health outcomes in the present samples.

### Accepting Responsibility

For accepting responsibility, 23 studies generated 27 samples, with 2 studies generating two nonindependent samples each and 2 studies generating two independent samples each. Of the 27 samples, 11 revealed reliable

**Table VI.** Associations Between Self-Control and Health Outcomes

	<i>k</i>	<i>N</i>	<i>r</i>	<i>Z<sub>r</sub></i>	CI, lower	CI, upper	<i>Q<sub>t</sub></i>	<i>p</i>	<i>Q<sub>b</sub></i>	<i>p</i>	<i>Q<sub>w</sub></i>	<i>p</i>
Overall association	18	1478	-.10	-.10	-.15	-.04	73.39	<.05	58.84	<.05	6.84	ns
Type of health outcome											38.48	<.05
Physical	8	582	.11	.11	.02	.19						
Psychological	10	896	-.23	-.23	-.30	-.16						
Type of stressor											3.14	ns
Health-related	10	623	-.04	-.04	-.12	.04					35.49	<.05
Relationship-related	5	348	-.14	-.14	-.25	-.03					15.82	<.05
Self-selected	3	507	-.14	-.14	-.22	-.05					18.93	<.05
Controllability of stressor												
Controllable	5	309	-.16	-.16	-.28	-.05					18.47	<.05
Uncontrollable	5	355	-.09	-.09	-.20	.02					19.31	<.05
Duration of stressor												
Acute	6	375	-.09	-.09	-.20	.01					26.97	<.05
Chronic	7	476	-.06	-.06	-.15	.04					23.29	ns

Note. None of the studies included job-related stressors.

**Table VII.** Associations Between Seeking Social Support and Health Outcomes

	<i>k</i>	<i>N</i>	<i>r</i>	<i>Z<sub>r</sub></i>	CI <sub>lower</sub>	CI <sub>upper</sub>	<i>Q<sub>t</sub></i>	<i>p</i>	<i>Q<sub>b</sub></i>	<i>p</i>	<i>Q<sub>w</sub></i>	<i>p</i>
Overall association	33	3315	-.04	-.04	-.07	-.004	160.84	<.05	1.54	ns	18.67	<.05
Type of health outcome											140.62	<.05
Physical	10	766	-.08	-.08	-.15	-.01						
Psychological	23	2549	-.03	-.03	-.07	.01						
Type of stressor											27.01	<.05
Health-related	17	1393	-.02	-.02	-.07	.04					56.29	<.05
Job-related	3	317	.21	.21	.10	.32					25.05	<.05
Relationship-related	5	348	-.14	-.14	-.25	-.03					16.74	<.05
Self-selected	8	1257	-.10	-.10	-.15	-.04					35.74	<.05
Controllability of stressor												
Controllable	7	503	-.14	-.14	-.23	-.04					8.10	ns
Uncontrollable	11	1028	-.02	-.02	-.08	.05					54.49	<.05
Duration of stressor												
Acute	10	771	-.10	-.10	-.18	-.03					20.15	<.05
Chronic	13	1167	.09	.09	.03						73.12	<.05

associations between accepting responsibility and health outcomes. Table VIII presents our results examining the association between accepting responsibility and health outcomes; although the samples were heterogeneous, they demonstrated a significant overall association between the two variables ( $r = -.16$ ;  $CI_{.95} = -.20 \leq r \leq -.12$ ).

Follow-up analyses demonstrated that type of health outcome moderated the overall association [ $Q_{b(1)} = 41.64, p < .05$ ], with accepting responsibility being significantly correlated with psychological health outcomes ( $r = -.22$ ) but not with physical health outcomes. Type of stressor also moderated the overall association [ $Q_{b(3)} = 9.46, p < .05$ ], with accepting responsibility being significantly correlated with health outcomes for health-related, relationship-related, and self-selected stressors ( $r$ 's =  $-.13$ ,  $-.17$ , and  $-.21$ , respectively) but not for job-related stressors. Stressor controllability also moderated the overall association [ $Q_{b(1)} = 5.68, p < .05$ ], with accepting responsibility being significantly correlated with health outcomes for uncontrollable stressors ( $r = -.21$ ) but not for controllable stressors. Finally, stressor duration moderated the association between accepting responsibility and health outcomes [ $Q_{b(1)} = 9.24, p < .05$ ], with accepting responsibility being significantly correlated with health outcomes for acute stressors ( $r = -.21$ ) but not for chronic stressors.

### **Planful Problem Solving**

For planful problem solving, 20 studies generated 23 samples, with 2 studies generating two nonindependent samples each and 1 study generating two independent samples. Of the 23 samples, 7 revealed reliable associations between planful problem solving and health outcomes. Table IX presents our results examining the association between planful problem solving and health outcomes; the heterogeneous samples did not demonstrate a significant association between the two variables ( $r = .02$ ;  $CI_{.95} = -.03 \leq r \leq .06$ ). Follow-up analyses did not reveal any significant moderators of the association between planful problem solving and health outcomes in the present samples.

### **Escape Avoidance**

For escape-avoidance, 14 studies generated 16 samples, with 1 study generating two nonindependent samples and 1 study generating two independent samples. Of the 16 samples, 9 revealed reliable associations between escape-avoidance and health outcomes. Table X presents our results

**Table VIII.** Associations Between Accepting Responsibility and Health Outcomes

	<i>k</i>	<i>N</i>	<i>r</i>	<i>Z<sub>r</sub></i>	CI, lower	CI, upper	<i>Q<sub>t</sub></i>	<i>p</i>	<i>Q<sub>b</sub></i>	<i>p</i>	<i>Q<sub>w</sub></i>	<i>p</i>
Overall association	27	2802	-.16	-.16	-.20	-.12	111.72	<.05	41.64	<.05	25.90	<.05
Type of health outcome												
Physical	7	576	.08	.08	-.001	.17					44.18	<.05
Psychological	20	2226	-.22	-.22	-.27	-.19						
Type of stressor												
Health-related	15	1291	-.13	-.13	-.18	-.07					73.59	<.05
Job-related	1	81	.09	.09	-.14	.32						
Relationship-related	5	348	-.17	-.17	-.28	-.06					12.66	<.05
Self-selected	6	1082	-.21	-.21	-.28	-.15					16.02	<.05
Controllability of stressor												
Controllable	5	349	-.06	-.06	-.17	.05					31.88	<.05
Uncontrollable	10	983	-.21	-.21	-.28	-.15					22.19	<.05
Duration of stressor												
Acute	7	669	-.21	-.21	-.29	-.13					19.90	<.05
Chronic	13	931	-.05	-.05	-.12	.02					59.33	<.05

**Table IX.** Associations Between Planful Problem Solving and Health Outcomes

	<i>k</i>	<i>N</i>	<i>r</i>	<i>Z<sub>r</sub></i>	CI, lower	CI, upper	<i>Q<sub>t</sub></i>	<i>p</i>	<i>Q<sub>b</sub></i>	<i>p</i>	<i>Q<sub>w</sub></i>	<i>p</i>
Overall effect	23	1941	.02	-.03	.06	64.83	<.05	<1	ns	21.80	<.05	
Type of health outcome										43.00	<.05	
Physical	8	587	.03	-.06	.11							
Psychological	15	1354	.02	-.04	.07							
Type of stressor												
Health-related	10	628	-.02	-.10	.06					32.20	<.05	
Job-related	2	178	.05	-.10	.20					<1	ns	
Relationship-related	6	417	-.03	-.13	.07					23.34	<.05	
Self-selected	5	718	.07	.07	-.005					5.12	ns	
Controllability of stressor												
Controllable	6	400	-.03	-.13	.08					11.90	<.05	
Uncontrollable	6	435	.00	-.10	.09					33.90	<.05	
Duration of stressor												
Acute	7	449	.11	.11	.02	.21				11.52	<.05	
Chronic	10	774	-.03	-.03	-.10	.04				40.79	<.05	

**Table X.** Associations Between Escape-Avoidance and Health Outcomes

	<i>k</i>	<i>N</i>	<i>r</i>	<i>Z<sub>r</sub></i>	CI, lower	CI, upper	<i>Q<sub>t</sub></i>	<i>p</i>	<i>Q<sub>b</sub></i>	<i>p</i>	<i>Q<sub>w</sub></i>	<i>p</i>
Overall association	16	1376	-.31	-.32	-.38	-.27	135.19	<.05	85.13	<.05		
Type of health outcome												
Physical	6	479	.02	.02	-.07	.12					12.13	<.05
Psychological	10	897	-.47	-.51	-.57	-.44					39.93	<.05
Type of stressor												
Health-related	8	520	-.08	-.08	-.17	.01					38.60	<.05
Relationship-related	5	348	-.39	-.41	-.52	-.30					6.39	ns
Self-selected	3	508	-.47	-.51	-.60	-.42					40.03	<.05
Controllability of stressor												
Controllable	4	252	-.23	-.23	-.36	-.10					18.76	<.05
Uncontrollable	4	309	-.23	-.23	-.35	-.12					16.00	<.05
Duration of stressor												
Acute	4	272	-.38	-.40	-.52	-.27					3.50	ns
Chronic	7	476	-.05	-.05	-.14	.04					32.94	<.05

Note. None of the studies included job-related stressors.

examining the association between escape-avoidance and health outcomes; although the samples were heterogeneous, they demonstrated a significant overall association between the two variables ( $r = -.31$ ;  $CI_{.95} = -.38 \leq r \leq -.27$ ).

Follow-up analyses demonstrated that type of health outcome moderated this association [ $Q_{b(1)} = 85.13$ ,  $p < .05$ ], with escape-avoidance being significantly correlated with psychological health outcomes ( $r = -.47$ ) but not with physical health outcomes. Type of stressor also moderated the overall association [ $Q_{b(3)} = 50.17$ ,  $p < .05$ ], with escape-avoidance being significantly correlated with health outcomes for relationship-related and self-selected stressors ( $r's = -.39$  and  $-.47$ , respectively) but not with health outcomes for health-related stressors. Stressor duration also moderated this association [ $Q_{b(1)} = 20.07$ ,  $p < .05$ ], with escape-avoidance being significantly correlated with health outcomes for acute stressors ( $r = -.40$ ) but not for chronic stressors. Stressor controllability did not moderate the association between escape-avoidance and health outcomes in the present samples.

### **Positive Reappraisal**

For positive reappraisal, 15 studies generated 18 samples, with 2 studies generating two nonindependent samples each and 1 study generating two independent samples. Of the 18 samples, 3 revealed reliable associations between positive reappraisal and health outcomes. Table XI presents our results examining the association between positive reappraisal and health outcomes; the heterogeneous samples did not demonstrate a significant overall association between the two variables ( $r = -.05$ ;  $CI_{.95} = -.10 \leq r \leq .00$ ).

Follow-up analyses demonstrated that type of health outcome moderated the association between positive reappraisal and health outcomes [ $Q_{b(1)} = 5.04$ ,  $p < .05$ ], with positive reappraisal being significantly correlated with psychological health outcomes ( $r = -.10$ ) but not with physical health outcomes. Type of stressor also moderated the overall association [ $Q_{b(2)} = 6.30$ ,  $p < .05$ ], with positive reappraisal being significantly correlated with health outcomes for relationship-related stressors and self-selected stressors ( $r = -.11$  and  $-.10$ , respectively) but not for health-related stressors. Neither stressor controllability nor stressor duration moderated the association between positive reappraisal and health outcomes in the present samples.

### **Wishful Thinking**

For wishful thinking, 12 studies generated 14 samples, with 1 study generating two nonindependent samples and 1 study generating two

**Table XI.** Associations Between Positive Recategorization and Health Outcomes

	<i>k</i>	<i>N</i>	<i>r</i>	<i>Z<sub>r</sub></i>	CI, lower	CI, upper	<i>Q<sub>t</sub></i>	<i>p</i>	<i>Q<sub>b</sub></i>	<i>p</i>	<i>Q<sub>w</sub></i>	<i>p</i>
Overall association	18	1490	-.05	-.05	-.10	.003	61.82	<.05	5.04	<.05	11.25	ns
Type of health outcome											26.36	<.05
Physical	8	593	.02	.02	-.06	.11						
Psychological	10	897	-.10	-.10	-.17	-.03						
Type of stressor												
Health-related	10	634	.03	.03	-.05	.11						
Relationship-related	5	348	-.11	-.11	-.22	-.003					14.22	<.05
Self-selected	3	508	-.10	-.10	-.19	-.01					9.91	<.05
Controllability of stressor												
Controllable	5	309	-.01	-.01	-.13	.11					2.44	ns
Uncontrollable	5	366	-.13	-.13	-.24	-.03					2.45	ns
Duration of stressor												
Acute	6	386	-.01	-.01	-.12	.09					5.33	<.05
Chronic	7	476	-.01	-.01	-.11	.08					24.67	ns

Note. None of the studies included job-related stressors.

independent samples. Of the 14 samples, 11 revealed reliable associations between wishful thinking and health outcomes. Table XII presents our results examining the association between wishful thinking and health outcomes; although the samples were heterogeneous, they demonstrated a significant overall association between the two variables ( $r = -.42$   $CI_{.95} = -.47 \leq r \leq -.37$ ).

Follow-up analyses revealed that type of health outcome moderated this association [ $Q_{b(1)} = 17.53$ ,  $p < .05$ ], with wishful thinking being significantly correlated with psychological health outcomes ( $r = -.42$ ) but not with physical health outcomes. Type of stressor also moderated the overall association [ $Q_{b(3)} = 6.82$ ,  $p < .05$ ], with wishful thinking being more strongly associated with health outcomes for health-related stressors than for job-related or self-selected stressors ( $r$ 's =  $-.45$ ,  $-.36$ , and  $-.33$ , respectively). Finally, stressor controllability also moderated the overall association [ $Q_{b(1)} = 23.55$ ,  $p < .05$ ], with wishful thinking being significantly associated with health outcomes for uncontrollable stressors ( $r = -.49$ ) but not for controllable stressors. Stressor duration did not moderate the overall association between wishful thinking and health outcomes in the present samples.

### **Vitaliano's Problem-Focused Coping**

For problem-focused coping, 10 studies generated 13 samples, with 2 studies generating two nonindependent samples each and 1 study generating two independent samples. Of the 13 samples, 5 revealed reliable associations between problem-focused coping and health outcomes. Table XIII presents our results examining the association between problem-focused coping and health outcomes; although the samples were heterogeneous, they demonstrated a significant overall association between the two variables ( $r = .08$ ;  $CI_{.95} = .03 \leq r \leq .13$ ).

Follow-up analyses demonstrated that type of health outcome moderated the overall association [ $Q_{b(1)} = 4.01$ ,  $p < .05$ ], with problem-focused coping being significantly correlated with psychological health outcomes ( $r = .10$ ) but not with physical health outcomes. Stressor duration also moderated the overall association [ $Q_{b(1)} = 34.85$ ,  $p < .05$ ], with problem-focused coping being positively correlated with health outcomes for chronic stressors ( $r = .31$ ) but negatively correlated with health outcomes for acute stressors ( $r = -.11$ ). Neither type of stressor nor stressor controllability moderated the association between problem-focused coping and health outcomes in the present samples.

**Table XII.** Associations Between Wishful Thinking and Health Outcomes

	<i>k</i>	<i>N</i>	<i>r</i>	<i>Z<sub>r</sub></i>	CI, lower	CI, upper	<i>Q<sub>t</sub></i>	<i>p</i>	<i>Q<sub>b</sub></i>	<i>p</i>	<i>Q<sub>w</sub></i>	<i>p</i>
Overall association	14	1723	-.42	-.45	-.47	-.37	46.82	<.05	17.53	<.05		
Type of health outcome												
Physical	1	97	.00	.00	-.21	.21						
Psychological	13	1626	-.42	-.44	-.49	-.39					29.29	<.05
Type of stressor												
Health-related	9	977	-.45	-.48	-.54	-.41					34.15	<.05
Job-related	1	81	-.36	-.38	-.61	-.15						
Self-selected	4	665	-.33	-.34	-.42	-.27					5.85	ns
Controllability of stressor												
Controllable	1	97	.00	.00	-.21	.21						
Uncontrollable	8	880	-.49	-.53	-.60	-.46					10.61	ns
Duration of stressor												
Acute	4	397	-.48	-.52	-.62	-.41					9.09	<.05
Chronic	6	661	-.42	-.44	-.52	-.36					24.32	<.05

Note. None of the studies included relationship-related stressors.

**Table XIII.** Associations Between Vitaliano's Problem-Focused Coping and Health Outcomes

	<i>k</i>	<i>N</i>	<i>r</i>	<i>Z<sub>r</sub></i>	CI, lower	CI, upper	<i>Q<sub>t</sub></i>	<i>p</i>	<i>Q<sub>b</sub></i>	<i>p</i>	<i>Q<sub>w</sub></i>	<i>p</i>
Overall association	13	1622	.08	.03	.13	.77.94	<.05	4.01	<.05	<1	73.17	ns <.05
Type of health outcome												
Physical	2	185	-.06	-.21	.09							
Psychological	11	1437	.10	.04	.15							
Type of stressor												
Health-related	7	771	.10	.03	.18							
Self-selected	6	851	.06	-.01	.13							
Controllability of stressor												
Controllable	1	97	.00	-.21	.21							
Uncontrollable	5	432	-.08	-.18	.02							
Duration of stressor												
Acute	4	397	-.11	-.21	-.01							
Chronic	3	374	.31	.32	.22	.43						
							34.85	<.05				
									12.89	<.05		
											8.91	<.05
											14.42	<.05

Note. None of the studies included job-related stressors or relationship-related stressors.

### Vitaliano's Avoidance

For avoidance, eight studies generated 10 samples, with one study generating two nonindependent samples and one study generating two independent samples. Of the 10 samples, 7 revealed reliable associations between avoidance and health outcomes. Table XIV presents our results examining the association between avoidance and health outcomes; although the samples were heterogeneous, they demonstrated a significant overall association between the two variables ( $r = -.34$  CI<sub>.95</sub> =  $-.40 \leq r \leq -.29$ ).

Follow-up analyses demonstrated that type of health outcome moderated the overall association [ $Q_{b(1)} = 11.89, p < .05$ ], with avoidance being significantly correlated with psychological health outcomes ( $r = -.36$ ) but not with physical health outcomes. Stressor controllability also moderated the overall association [ $Q_{b(1)} = 9.81, p < .05$ ], with avoidance being significantly correlated with health outcomes for uncontrollable stressors ( $r = -.33$ ) but not for controllable stressors. Finally, stressor duration moderated the overall association [ $Q_{b(1)} = 13.53, p < .05$ ], with avoidance being more strongly associated with health outcomes for acute stressors than for chronic stressors ( $r = -.41$  and  $-.16$ , respectively). Type of stressor did not moderate the association between avoidance and health outcomes in the present samples.

## DISCUSSION

### Overall Associations Between Coping and Health Outcomes

The present meta-analyses examined the associations between coping strategies and health. Our results frequently revealed reliable associations between individual coping strategies and health outcomes. In general, the emotion-focused coping strategies demonstrated small to moderate overall associations with health outcomes, with effect sizes ranging from  $-.05$  (ns) for positive reappraisal to  $-.42(p < .05)$  for wishful thinking [see Cohen (1992) for a discussion of effect size magnitude]. Of the seven emotion-focused strategies, six demonstrated significant negative overall associations with health (i.e., distancing, self-control, accepting responsibility, wishful thinking, and the two avoidance scales). That is, participants who reported using these strategies also reported experiencing negative health outcomes. The exception to the negative associations we found between emotion-focused coping and health outcomes was positive reappraisal, which was not significantly associated with overall health outcomes in our analyses.

**Table XIV.** Associations Between Vitaliano's Avoidance and Health Outcomes

	<i>k</i>	<i>N</i>	<i>r</i>	<i>Z<sub>r</sub></i>	CI, lower	CI, upper	<i>Q<sub>t</sub></i>	<i>p</i>	<i>Q<sub>b</sub></i>	<i>p</i>	<i>Q<sub>w</sub></i>	<i>p</i>
Overall association	10	1345	-.34	-.36	-.40	-.29	30.64	<.05	11.89	<.05		
Type of health outcome												
Physical	1	97	.00		-.21	.21						
Psychological	9	1248	-.36	-.37	-.43	-.31						
Type of stressor												
Health-related	7	771	-.30	-.30	-.37	-.23						
Self-selected	3	574	-.38	-.40	-.48	-.31						
Controllability of stressor												
Controllable	1	97	.00		-.21	.21						
Uncontrollable	6	674	-.33	-.35	-.42	-.27						
Duration of stressor												
Acute	4	397	-.41	-.43	-.53	-.33						
Chronic	3	374	-.16	-.16	-.27	-.06						

Note. None of the studies included job-related stressors or relationship-related stressors.

The problem-focused coping strategies demonstrated small overall associations with health outcomes, with effect sizes ranging from  $-.15$  ( $p < .05$ ) for confrontive coping to  $.08$  ( $p < .05$ ) for Vitaliano's problem-focused coping. In other words, participants who reported using confrontive coping reported experiencing negative health outcomes, whereas those who reported using Vitaliano's problem-focused coping reported experiencing positive health outcomes. Folkman's planful problem solving was not significantly associated with overall health outcomes in the present analyses.

Finally, seeking social support, which includes both emotion-focused and problem-focused strategies, demonstrated a small negative overall association with health outcomes ( $r = -.04$ ,  $p < .05$ ). That is, participants who reported seeking social support on average also reported experiencing negative health outcomes. Our moderational analyses, however, revealed that one should qualify interpretations of each of the overall associations between coping and health outcomes.

### **Individual Coping Strategies and Health**

*Confrontive Coping.* The results for confrontive coping suggested that this coping strategy was negatively associated with overall health outcomes. Examining type of health outcome, however, revealed that confrontive coping was associated primarily with psychological health outcomes in our analyses. The negative association between confrontive coping and psychological health is consistent with researchers who have suggested that confrontive coping leads to increased psychological distress (e.g., Aldwin and Revenson, 1987; O'Brien and DeLongis, 1997) and negative affectivity (e.g., Folkman and Lazarus, 1988b), perhaps because it can make a situation worse or result in strained interpersonal associations (e.g., Folkman and Lazarus, 1986, 1988b). The exception to the negative associations with confrontive coping in our analyses was that it was not significantly correlated with physical health outcomes in chronic stressors.

The moderating analyses revealed that confrontive coping was consistently (negatively) correlated with psychological health across a range of stressors. There are at least two possible explanations for this finding. First, because of confrontive coping's hostile approach to stressful situations, the strategy frequently results in deteriorated social associations (see Folkman and Lazarus, 1988b). The negative correlation between confrontive coping and psychological health in the current analyses may have been due to the fact that most of the stressors had interpersonal dimensions (e.g., caregiving). Second, individuals typically use confrontive coping when they perceive a strong threat to themselves or to loved ones (Folkman *et al.*, 1986a). In other

words, individuals may already have felt severe distress that confrontive coping may not relieve (see Aldwin and Revenson, 1987).

*Distancing.* The results for distancing suggested that this coping strategy was negatively associated with overall health outcomes. Like confrontive coping, however, distancing was related primarily to psychological health outcomes in our analyses. The negative correlation between distancing and psychological health is consistent with previous researchers who have suggested that distancing leads to poor psychological adjustment (Folkman *et al.*, 1986b; Pearlin and Schooler, 1978) and negative affectivity (Folkman and Lazarus, 1988b) because it is usually associated with poor situational outcomes which, over time, can lead to psychological maladjustment (e.g., Folkman and Lazarus, 1986).

However, the nonsignificant association between distancing and physical health is inconsistent with previous researchers' suggestions. For example, Lazarus (1991) has suggested that distancing, along with denial and avoidance, may be deleterious to physical health, as it may cause people to delay medical treatment or may encourage other damaging behaviors, such as increased alcohol or drug use.<sup>13</sup> It may be that the negative association researchers have previously found between distancing and health was moderated by additional factors that the current meta-analyses could not measure, such as age and socioeconomic status. For example, Folkman and Lazarus (1988a) found that distancing was associated with negative affect only in younger individuals. The authors suggested that this might have been due to the types of stressful events that participants reported (e.g., younger participants reported more job-related stressors, whereas older participants reported more health-related stressors) or to developmental changes in coping efficacy (e.g., older participants may have better interpersonal skills and be more able to cope with interpersonal stressors). The negative association between coping and health outcomes for job-related stressors in our analyses, and the nonsignificant association between distancing and health-related stressors, provides some support for this hypothesis. In addition, the effect sizes in the current analyses that were associated with exclusively younger or older samples supported Folkman and Lazarus' finding for age differences. That is, the average effect size for younger samples was larger than that for older samples (mean  $r$ 's =  $-.21$  vs.  $-.07$ ).

*Self Control.* The results for self-control suggested that this coping strategy was negatively associated with overall health outcomes. Examining type of health outcome, however, revealed that self-control was positively

<sup>13</sup>These damaging behaviors, however, are more similar to items reflected in the escape-avoidance scale (e.g., "Tried to make myself feel better by . . . drinking, smoking, using drugs, and so forth") than to items in the distancing scale.

associated with physical health outcomes but negatively associated with psychological health outcomes. The positive association between self-control and physical health is consistent with researchers' suggestion that self-control may improve situations or keep them from getting worse by facilitating problem-focused coping or seeking social support (e.g., Carver *et al.*, 1989; Folkman *et al.*, 1986a). In addition, the negative association between self-control and psychological health is consistent with researchers' suggestions that self-control leads to increased psychological symptomatology (e.g., Aldwin and Revenson, 1987). This may be because self-control is often associated with feelings of confusion and/or incompetence (e.g., Lazarus and Launier, 1978), which may lead to frustration and negative affectivity in stressful situations.

*Seeking Social Support.* The results for seeking social support reveal that this strategy was negatively associated with overall health outcomes. However, the moderational analyses indicated that seeking social support was actually significantly associated only with physical health outcomes, and not with psychological health outcomes. The negative association between seeking social support and physical health is inconsistent with researchers who have suggested that this strategy leads to improved physical health, perhaps through its association with factors such as increased immune functioning (e.g., Cohen, 1988; Schwarzer and Leppin, 1991) and decreased neuroendocrine responsivity (e.g., Goplerud, 1980; see Kampfe and Mitchell, 1991). Similarly, the nonsignificant association between seeking social support and psychological health is inconsistent with general suggestions that seeking social support leads to either increased (e.g., Cohen, 1988; Goplerud, 1980; Schwarzer and Leppin, 1991) or decreased (e.g., Aldwin and Revenson, 1987; Folkman and Lazarus, 1985) psychological well-being.

As described above, stressor characteristics moderated the overall association between seeking social support and health outcomes. Regarding type of stressor, although seeking social support was not correlated with health-related stressors, it was positively correlated with health outcomes in job-related stressors and negatively correlated with health outcomes in relationship-related and self-selected stressors. In terms of job-related stressors, it may be that social support provides sympathy or tangible help that improves the work-related problem or reduces the individual's feelings of isolation and loneliness. In terms of relationship-related stressors, many studies in our analyses examined caregiving for a spouse with Alzheimer's disease or with widowhood. In these cases, *seeking* social support may be distinct from *receiving* social support. Regrettably, the lack of information about the self-selected stressors precludes explaining their results.

Stressor controllability also moderated seeking social support's association with health outcomes. Specifically, the strategy was negatively correlated

with health outcomes for controllable stressors but not significantly correlated with health outcomes for uncontrollable stressors. In terms of controllable stressors, the negative correlation suggests that seeking social support does not fit these stressors' demands for action. In contrast, seeking social support (e.g., sympathy and understanding) may be less detrimental in uncontrollable stressors because participants could not change the situation, thereby enhancing the likelihood of receiving emotional support or comfort from others (e.g., Wortman and Dunkel-Schetter, 1987).

Finally, stressor duration moderated the overall association between seeking social support and health outcomes. Specifically, seeking social support was negatively correlated with health outcomes for acute stressors but positively correlated with health outcomes for chronic stressors. In terms of acute stressors, social support (whether it was informational or emotional) simply may not have been available. For chronic stressors, however, participants may have had more time to marshal effective social support, which in turn may be associated with more favorable health outcomes.

One possible explanation for our findings for social support is that the associations between seeking social support and health depend on the nature of the support. Researchers have suggested that seeking informational support may reduce uncertainty and distress by providing an increased understanding of the situation, which may facilitate problem-focused coping (e.g., Billings and Moos, 1984; Cohen, 1988; Houston, 1987; Lazarus and Folkman, 1984). Seeking emotional support, however, could be maladaptive if individuals are seeking support to vent their emotional distress (e.g., Billings and Moos, 1984; Houston, 1987; Lazarus and Folkman, 1984). It was impossible to explore how this distinction affected the current analyses, however, as the WOC-R seeking social support scale includes both instrumental and emotional support items, and studies did not distinguish the two forms of social support in their results.

*Accepting Responsibility.* The results for accepting responsibility suggested that this coping strategy was negatively associated with overall health outcomes. Like confrontive coping and distancing, however, accepting responsibility was associated primarily with psychological health outcomes in our analyses. The negative correlation is consistent with researchers who have suggested an association between accepting responsibility and increased psychological distress (e.g., Aldwin and Revenson, 1987; Bolger, 1990) and negative affectivity (e.g., Folkman and Lazarus, 1986; McCrae and Costa, 1986). The exceptions to accepting responsibility's negative results in our analyses were that the strategy was not significantly associated with health outcomes for job-related, controllable, or chronic stressors.

The moderating analyses suggested that the negative correlation between accepting responsibility and health outcomes was largely consistent

across a range of stressors. The inverse association may have been due to the proportion of items on the scale that have a connotation of blame, rather than an objective acknowledgment of responsibility. Blame implies fault or accountability and often results in negative emotions such as anger (Janoff-Bulman, 1979; Lazarus, 1991), as well as decreased self-esteem (Carver and Scheier, 1994; McCrae and Costa, 1986), which may reduce confidence in situational stressors (Folkman and Lazarus, 1988b). In contrast, acknowledging responsibility implies causation, without implying control or volition.

*Planful Problem Solving.* The results for planful problem solving suggested that this coping strategy was not significantly associated with overall health outcomes. Unlike other coping strategies, follow-up analyses rarely altered the initial findings. These findings are inconsistent with researchers' general suggestions that the planful problem solving should be associated with improved physical and psychological health (e.g., Aldwin and Revenson, 1987; Felton and Revenson, 1984; Folkman and Lazarus, 1988a; Folkman *et al.*, 1986b; Holahan and Moos, 1987; McCrae and Costa, 1986). The exception to our null findings is in the case of acute stressors, when planful problem solving demonstrated a positive correlation to health outcomes.

There are at least two possible explanations for our findings. First, there may have been insufficient statistical power to detect the small correlation between this strategy and health outcomes. Second, the adaptive or maladaptive nature of planful problem solving may depend on situational or personal characteristics that we were unable to measure in the current analyses. For example, Aldwin and Revenson (1987) have suggested that the individual's perceived effectiveness of planful problem solving moderates its association with psychological health. Like many self-report coping inventories, however, the WOC-R and the WCCL measure only what individuals did to cope with a stressful event, not whether they thought a strategy was effective. As such, we were unable to examine perceived effectiveness as a moderator in our analyses.

*Escape-Avoidance.* The results for escape-avoidance suggested that this coping strategy was negatively associated with overall health outcomes. Examining type of health outcome, however, revealed that escape-avoidance was negatively correlated and with psychological health outcomes, and not significantly correlated with physical health outcomes. The negative association between escape-avoidance and psychological health is consistent with researchers who have suggested that escape-avoidance leads to decreased psychological well-being (e.g., Aldwin and Revenson, 1987; Carver *et al.*, 1989; Felton and Revenson, 1984; Folkman and Lazarus, 1985). This may be because individuals are more likely to use escape-avoidance when self-confidence is low and fear is high (e.g., Holahan and Moos, 1987), possibly

leading to an avoidance of problem-focused coping, increased anxiety, and worsened situational outcomes (e.g., Folkman and Lazarus, 1988a). The moderational analyses revealed that escape-avoidance was consistently and negatively associated with health outcomes across a range of stressors. It may be that escape-avoidance alienates or offends other people, deteriorating relationships and worsening interpersonal stressors (e.g., Folkman and Lazarus, 1988b).

The nonsignificant association between escape-avoidance and physical health was inconsistent with researchers' suggestions that this strategy should be physically maladaptive because it is often associated with a decrease in health-promoting behaviors, such as regular exercise, seeking medical help, and adhering to a medical regimen. In addition, escape-avoidance should be maladaptive because it may be associated with an increase in individuals' health-damaging behaviors, such as taking drugs or alcohol, or an increase in other risk-taking behaviors, increasing one's susceptibility to disease (e.g., Lazarus, 1991; see also Cohen, 1984).

*Positive Reappraisal.* There was no overall association between positive reappraisal and health in these analyses. Examining type of health outcome, however, revealed that although positive reappraisal was not significantly correlated with physical health, it was negatively correlated with psychological health. The lack of a significant association between positive reappraisal and physical health in the present analyses is inconsistent with suggestions that positive reappraisal is physically adaptive because it produces positive physiological changes (see Cohen, 1984).

The negative correlation between positive reappraisal and psychological health in the current analyses is also inconsistent with researchers who have suggested that positive reappraisal should be associated with positive affectivity and improved psychological health (e.g., Carver and Scheier, 1994; Folkman and Lazarus, 1986; Gottlieb, 1997; Holahan and Moos, 1987). Although speculative, one explanation for our negative finding is that many of the items contributing to the positive reappraisal scale suggest a degree of acceptance and passivity, rather than energization resulting from a renewed and positive outlook. That is, many of the items may not reflect efforts to appraise situations positively as much as they reflect efforts at spirituality or personal growth (Carver *et al.*, 1989). Although these activities may provide a certain amount of relief, they may keep the individual from acknowledging the severity of a stressful situation and taking action, which may escalate the stressor and one's distress (e.g., Taylor and Brown, 1988). Alternatively, positive reappraisal may have been maladaptive because this strategy requires cognitive work, possibly including the individual's distortion of the situational reality, and this work may be difficult to sustain even temporarily (e.g., Folkman and Lazarus, 1988a, 1988b).

The moderational analyses revealed that situational characteristics affect the negative association between positive reappraisal and health outcomes. Regarding type of stressor, positive reappraisal was not significantly correlated with health outcomes in health-related stressors but was negatively correlated with health outcomes in relationship-related and self-selected stressors. In terms of relationship-related stressors, most of the effect sizes were associated with caregiving, and it may be difficult to keep up the illusion that something positive will come out of a situation in which the patient's health is not improving. Regarding self-selected stressors, the unknown stressor characteristics preclude most explanations for this negative association. Although speculative, it may be that the self-selected stressors were largely relationship-related. Lending support to this explanation is the fact that many of the coping strategies in our meta-analyses showed similar effects on health outcomes for relationship-related and self-selected stressors.

*Wishful Thinking.* The results for wishful thinking suggested that this coping strategy was negatively associated with overall health outcomes. Like many other strategies, however, wishful thinking was correlated primarily with psychological health outcomes in our analyses. The finding for psychological health is consistent with researchers who have suggested an inverse association between wishful thinking and psychological well-being (e.g., Billings and Moos, 1981; Coyne *et al.*, 1981; Felton and Revenson, 1984) and a positive association between wishful thinking and negative affect (e.g., Folkman & Lazarus, 1985).

The null finding for physical health has no support in the literature, suggesting either a dearth of research relating wishful thinking to physical health outcomes or a file drawer problem (i.e., unpublished research). As this category consisted of and one effect size, however, and this correlation was to a health-related stressor (i.e., managing diabetes), the association between wishful thinking and physical health outcomes needs further investigation.

Follow-up analyses revealed that the negative association between wishful thinking and health was consistent across a range of stressors. One explanation for this is that wishful thinking is often associated with anticipatory threat emotions [e.g., worry, anxiety (Folkman and Lazarus, 1985)] and its possible link to neuroticism (McCrae and Costa, 1986). That is, individuals may use this strategy when expecting unfavorable situational outcomes, and this expectation leads to poor situational outcomes and/or personal failure (i.e., self-fulfilling prophecy).

*Vitaliano's Problem-Focused Coping.* The results for Vitaliano's problem-focused coping suggested that this coping strategy was positively associated with overall health outcomes. Examining type of health outcome, however, revealed that this strategy was correlated primarily with

psychological health outcomes in our analyses. The associations with psychological health are consistent with researchers' suggestions that this strategy is positively associated with greater psychological well-being [e.g., less depression (Vitaliano *et al.*, 1985)] but inconsistent with the current findings for Folkman's planful problem solving, which demonstrated no significant association to psychological health (a point to which we return).

In general, follow-up analyses revealed that, like Folkman's planful problem solving, Vitaliano's problem-focused coping was not significantly associated with health-related outcomes. Exceptions to these results involved health-related stressors and chronic stressors, which revealed positive associations between Vitaliano's problem-focused coping and health outcomes. In terms of health-related stressors, planful problem solving may facilitate taking an active role in one's health (e.g., adhering to medical regimens, scheduling regular medical appointments), resulting in improved health outcomes. This explanation may also apply to the chronic stressors, as the effects in this category were all associated with health-related stressors in our analyses.

*Vitaliano's Avoidance.* The results for Vitaliano's avoidance suggested that this coping strategy was negatively associated with overall health outcomes. Examining type of health outcome, however, revealed that Vitaliano's avoidance was correlated primarily with psychological health outcomes in our analyses. The correlation with psychological health is consistent with suggestions that Vitaliano's avoidance scale should be associated with decreased psychological well-being (e.g., Kampfe and Mitchell, 1991) and is consistent with the current finding for Folkman's escape-avoidance scale.

The nonsignificant correlation with physical health has no support in the literature, again suggesting either a lack of research into this association or a file drawer problem. Similar to escape-avoidance, moderating analyses demonstrated that Vitaliano's avoidance strategy was negatively associated with health outcomes across a range of stressors. Recall that Vitaliano's avoidance strategy combines aspects of Folkman's distancing, self-control, and escape-avoidance strategies. That this strategy was inversely correlated with psychological health across a range of stressors in our analyses should not be surprising, then, as researchers have suggested a negative association between psychological health and each of the Folkman strategies that contribute to Vitaliano's avoidance strategy (e.g., Billings and Moos, 1981; Felton and Revenson, 1984; Folkman and Lazarus, 1988b). The exception to the negative associations was that Vitaliano's avoidance was not significantly correlated with health outcomes in controllable stressors, which may be due to the low statistical power and/or situational or sample characteristics associated with the one effect size in this category.

### Summary

Table XV summarizes our results for the overall associations between coping and health outcomes and shows that most of the coping strategies we examined were in fact correlated with overall health outcomes. Specifically, Vitaliano's problem-focused coping was significantly correlated with positive overall health outcomes, whereas confrontive coping, distancing, self-control, seeking social support, accepting responsibility, wishful thinking, and the two avoidance scales were each negatively correlated with overall health outcomes in our analyses. Planful problem solving and positive reappraisal were not reliably associated with overall health in our analyses.

Table XV also presents the moderators of the coping–health outcomes associations. In contrast to the overall associations, the moderational analyses suggested that the adaptiveness or maladaptiveness of a particular coping strategy typically depends on the type of health outcome, as well as stressor characteristics. In addition, the moderating analyses frequently revealed significant correlations that were absent in the individual samples. Therefore, by combining qualitatively similar studies with relatively small sample sizes into one analysis with a larger sample size, the moderational analyses had increased power to detect small effect sizes. This was particularly noticeable with distancing, in which only 2 of the 21 individual samples were significant. Combining the results from the individual studies, however, revealed several significant associations, including a negative correlation between distancing and both overall health and psychological health.

To summarize, our analyses provided a quantitative synthesis of the association between coping and health outcomes across a variety of samples, stressors, and outcomes. Although many of the findings were consistent with previous theories, there were some inconsistencies. For example, although researchers have suggested a positive association between problem-focused coping strategies and health outcomes, our analyses showed that there was frequently no correlation between the two variables.

### GENERAL DISCUSSION

The goal of the current meta-analyses was to determine whether coping is reliably associated with health outcomes. Our results suggest that the answer is a qualified yes. That is, most of the coping strategies demonstrated significant correlations with health outcomes, but the stability, direction, and strength of the associations varied across the coping strategies. Some strategies demonstrated consistent associations across a range of stressors, whereas other strategies appeared to have a more situation-specific relationship to

**Table XV.** Summary of Coping Strategies' Associations with Health Outcomes

Strategy	Overall r	Type of health outcome			Type of stressor			Controllability of stressor			Duration of stressor		
		Physical	Psychological	Health	Job	Relationship	Self-selected	Controllable	Uncontrollable	Acute	Chronic	Acute	Chronic
CC	<b>-.15</b>	-.06	<b>-.22</b>	<b>-.10</b>	N/R	<b>-.26</b>	<b>-.15</b>	<b>-.19</b>	<b>-.16</b>	<b>-.26</b>	<b>-.07</b>	<b>-.06</b>	<b>-.07</b>
D	<b>-.06</b>	-.02	<b>-.08</b>	-.06	<b>-.15</b>	.05	-.06	<b>-.20</b>	-.02	-.06	<b>-.07</b>	-.09	<b>.06</b>
S-C	<b>-.10</b>	<b>.11</b>	<b>-.23</b>	-.04	N/R	<b>-.14</b>	<b>-.14</b>	<b>-.16</b>	-.09	-.09	-.09	-.09	<b>.06</b>
SSS	<b>-.04</b>	<b>-.08</b>	-.03	-.02	<b>.21</b>	<b>-.14</b>	<b>-.10</b>	<b>-.14</b>	-.02	<b>-.10</b>	<b>.09</b>	-.02	<b>.09</b>
AR	<b>-.16</b>	.08	<b>-.22</b>	<b>-.13</b>	.09	<b>-.17</b>	<b>-.21</b>	<b>-.21</b>	-.06	<b>-.21</b>	<b>-.05</b>	<b>-.21</b>	<b>-.05</b>
PPS	<b>.02</b>	.03	.02	-.02	.05	-.03	.07	-.03	.00	<b>.11</b>	<b>-.03</b>	.00	<b>.11</b>
E-A	<b>-.31</b>	.02	<b>-.47</b>	-.08	N/R	<b>-.39</b>	<b>-.47</b>	<b>-.23</b>	<b>-.23</b>	<b>-.38</b>	<b>-.05</b>	<b>-.38</b>	<b>-.05</b>
PR	-.05	.02	<b>-.10</b>	.03	N/R	<b>-.11</b>	<b>-.10</b>	<b>-.10</b>	-.01	<b>-.13</b>	<b>.01</b>	<b>-.01</b>	<b>.01</b>
WT	<b>-.42</b>	.00	<b>-.42</b>	<b>-.45</b>	<b>-.36</b>	N/R	<b>-.33</b>	<b>.00</b>	<b>-.49</b>	<b>-.48</b>	<b>-.42</b>	<b>-.48</b>	<b>-.42</b>
VPFC	<b>.08</b>	-.06	<b>.10</b>	<b>.10</b>	N/R	N/R	<b>.06</b>	<b>.00</b>	<b>-.08</b>	<b>.11</b>	<b>.31</b>	<b>.11</b>	<b>.31</b>
VA	<b>-.34</b>	.00	<b>-.36</b>	<b>-.30</b>	N/R	N/R	<b>-.38</b>	<b>.00</b>	<b>-.33</b>	<b>-.41</b>	<b>-.16</b>	<b>-.41</b>	<b>-.16</b>

Note. Numbers in bold face represent significant Pearson's product-moment correlations ( $p \leq .05$ ). N/R, not represented in this strategy. CC, confrontive coping; D, Distancing; S-C, self-control; SSS, seeking social support; AR, accepting responsibility; PPS, planful problem solving; E-A, escape-avoidance; PR, positive reappraisal; WT, wishful thinking; VPFC, Vitaliano's problem-focused coping; VA, Vitaliano's avoidance.

health outcomes. Still others demonstrated positive correlations with some outcomes and negative correlations with others. In the following sections we discuss a range of issues, including the similarities and differences between Folkman's and Vitaliano's coping scales and whether the researcher-and self-selected stressor coping paradigms produced analogous results.

### **Similarities and Differences in Folkman's and Vitaliano's Scales**

Folkman's and Vitaliano's scales showed similarities as well as differences. Recall that three of the five Vitaliano scales (i.e., seeking social support, wishful thinking, and self-blame) were virtually identical to the corresponding Folkman scales and were combined in the current analyses. Vitaliano's problem-focused coping and avoidance scales, however, were less similar to the corresponding Folkman scales; as a result, the strategies were analyzed separately, a decision that appeared to be appropriate for the problem-focused scales but perhaps inappropriate for the avoidance scales.

Regarding the problem-focused scales, there were several similarities as well as some differences. For example, neither strategy was significantly associated with physical health or with health outcomes in self-selected stressors. However, whereas acute stressors were the only ones in which Folkman's planful problem solving was reliably associated with health outcomes in our analyses, Vitaliano's problem-focused coping frequently demonstrated a positive association with health. For example, Vitaliano's scale was positively correlated with both overall health and psychological health and was associated with favorable health outcomes for health-related stressors and both acute and chronic stressors.

As suggested above, the two avoidance scales produced largely similar results in the current analyses. Specifically, both Vitaliano's avoidance scale and Folkman's escape-avoidance scale demonstrated a significant negative correlation with overall health and with psychological health but was not significantly associated with physical health outcomes. In addition, both strategies demonstrated a significant negative correlation with health outcomes in self-selected stressors, uncontrollable stressors, and acute stressors. There were, however, a few differences between the scales. Folkman's scale was not significantly associated with health outcomes for health-related stressors or for chronic stressors, whereas the only exception to the negative association between Vitaliano's avoidance and health was for controllable stressors. This category was based on a single study, however, making interpretation of the anomaly difficult.

### **Researcher-Selected vs. Self-Selected Stressor Paradigms**

Earlier, we raised the question of whether the researcher-selected and the self-selected coping paradigms produce analogous results. The current analyses suggest that the two paradigms produce largely similar results. Specifically, the patterns for self-selected stressors, although not always significant, were generally consistent with the rest of the findings for each coping strategy. Therefore, although some researchers have criticized studies using self-selected stressors for their lack of control and increased situational variability (e.g., Carver and Scheier, 1994), the results from the two paradigms were comparable. The drawbacks to the self-selected paradigm, however, are that the variability in these stressors makes it difficult to interpret the findings for coping across participants within the study, limiting the generalizability of the results. In addition, one cannot examine potentially important moderators of coping with self-selected stressors.

### **Limitations**

Limitations to the current analyses fall into two general categories: studying coping through self-report questionnaires and studying coping in the current meta-analyses. The potential limitations of using self-report questionnaires to examine coping include the questionnaires themselves, researchers' use of the questionnaires, and individuals' reactions to the questionnaires (e.g., Coyne and Gottlieb, 1996; Folkman, 1992; Stone and Kennedy-Moore, 1992; Vitalicano *et al.*, 1987). Regarding the questionnaires themselves, it is possible that the limited number of coping items miss important strategies (e.g., Aldwin and Revenson, 1987). At least in terms of the WOC-R and the WCCL, the limited number of coping items may also affect the scales that emerge from factor analyses, which researchers have consistently found to be unstable (e.g., Aldwin and Revenson, 1987; Folkman and Lazarus, 1986a; Vitalicano *et al.*, 1987).

One reason for the scale inconsistencies may be that the items cannot reveal why an individual endorses a specific coping item. For example, an individual may endorse the item "I tried not to act too hastily or follow my first hunch" because it helped him or her to plan a course of action (i.e., problem-focused coping) or because it helped control his or her affective distress (i.e., self-control). Indeed, this item loaded onto the problem-focused coping scales in the Folkman and Lazarus (1985) and Vitalicano *et al.* (1985) analyses but onto the self-control coping scale in the Folkman *et al.* (1986a) analysis.

Another reason for the scale inconsistencies may be the lack of redundancy among scale items. That is, unlike other self-report measures (e.g.,

personality inventories), the activities within WOC-R or WCCL subscales do not necessarily cooccur (e.g., Folkman, 1992; Stone and Kennedy-Moore, 1992). For example, individuals who endorse "Just concentrated on what I had to do next—the next step" may or may not endorse "Came up with a couple of different solutions to the problem," even though both items are part of Folkman and co-workers' (1986a) planful problem solving scale. This lack of redundancy contributes to the relatively low scale alphas, which range from .61 (distancing) to .79 (positive reappraisal) in Folkman's scale and from .74 (avoidance) to .88 (problem-focused coping) in Vitaliano's scale.

In addition, researchers have consistently found that the WOC-R and WCCL scales are intercorrelated (e.g., Aldwin and Revenson, 1987; Folkman and Lazarus, 1985; Folkman *et al.*, 1986a; Vitaliano *et al.*, 1987). This is consistent with Lazarus's (1991; Lazarus and Folkman, 1984) contention that within any given stressful episode, people use multiple coping strategies [e.g., self-control with seeking social support and problem-focused coping; Folkman *et al.*, 1986a]. However, the intercorrelations among the scales make it difficult to examine coping strategies' independent associations to health outcomes.

In terms of how researchers use the WOC-R or WCCL, most rely on cross-sectional designs, measuring coping retrospectively. This method is problematic because it subjects the results to participants' memory biases. That is, the retrospective method of assessing coping may be affected by participants' distortions of actual coping efforts [e.g., presenting favorable images to the researcher (see Coyne and Gottlieb, 1996)] or by their simply forgetting actual coping efforts. Also, cross-sectional methodology requires participants to recall and report consciously processes that may be unconscious or habitual (Stone *et al.*, 1991). Finally, it cannot reveal changes in coping over time, which is critical in understanding coping as an evolving process (e.g., Lazarus and Folkman, 1984). A notable exception to the cross-sectional methodology is Folkman and Lazarus's (1985) study, which revealed that students' reported coping changed over three stages of a college exam.

The cross-sectional and retrospective method is also problematic because participants may differ in their definitions of the coping period or in the temporal boundaries of the stressful event (e.g., Stone and Kennedy-Moore, 1992). For example, Stone *et al.* (1991) had participants report how they coped with a self-selected stressor. After participants had completed the WOC-R, the authors interviewed them to assess to which stage(s) of the stressor they had referred when completing the questionnaire. Although most participants stated that their stressor had a preparatory or anticipatory stage, an acute stage when the stressor was its most intense, and a recovery or poststressor stage, most reported their coping only in reference to the acute stage. As individuals' use of coping strategies may differ across coping stages,

the difference in participants' definitions of the coping period is important and may produce biased results.

Finally, there may be differences in how individuals react to coping questionnaires, due in part to demand characteristics or self-preservation motives inherent in many self-report questionnaires (see Coyne and Gottlieb, 1996). For example, the response format of 0 to 3 may encourage participants to report more coping than they actually used (i.e., endorse more items or endorse specific items higher). This can happen because the format may imply that "more coping is better coping" (e.g., Aldwin and Revenson, 1987) or because individuals want to appear as if they did everything they could to manage the stressful event (e.g., Coyne and Gottlieb, 1996). In addition, individuals may differ in their interpretation of the response format. For example, Stone *et al.* (1991) found that participants differentially interpreted the scale as referring to frequency, duration, effort, or usefulness of a coping strategy and that individuals often changed their interpretations of the response format based on their interpretations of individual items.

In addition to limitations of studying coping with current coping questionnaires, there are potential limitations to examining coping with the current meta-analyses. First, by examining effects of coping on the broad categories of physical and psychological health outcomes, our analyses reveal little about how coping may differentially relate to specific outcomes within the broad categories. For example, our results suggest that self-control is associated with positive physical health outcomes in general but do not reveal whether or how it is associated with specific health outcomes (e.g., length of hospitalization). The current dearth of available research, however, hinders examining correlations between coping and specific health outcomes.

Second, like most meta-analyses, selection processes limit our conclusions. By including only published data from nonclinical adult samples, any conclusions are similarly limited to these groups. A related concern for meta-analyses is that of the bias to publish significant results, which may lead to an underrepresentation of nonsignificant effects in research syntheses (Cooper, 1998; Glass *et al.*, 1981); however, our results do not support this concern. In fact, our results may have been biased in the opposite direction. This may be because the association between coping and health outcomes was often *not* the main focus of the individual studies. On average, only 36% of the overall effects in these meta-analyses were significant, ranging from 10% for distancing to 77% for wishful thinking. Furthermore, in most of the coping strategies we included, less than 40% of the individual samples' correlations were significant. The three exceptions were escape-avoidance (56%), wishful thinking (77%), and Vitaliano's avoidance (67%).

Third, the procedure of subjectively coding for the potential moderators may have misidentified the true nature of these associations in the general

population. This is particularly likely for both stressor controllability and stressor duration, which we coded subjectively based on the information provided in each study. That two of the present authors independently coded the studies, achieving an acceptable overall agreement, somewhat addresses the concern of random placement of the studies into the moderational categories.

Next, our analyses could not address the issue of causality. That is, it was impossible to determine whether coping was the antecedent or the consequence of health or whether the association was bidirectional (e.g., Aldwin and Revenson, 1987; Folkman and Lazarus, 1988a; Folkman *et al.*, 1986a). For example, as many of the studies we included were cross-sectional, it is possible that individuals' existing physical or psychological state affected their choice of coping strategies (e.g., Felton and Revenson, 1984), which in turn may have affected their subsequent physical or psychological state. To understand the direction of the association between coping and health, researchers must conduct and publish longitudinal studies examining the effects of coping on health outcomes.

Another issue is statistical power. For example, several of the coping strategies demonstrated a consistent pattern of associations across a range of stressors, but not all associations were significant. This suggests that at least some of the nonsignificant associations between coping and health outcomes in the current analyses may have been due to insufficient statistical power to detect small effect sizes, demonstrating the need for additional research into the association between coping and health outcomes. Finally, some of the moderators were confounded in the current meta-analyses. For example, type of stressor was confounded with controllability and duration. Specifically, health-related stressors were usually controllable and chronic in the Folkman coping strategies, and in the Vitaliano coping strategies, health-related stressors were usually uncontrollable and chronic. In addition, self-selected stressors were all categorized as undeterminable controllability and duration (although we excluded these undeterminable categories from our analyses).

## CONCLUSIONS

Quantitative syntheses such as the current meta-analyses are useful for several reasons. First, there is a large body of literature using the WOC-R or the WCCL with a variety of samples and methodologies. At the very least, the current synthesis summarizes previous findings into coherent units and presents preliminary evidence of how specific coping strategies may relate to physical and psychological health outcomes. Second, our analyses reveal that

coping strategies are differentially associated with health outcomes. For example, confrontive coping and wishful thinking were consistently associated with negative health outcomes. In contrast, we found that the positive associations between seeking social support and health depended on situational characteristics. Finally, our meta-analyses demonstrate the need for additional research into the associations between coping and health outcomes, particularly for physical health outcomes.

## APPENDIX

### Sample Items from Coping Scales Included in These Analyses

#### *Confrontive Coping*<sup>12</sup>

- “Stood my ground and fought for what I wanted”
- “I expressed anger to the person(s) who caused the problem”
- “Tried to get the person responsible to change his or her mind”

#### *Distancing*<sup>13</sup>

- “Tried to forget the whole thing”
- “Went on as if nothing had happened”
- “Went along with fate; sometimes I just have bad luck”

#### *Self-Control*<sup>1</sup>

- “I tried to keep my feelings to myself”
- “I tried not to act too hastily or follow my first hunch”
- “I tried to keep my feelings from interfering with other things too much”

#### *Seeking Social Support*<sup>3</sup>

- “Talked to someone to find out more about the situation”
- “Accepted sympathy and understanding from someone”
- “I asked a relative or friend I respected for advice”

#### *Accepting Responsibility*<sup>3</sup>

- “Criticized or lectured myself”
- “Realized I brought the problem on myself”
- “I made a promise to myself that things would be different next time”

#### *Planful Problem Solving*<sup>2</sup>

- “I knew what had to be done, so I doubled my efforts to make things work”
- “I made a plan of action and followed it”
- “Just concentrated on what I had to do next—the next step”

#### *Escape-Avoidance*<sup>1</sup>

- “Tried to make myself feel better by eating, drinking, smoking, using drugs or medications, etc.”

“Avoided being with people in general”

“Slept more than usual”

*Positive Reappraisal<sup>2</sup>*

“Changed or grew as a person in a good way”

“I came out of the experience better than when I went in”

“Found new faith”

*Wishful Thinking<sup>4</sup>*

“Wished the situation would go away or somehow be over with”

“Wished that I could change what had happened or how I felt”

“Had fantasies or wishes about how things might turn out”

*Vitaliano's Problem-Focused Coping<sup>5</sup>*

“Bargained or compromised to get something from the situation”

“Looked for the silver lining, so to speak; tried to look on the bright side of things”

“Changed something so things would turn out all right”

*Vitaliano's Avoidance<sup>5</sup>*

“Kept others from knowing how bad things were”

“I tried to keep my feelings to myself”

“Refused to believe it had happened”

*Notes*

<sup>1</sup>From Folkman and co-worker's (1986a) factor analysis.

<sup>2</sup>Combination of Folkman and Lazarus' (1985) and Folkman and co-workers' (1986a) factor analyses.

<sup>3</sup>Combination of all three factor analyses.

<sup>4</sup>Combination of Folkman and Lazarus' (1985) and Vitaliano and co-workers' (1985) factor analyses

<sup>5</sup>From Vitaliano's (1985) factor analysis.

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