IS LIFE MORE DIFFICULT ON MARS OR VENUS? A META-ANALYTIC REVIEW OF SEX DIFFERENCES IN MAJOR AND MINOR LIFE EVENTS[1]

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ABSTRACT

We conducted a meta-analysis of studies examining sex differences in reported levels of stress, considering the impact of: (a) the age and representativeness of sample participants, (b) whether life events were weighted or unweighted by participants for impact or severity, (c) the major versus minor nature of the stress, and (d) the life domain of the stressor. Overall, the meta-analysis of 119 studies including 83,559 participants found that females were exposed to more stress than were males (d = .123, r = .061). However, there was considerable heterogeneity among studies, with greater effect sizes associated with: (a) life events weighted by participants for impact, (b) adolescents compared to both younger and older samples, (c) major life stressors compared to minor stressors, and (d) interpersonal relationship stressors compared to work stressors. In none of the subgroup analyses did males experience considerably more stress than females. Evaluation of a subsample of 39 studies that examined gender differences in psychological symptoms revealed that females reported more symptoms of depression, anxiety, and psychosomatic problems (d = .282, r = .139) and that the sex difference in reports of psychological symptoms accounted for approximately 4% of the variance in the sex differences in reports of stress. Possible explanations for the observed patterning of effects are discussed, as are recommendations for further research.

(**Ann Behav Med** 1999, *21*(1):83–97)

INTRODUCTION

Considerable attention has been directed over the past two decades to understanding the experience of stress in the lives of males and females. Perhaps inevitably, comparisons between the sexes have been made to determine who bears the most substantial burden in today's complex world as a means of clarifying the potential role of these burdens in explaining health outcomes. The available literature has led some to the conclusion that males are under greater stress, relative to females, at least partly because gender role stereotypes for males in western culture include strong emphasis on achievement, competency, and competition (1,2). Thus, males may experience ongoing stress because they are constantly striving to perform well and to advance in an increasingly competitive world and may experience greater cost than females when there is some indication that they have failed to compete successfully (3). For example, employed men report that they work more hours and encounter more concrete deadlines than do employed women, and the positive association between reported stress and work hours and number of deadlines is stronger for males than for females (4).

Equally persuasive are those who propose that females are under greater stress relative to men. Proponents of this perspective suggest that stress in the lives of women is more intense and persistent than it is in the lives of men (5,6). They cite literature indicating that females have less access to power and control than do males. For example, some data indicate that women are more likely than men to be employed in low-prestige, low-paying positions that allow little opportunity for advancement or decision latitude and that demand a high work pace (7). Further, because gender role stereotypes for females emphasize concern for the well-being of others, women typically feel obliged to be available to meet the needs of the family, an obligation that endures past the end of the workday. Even when women are employed outside the home, they continue to have more responsibility for home and children, resulting in a higher total workload and less time to attend to their own needs compared to men (8,9).

A third perspective argues that males and females experience stress at similar levels but in different life domains by virtue of differing social roles (10,11). According to this view, males are likely to experience greater stress in areas relevant to work and career, and females are likely to experience greater stress in areas relevant to interpersonal relationships. In fact, starting in childhood, males do report that they are more affected by striving to develop autonomy and financial security, whereas females indicate that they are more affected by the difficulties experienced by others in their social networks, and by problems in family or peer relationships (12–16).

Which of these perspectives adequately describes the available data? Are there gender differences in either degree or domain of stress experience across the literature? Perhaps the most compelling rationale for considering these unresolved issues is that stress is a key variable in prevailing models of health and illness, and any sex differences in the experience of stress may help to explicate sex differences in various health outcomes. In a general model linking stress with health-related outcomes, Lazarus and Folkman (17) suggested that when individuals confront an external event, they engage in a process of determining both the meaning of

[1] Preparation of this manuscript was supported in part by NHLBI Grants HL25767 and HL38712 awarded to the second author.

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the event (termed primary appraisal) and the adequacy of their own resources to meet the demands of the event (termed secondary appraisal). The subjective experience of stress thus represents a combination of primary and secondary appraisal and is distinct from the occurrence of an external event. Once individuals determine that an event or circumstance is indeed stressful, they mount a response that includes physiological, cognitive, emotional, and behavioral components, which may have an impact on health.

Although sex may come into play at any of the stages in this model, we have elected to focus on sex differences in the initial exposure to external events and the subjective experience of stress for two reasons. First, a significant body of literature has examined reports of stress exposure and appraisal in males and females, allowing for a thorough evaluation of sex differences at these stages of the model. Second, the extent of an individual's exposure to events, both in general and in particular life domains, together with the evaluation of the stressfulness of events are likely to determine coping responses and subsequent health effects in males and females.

To examine variations in the exposure to and experience of stress between males and females, we conducted a meta-analytic review of the available literature. For the purposes of the review, we defined "stress exposure" as an individual's report of the occurrence of environmental events and "stress appraisal" as an individual's report of the occurrence of events weighted for the personal impact of those events. Clearly, this approach does not allow exhaustive coverage of all stress-related investigations, but adopting this definition does allow us to focus on a body of research that springs from a common conceptualization of stress and employs a similar methodology. In addition, the dominant measurement strategy in stress research has used self-report of major and minor life events from standardized lists.

In an attempt to provide a more comprehensive evaluation of the extent of sex differences in stress exposure and appraisal, this review encompasses investigations that assessed the occurrence and appraisal of a variety of environmental events through the use of self-report inventories. These inventories, which typically measure the experience of major life events and minor daily hassles, are widely used in studies exploring models of stress and illness, and many have documented validity and reliability. Some event and hassle inventories assess the occurrence of stress in particular life domains, most commonly in interpersonal relationships and the workplace. Further, they have been employed with many different age groups, providing the opportunity to explore the patterning of sex differences in stress experience at different developmental stages. Finally, they have been employed in studies in which the participants were more versus less representative of the population at large.

The current review of the available literature targets several fundamental questions regarding the stress experiences of males and females: (a) What is the magnitude of the difference between males and females in overall exposure to stress and in subjective appraisal of stress, considered separately?; (b) Do sex differences in stress exposure and appraisal vary by sample age or representativeness?; and (c) Do effect sizes in stress appraisal vary by the magnitude (i.e. major versus daily) or domain (i.e. relationship versus job) of the stressors? Because any sex differences in measures of stress might not reflect differences in exposure to stress but rather differences in the propensity to report negative affect, we also evaluated to what extent sex differences in stress exposure and appraisal can be accounted for by sex differences in depression, anxiety, and psychosomatic complaints.

METHOD

Literature Search

For the present review, we conducted a meta-analysis focusing on the literature relating gender and self-reported stress. Literature included in the meta-analysis initially was identified through the use of widely available computer databases (e.g. Psychological Abstracts, Index Medicus, Educational Resources Information Center [ERIC]) using the following keyword combinations: (sex, gender) and (stress, stressors, life events, hassles) followed by the ascendancy and descendancy approach to locating possible additional articles. All articles from 1960 to December, 1996 were examined. Additionally, the reference lists of articles acquired through the above procedure were explored for other relevant articles.

Inclusion Criteria

The primary criteria for study selection were that stressors were measured and described sufficiently in the Method section to determine that the measure included negative events, that the same stress measure was administered to males and females, and that statistical tests of sex differences were reported sufficiently to estimate effect sizes. We included studies that reported assessing discrete events (i.e. life events) or chronically stressful circumstances (i.e. daily hassles, job environment). Because we were interested particularly in stress exposure and appraisal, we did not examine studies that focused on stress responses. Thus, we excluded the literature examining role strain (perception that one is inadequately fulfilling important life roles) or role conflict (perception that one is torn between the demands of two or more life roles), because these measures are likely to confound exposure with response to role demands. We also excluded studies that focused solely on individuals' coping responses to stress or general affective state, or that examined only physiological or behavioral responses to stress (e.g. infant crying or cardiovascular functioning).

In investigations examining stress exposure and appraisal, individuals were provided with a list of major and/or minor events and asked to report which events had occurred during a time frame ranging from a week in the past to lifetime experience. Some of these studies also required participants to rate the severity or impact of the events that had occurred on a Likert-type scale. Event measures were scored for frequency of stress by summing across all items that had occurred and for impact by summing across the ratings of impact for events that had occurred. Event instruments typically comprised a wide variety of negative events relevant to the age and developmental stage of the sample being assessed. Established measures of major and minor events were used in approximately half of the investigations surveyed, with the remaining studies using ad hoc measures. Although the vast majority of items included in event inventories were pertinent to both males and females, a few instruments included sex-specific stressors that most often related to female reproductive function (e.g. pregnancy, missed period). These instances clearly occurred in only 5 of the 94 studies examining stress exposure and appraisal.

Among the studies that examined sex differences in discrete major and minor events, we excluded studies that: (a) focused on highly unusual or infrequent stressors that were unlikely to be relevant to the wider population (e.g. stress related to playing collegiate basketball or handling corpses; $n = 13$); (b) used medical or mental health patients because the experience of serious

health problems may affect individuals' recall and reporting of stress ($n = 6$); (c) were published in non-English journals or on non-western samples because access to and validity and reliability data for stress measures in non-western population are lacking ($n = 5$); (d) applied differential weights for events based on gender ($n = 1$); (e) reported item-by-item analyses of scales but failed to report an overall test for stress score ($n = 15$); and (f) that had individuals other than the participants themselves (e.g. parents) provide stress measures ($n = 2$).

Coding Effect Size and Moderator Variables

In addition to examining overall differences in stress between males and females, another goal of this meta-analysis was to explain the variability in effect sizes across studies. To this end, factors that might moderate or alter the magnitude of the relationship (i.e. effect size) between gender and stress indices were examined (18). Overall stress exposure was coded when investigations reported either the number of experienced life events or the impact of life events as determined by consensus ratings from reference samples (not the respondents themselves). Stress appraisal was coded for two general types of investigations: (a) studies reporting the respondents' subjective weighting of the severity, intensity, or negativity of experienced life events, and (b) studies of ongoing minor stress or daily hassles, because experience of everyday problems reflect both exposure to and perceived severity of minor stressors. Additionally, studies within the stress appraisal area were coded as assessing either minor events (i.e. daily hassles) or major life events.

Age grouping of the sample was determined by attempting to code studies roughly according to the following developmental stages: childhood/adolescence, young adulthood, and mature adulthood. Seven of the 14 studies examining stress exposure and perception in children included early adolescents in the sample and did not distinguish between age groups in reported analyses. Additionally, studies of mature adults often included young adults aged 18 to 30 in the sample. For the present analyses, studies were categorized as focusing on children when they included either children or children and early adolescents; on adolescents when they included only adolescents; on young adults when they included traditional undergraduate or graduate students or adults under the age of 30; and on mature adults when they included a broad range of adults. To achieve adequate power, studies of children and adolescents were collapsed together for analyses that examined effects sizes based on sample representativeness and type of stress in different age groups.

Most of the studies included in the current review did not randomly select participants but instead used samples of convenience. Many investigations examined samples of diverse individuals selected from the community at large, but others recruited highly unusual subgroups. For the purposes of the present review, representativeness of the sample was determined by examining the extent to which a study did or did not draw on special populations (e.g. gifted students, centagenarians) or unusual subsamples (e.g. participants in stress-reduction workshops). Representativeness was coded as present or absent.

Additionally, separate effect sizes were compared for studies that examined stress related to two specific areas: employment and interpersonal relationships. Measures of relationship stress were usually items aggregated by authors from among items included in major and minor life event inventories. Measures of employment stress incorporated formalized aspects of the job environment, such as work load, job demands, and decision latitude, as well as subjective reports of stress at work. Therefore, exposure to work stress was coded for studies that examined specific aspects of the job or work environment itself (e.g. noise, job control, and demands) and appraisal of work stress was coded for studies that examined self-reported impact of work circumstances. Finally, studies that compared men and women who occupied roughly equivalent job positions were coded as matched, while those that compared men and women who occupied different job positions were coded as nonmatched for job level.

To examine whether sex differences in stress exposure or appraisal could be accounted for by sex differences in reports of negative affect and psychosomatic complaints, we evaluated a subsample of studies that reported testing for sex differences in both stress and psychological symptoms. These investigations employed at least one validated measure of depressive symptoms, anxiety symptoms, or miscellaneous symptoms (e.g. behavior problems, distress, psychosomatic complaints).

A primary coder (the first author) and a secondary coder (the third author) independently coded all effect sizes, stress exposure and perception, and age for all studies included in the meta-analysis. Additionally, the primary coder coded all other moderator variables (i.e. major versus daily events, work stress variables, interpersonal stress, and psychological symptoms) for all studies. A third coder then independently coded each of these moderator variables for a random selection of approximately one-third of the studies included in the review. Any discrepancies were resolved by reaching consensus after discussion of relevant issues related to coding decisions. Prior to consensus, intercoder agreement for effect size calculations was kappa = .70 and for moderator variables ranged from kappa = .79 for coding sample representativeness to kappa = .94 for coding sample age.

Conversion of Outcome Measures to Effect Sizes

All effect sizes, reflecting sex differences in measures of stress and of psychological symptoms, were calculated using the statistical package D-stat (19). Analyses were conducted on Cohen's d effect size estimates, corrected for small sample bias (20). The corresponding correlation coefficient (r) for each d was also computed.

Whenever possible, effect sizes were calculated from means and standard deviations, as these provide the least biased effect size estimates (21). If no standard deviation or variance estimate was provided, t-tests or F-tests were used to calculate d. If a main effect t-test or F-test for gender was not available, the standard deviation for each group was obtained from a related F-test (i.e. an interaction that included a gender effect) and the effect size estimate was calculated from the mean and this standard deviation estimate. If the proportion or frequency of males and females who met some criterion (e.g. greater than one life event) was reported, the proportion was transformed to d by treating each proportion as the mean of a distribution of 0's and 1's, with the variance for each group of $p(1 - p)$, where p was a group proportion (19). Finally, if no information other than a p-value was provided, the effect size was calculated directly from the p-value. If the effect was merely described as nonsignificant, the effect size was coded as zero (22). Any study that did not include samples sizes or an estimate of the population standard deviation was not included in the analysis, as information was insufficient to compute an effect size. Effect sizes were coded such that positive effect sizes indicated greater stress or psychological symptoms reported among females, and negative effects sizes indicated greater stress or psychological symptoms among males.

In the results reported here, all mean effect sizes were based on the convention that individual studies could contribute only one mean effect size per stress measure (e.g. hassles, events). Further, multiple effect sizes for authors' multiple outcome measures (e.g. a hassles measure that included both frequency and impact scores) were averaged within studies. For studies that included repeated measures of stress over time, the data from the first assessment were always used to generate effect size estimates. These conventions prevented any particular research report from unduly weighting a mean effect size. For the analyses examining moderator variables, 16 studies contributed effect sizes for both stress exposure and appraisal, 2 studies contributed effect sizes for both daily and major events, 1 study contributed effect sizes for both work and interpersonal stress, and 1 study contributed effect sizes for both objective and appraisal measures of work stress.

To evaluate sex differences in stress measures and in psychological symptom measures, weighted-least-squares (WLS) analyses were conducted following procedures outlined by Hedges and Olkin (20). Homogeneity of effect sizes was examined to determine if the *d*'s varied more than would be expected by chance if the studies shared a common population effect size (20). If effect sizes are heterogeneous, then the mean weighted effect size does not adequately describe the study outcomes in the literature and moderator variables should be examined. In the case of heterogeneous effect sizes, models testing the relation between moderator variables and the magnitude of the effect sizes were conducted. All moderator variables in the current study were noncontinuous and were tested by dividing effect sizes into groups on the basis of study qualities and comparing the mean effect size between groups. This test results in Q_b, the between-group goodness of fit, with an approximate chi-square distribution and $p - 1$ degrees of freedom, where p is the number of groups. When more than two groups were being compared, post hoc contrasts between the mean weighted effect sizes for the groups were computed. These tests are analogous to contrasts in analyses of variance (ANOVA) and approximated by a chi-square distribution with $p - 1$ degrees of freedom for post hoc tests, where p is the number of groups.

Finally, to examine whether sex differences in reports of negative affect could account for sex differences in stress, we conducted WLS regression analyses. The *d* values for stress were predicted from the *d* values for psychological symptoms, weighting for the reciprocal of the variance of the psychological symptom measures. (The analyses were conducted using SPSS, and corrections were then applied to yield accurate estimates of the standard errors of the regression coefficients [19]). We explored the relationship between the effect size for stress and that for psychological symptoms overall and for each psychological symptom measure (i.e. depression, anxiety, and miscellaneous psychological complaints).

RESULTS

A total of 119 studies examining exposure to and appraisal of life stress, work stress, and/or interpersonal stress in 83,559 participants met criteria for inclusion in this meta-analysis and are listed in Appendix A.[2] Table 1 depicts a stem-and-leaf plot of the 141 effect sizes evaluated in the current analyses and illustrates that the findings from this body of work were normally distributed. The number of participants per study ranged from 49 to 13,203, although 83% had more than 100 and 13% more than 1,000 subjects. Additional plots contrasting effect size by sample size (i.e. funnel plots) indicated that the magnitude of the effect did not vary according to the size of the sample (data not shown). The majority of studies included a single measure of stress, and of the 119 studies, 10 explicitly indicated that participants of varied ethnic backgrounds were included in the sample.

TABLE 1
Distribution of Stress Effect Sizes on a Stem-and-Leaf Plot

Stem	Leaf
−0.8	7
−0.7	
−0.6	8
−0.5	2
−0.2	0, 3, 5, 6
−0.1	4, 5, 5, 8, 8
−0.0	1, 1, 1, 2, 2, 7, 9
0	0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0
0.0	1, 1, 2, 2, 2, 2, 3, 4, 4, 5, 6, 6, 6, 7, 7, 8, 8, 8, 8
0.1	0, 0, 0, 0, 1, 2, 2, 2, 3, 3, 3, 4, 5, 5, 8, 8
0.2	0, 0, 0, 2, 3, 4, 4, 6, 6, 7, 7, 7, 8, 8, 8, 9
0.3	0, 1, 1, 1, 2, 2, 2, 2, 3, 3, 4, 5, 5, 5, 6, 6, 8, 8, 9, 9
0.4	2, 2, 2, 3, 4, 5, 8, 9
0.5	0, 1, 1, 2, 2, 5, 5
0.6	3, 4, 5, 6, 9
0.7	
0.8	1

Notes: Each effect size estimate is composed on one stem and one leaf. The numbers in the left column represent the stems or first numerals (the ones and the one-tenths places) in the estimates, and the numbers in the right column represent the leaves or second numerals (the one-hundredths place) in the estimates. Multiple entries in a row indicate that more than one estimate is composed of a given stem. Positive numbers reflect greater stress among females.

Table 2 shows that the mean of 112 weighted effect sizes generated from 94 studies of stress exposure and appraisal was small but statistically significant, with females reporting greater stress than males. The overall effect size was larger in unusual compared to representative samples ($Q_b = 17.32$, $p = .00003$; see Table 2). Additionally, although females reported both more exposure to and appraisal of stress than did males, this gender difference was more marked for stress appraisal ($Q_b = 28.96$, $p < .000001$). The heterogeneity of effect sizes led us to examine the effects of moderator variables separately for stress exposure and appraisal. Our initial step was to determine whether the magnitude of the sex differences varied depending on the recency of publication. We divided studies at the median year of publication (i.e. 1989) and included this dichotomized variable as a moderator in analyses. Results showed that the effect sizes for stress exposure and perception and for representative and unusual samples were not significantly affected by recency of publication, Q_b (1)'s < 2.644, p's $> .104$ (see Table 2).[3]

Influence of Age and Sample Representativeness

Stress Exposure: Less representative samples yielded larger effect sizes overall than did their more representative counterparts, Q_b (1) = 13.20, $p < .0003$ (see Table 3). Age also affected the

[2] Tables listing study characteristics and effect sizes for stress exposure and appraisal are included in Appendices B and C.

[3] Repeating the analyses, with studies trichotomized based on year of publication, did not alter the findings.

TABLE 2

Weighted Effect Sizes: Association Between Sex and Level of Stress Based on Exposure Versus Appraisal and Representativeness of Sample

Studies	*k*	*d*	95% CI	*r*	Homogeneity Within (Qw)
Total	112	+0.123***	+0.10–+0.14	.061	383.93***
Stress Measure					
Stress Exposure	43	+0.076***	+0.05–+0.10	.038	164.30***
Published ≤1989	25	+0.053**	+0.02–+0.09	.027	107.14***
Published ≥1990	18	+0.100***	+0.06–+0.13	.038	54.51***
Stress Appraisal	69	+0.178***	+0.15–+0.21	.089	190.68***
Published ≤1989	31	+0.194***	+0.15–+0.24	.096	82.90***
Published ≥1990	38	+0.166***	+0.13–+0.20	.083	106.80***
Sample Type[a]					
Unusual	54	+0.170***	+0.14–+0.20	.085	194.30***
Published ≤1989	28	+0.203***	+0.15–+0.25	.101	119.80***
Published ≥1990	26	+0.153***	+0.12–+0.19	.076	71.97***
Representative	57	+0.090***	+0.07–+0.11	.045	172.31***
Published ≤1989	27	+0.076**	+0.04–+0.11	.038	77.57***
Published ≥1990	30	+0.105***	+0.07–+0.14	.053	93.33***

Notes: k = number of effect sizes, d = mean weighted effect size, r = correlation corresponding to mean weighted effect size, * $p < .05$, ** $p < .001$, *** $p < .0001$.

[a] One study was not adequately described for reliable coding of sample representativeness.

TABLE 3

Weighted Effect Sizes: Association Between Sex and Stress Exposure by Age and Representativeness of Sample

Age of Sample	*k*	*d*	95% CI	*r*	Homogeneity Within (Qw)
Total					
Unusual Samples	24	+0.126***	+0.09–+0.16	.063	106.97***
Representative Samples	19	+0.032	−0.01–+0.07	.016	44.12**
Children[a]	4	−0.070	−0.18–+0.04	−.035	8.33*
Adolescents	10	+0.121***	+0.07–+0.17	.060	42.35***
Unusual Samples	6	+0.156***	+0.09–+0.23	.079	21.32**
Representative Samples	4	+0.093**	+0.03–+0.16	.046	19.32**
Young Adults	10	−0.049	−0.16–+0.06	−.025	27.68**
Unusual Samples	5	−0.097	−0.25–+0.06	−.048	26.94***
Representative Samples	5	−0.003	−0.15–+0.15	−.002	0.01
Adults	19	+0.079***	+0.05–+0.11	.039	70.72***
Unusual Samples	11	+0.133***	+0.09–+0.18	.066	47.65***
Representative Samples	8	+0.025	−0.02–+0.07	.012	12.27

Notes: k = number of effect sizes, d = mean weighted effect size, r = correlation corresponding to mean weighted effect size, * $p < .05$, ** $p < .001$, *** $p < .0001$.

[a] We did not examine sample diversity in the four studies of children because the studies were too few in number.

effect size, Q_b (3) = 15.21, $p < .002$; females reported more stress in samples that included adolescents or mature adults, but not in samples that included children or young adults. Follow-up contrasts indicated that the effect size for adolescent samples was larger than those of child and young adult samples, χ^2's(1) > 8.1, p's < .05, but similar to the effect size of adult samples. No other group comparisons achieved significance.

Within age groupings, the studies using representative samples of young or mature adults did not yield either significant effect sizes or significant tests of homogeneity of effect sizes. In contrast, among studies of representative samples of adolescents, both the effect size and test of homogeneity of effect size were significant. Overall, among studies with representative samples, age was not significantly related to effect size, Q_b (3) = 3.30, p = .19. Thus, studies of stress exposure yielded null effects for samples of children and representative samples of young and mature adults, but yielded small positive effects among representative samples of adolescents.

Stress Appraisal: Table 4 shows that the effect sizes for stress appraisal were significant for both nonrepresentative and representative samples, but were significantly larger among nonrepresentative samples, Qb (1) = 11.24, p = .0008). Sample age also affected the results, Q_b (3) = 16.24, p = .001. While gender differences were statistically significant for all age groups, post hoc comparisons indicated that the effect sizes were larger among adolescent compared to child samples, χ^2 (1) = 16.18, p = .001.

Within age groupings, effect sizes were smaller among representative samples of children and mature adults, Qb(1)'s > 4.19, p's < .05, but sample representativeness did not influence effect size among adolescent or young adult samples, Qb(1)'s < 1.61, p's > .21. When only representative samples were selected, effect sizes continued to vary by age, Qb(3) = 17.95, p = .0005). Post hoc contrasts revealed that representative samples of adolescents yielded larger effect sizes than those of children and mature adults, χ2's(1) > 10.25, p's < .02, with no other differences apparent between groups, χ2's(1) < 6.20, p's > .10. Stress

TABLE 4
Weighted Effect Sizes of Association Between Sex and Stress Appraisal by Age and Representativeness of Sample

Age of Sample	*k*	*d*	95% CI	*r*	Homogeneity Within (Qw)
Total					
Unusual Samples	30	+0.245***	+0.20–+0.29	.122	72.29***
Representative Samples	38	+0.145***	+0.11–+0.18	.072	107.04***
Children	13	+0.112***	+0.06–+0.16	.056	67.72***
Unusual Samples	5	+0.253***	+0.14–+0.37	.126	14.68*
Representative Samples	8	+0.079**	+0.02–+0.14	.039	46.30***
Adolescents[a]	10	+0.287***	+0.22–+0.35	.142	20.73***
Unusual Samples	5	+0.266***	+0.18–+0.35	.132	9.93
Representative Samples	4	+0.362***	+0.24–+0.48	.178	7.93
Young Adults	25	+0.185***	+0.12–+0.25	.092	48.93***
Unusual Samples	7	+0.200***	+0.08–+0.32	.100	23.37**
Representative Samples	18	+0.180***	+0.11–+0.25	.090	25.49
Adults	21	+0.175***	+0.13–+0.22	.089	37.06***
Unusual Samples	13	+0.243***	+0.16–+0.32	.121	23.50*
Representative Samples	8	+0.142***	+0.09–+0.20	.071	9.37

Notes: k = number of effect sizes, d = mean weighted effect size, r = correlation corresponding to mean weighted effect size, * $p < .05$, ** $p < .001$, *** $p < .0001$.

[a] For one study of adolescents, insufficient information was provided by the authors to allow for coding of sample representativeness.

TABLE 5
Weighted Effect Sizes of Association Between Sex and Stress Appraisal by Age of Sample and Type of Stress Appraisal

Age of Sample	*k*	*d*	95% CI	*r*	Homogeneity Within (Qw)
Total					
Daily Stress	39	+0.144***	+0.11–+0.18	.072	90.81***
Life Events	30	+0.245***	+0.20–+0.29	.121	88.30***
Children					
Daily Stress	9	+0.044	−0.02–+0.10	.022	26.88***
Life Events	4	+0.373***	+0.26–+0.49	.184	15.16**
Adolescents					
Daily Stress	6	+0.217***	+0.13–+0.31	.108	7.82
Life Events	4	+0.371***	+0.27–+0.47	.182	7.98
Young Adults					
Daily Stress	10	+0.220***	+0.12–+0.32	.110	18.11
Life Events	15	+0.162**	+0.08–+0.24	.081	30.01*
Adults					
Daily Stress	14	+0.180***	+0.13–+0.23	.090	20.04
Life Events	7	+0.116**	+0.07–+0.25	.080	16.89*

Notes: k = number of effect sizes, d = mean weighted effect size, r = correlation corresponding to mean weighted effect size, * $p < .05$, ** $p < .001$, *** $p < .0001$.

appraisal effect sizes were homogeneous among representative samples of adolescents, young adults, and mature adults, suggesting that these effect sizes adequately reflect those in the literature for these age groups.

Influence of Type of Stress

Table 5 shows that effect size was dependent on the type of stress appraisal, with more pronounced gender differences apparent for appraisal of major life events versus daily stress in the studies overall, $Qb(1) = 11.57$, $p = .00007$.[4] However, post hoc examination of effect sizes for each type of stress within age grouping indicated that this pattern was only apparent among studies that included children or adolescents, $\chi 2$'s (1) > 4.93, p's < .03), and not among samples of young adults and mature adults, $\chi 2$'s (1) < .80, p's > .37. Effect sizes for daily stress among young and mature adults tended to be homogenous, indicating that these effect sizes are representative of studies in the literature.

Women reported greater levels of stress than men both at work ($n = 22$, mean $d = .065$, $p = .00004$) and in interpersonal relationships ($n = 7$, mean $d = .165$, $p = .0001$), but the magnitude of the difference was more marked in studies examining interpersonal stress, $Qb(1) = 11.12$, $p < .0009$. Further, while the effect sizes among investigations of interpersonal stress were homogeneous ($Qw = 7.27$, $p = .40$), the effect sizes among investigations examining job stress were highly variable ($Qw = 57.27$, $p = .00004$).

Results of further analyses of job stress studies, shown in Table 6, indicate that effect sizes were significant and comparable among studies that did match versus did not match men and women based on job level, Qb (1) = 1.19, $p = .28$). Furthermore, effect sizes were positive for both job stress exposure and appraisal but were more marked for job stress appraisal, Qb (1) = 4.97,

[4] Analyses including only studies with representative samples produced the same pattern of findings, with larger effect sizes for events versus hassles in samples of children and adolescents but not among young and mature adults.

TABLE 6
Weighted Effect Sizes of Association Between Sex and Job Stress Based on Sample Matching and Job Stress Measure

Moderator	*k*	*d*	95% CI	*r*	Homogeneity Within (Qw)
Job Stress Characteristic[a]					
Exposure	7	+0.043**	+0.23–+0.06	.022	21.79**
Appraisal	16	+0.093***	+0.06–+0.12	.047	40.47**
Job Level					
Matched	10	+0.043*	+0.01–+0.07	.021	22.41*
Nonmatched	12	+0.067***	+0.05–+0.09	.033	43.26***

Notes: k = number of effect sizes, d = mean weighted effect size, r = correlation corresponding to mean weighted effect size, * $p < .05$, ** $p < .001$, *** $p < .0001$.
[a] One study contributed an effect size for both exposure and appraisal of work stress.

TABLE 7
Weighted Effect Sizes of the Association Between Sex and Psychological Symptoms Based on Type of Symptom Measure

Moderator	*k*	*d*	95% CI	*r*	Homogeneity Within (Qw)
All Psychological Symptoms	47	+.282***	+.26–+.31	.139	117.74***
Depressive Symptoms	21	+.252***	+.21–+.29	.125	117.32***
Anxiety Symptoms	9	+.378***	+.32–+.44	.186	19.35*
Miscellaneous Symptoms	17	+.277***	+.23–+.32	.137	26.49

Notes: k = number of effect sizes, d = mean weighted effect size, r = correlation corresponding to mean weighted effect size, * $p < .05$, ** $p < .001$, *** $p < .0001$.

$p = .03$). Tests of homogeneity of effect size were significant for job stress exposure and appraisal and for matched and nonmatched samples, indicating that these effect sizes are highly variable.

The Influence of Sex Differences in Psychological Symptoms

Thirty-nine studies included measures of psychological adjustment and yielded 47 effect sizes reflecting sex differences in negative affect. As depicted in Table 7, the effect size for negative affect overall was significant, reflecting higher levels among females relative to males, but the effect was heterogeneous. Further analyses suggested that effect size varied according to the type of symptoms measured, Q_b (2) = 8.58, $p = .01$, and post hoc comparisons indicated that the effect size for anxiety symptoms was more pronounced than the effect sizes for depression, $\chi 2(1) = 8.52$, $p = .01$, and miscellaneous psychological complaints, $\chi 2(1) = 5.05$, $p = .08$. Thus, the composite effect sizes for psychological symptom measures were heterogenous, and the discrepancy between males and females in reporting of psychological symptoms was most striking for measures of anxiety.

Of the 39 studies that included psychological symptom measures, 27 included one measure each of symptoms and stress, 4 included two measures of symptoms (e.g. anxiety and depression) and one of stress, 4 included one measure of symptoms and two of stress (i.e. exposure, perception), and 4 included two measures of both symptoms and stress. Together, the studies generated 59 pairs of stress and psychological symptom effect sizes, 57 of which were included in the evaluation.[5] In the initial weighted regression analysis of all 57 pairs of effect sizes, symptom effect size was a marginally significant predictor of stress effect size, Beta = .141, $t(55) = 1.90$, $p = .06$, accounting for 4.4% of the variance. Additional regression analyses examining each type of psychological symptom measure revealed that the sex difference in stress was not significantly related to sex differences in depression, Beta = .048, $t(23) = .500$, $p = .618$, or anxiety, Beta = .179, $t(11) = .876$, $p = .381$, each of which accounted for less than 1% of the variance in stress effect size. The effect size for miscellaneous psychological symptoms was also not a significant predictor of the effect size for stress, Beta = .219, $t(17) = 1.42$, $p = .155$, although it did account for approximately 4% of the variance. Thus, measures of a wide variety of psychological functioning accounted for only a small portion of the variance in sex differences in stress.

DISCUSSION

The current review yielded several notable findings with regard to gender differences in the experience of stress. First, females reported both greater exposure to and appraisal of stressful events than did males. However, the results were stronger for indicators of stress appraisal, which have a clearer subjective component, than for indicators of stress exposure, which presumably are more objective. Thus, females are somewhat more likely to report detecting events in their environments and much more likely to rate events as intense compared to males.

Undoubtedly, the true causes of the observed effects are several and interrelated. One possibility is that social norms that promote stoicism among males and emotional expressiveness among females may make it likely that males will report fewer stressful experiences than females. Along this line, Grossman and Wood (23) found that among individuals who have stereotypic expectations about sex differences in emotional responsiveness, females reported experiencing emotions of greater intensity and males of lesser intensity. Yet, when expectations regarding emotional responsivity were manipulated to make them comparable for males and females, no sex differences in self-reported emotional responsiveness emerged. Thus, the self-reported intensity of experience appears highly dependent on socialized expectations regarding gender role. If stress experience is confounded with affective experience, the observed gender differences in stress may partially

[5] Regression diagnostics revealed that the analysis including all 59 pairs of effect sizes were inordinately affected by two outliers. These two studies were therefore excluded from subsequent analyses. Additionally, repeating the analyses including only the 27 studies that contributed one effect size each for stress and psychological symptoms did not alter the findings.

reflect conformity to expectations about emotional expression for males and females.

We explored the possibility that sex differences in stress are due to differences in the willingness to report psychological problems between the sexes, by examining the extent to which sex differences in reports of psychological symptoms were related to sex differences in reports of stress. Females did indeed report experiencing more psychological symptoms of all kinds, particularly those reflecting anxiety, than did males. Yet, the magnitude of the sex difference in symptom reporting was only marginally related to the sex difference in the experience of stress, accounting for only about 4% of the variance. Thus, sex differences in stress exposure and appraisal do not appear to simply reflect a general propensity of females to report more psychological symptoms. This interpretation of the data is consistent with results reported by Mirowsky and Ross (24), who found that levels of distress were greater among women compared to men, even after adjusting for differences in emotional expressiveness.

If the findings are not merely artifacts of reporting differences, then they may reflect the effects of gender role socialization on how individuals interpret environmental demands. Because socially desirable qualities for males include individuality and autonomy, males may be inclined to evaluate their experience of an event depending on how it impacted them and them alone. They may simply be less aware of and/or less responsive to the impact of their own events on the lives of important others in their networks. In contrast, socially desirable qualities for females include interdependence and attunement to others' feelings, potentially making females very aware of the impact of their own events on their intimates (25). This may lead them to consider the impact of events in the broadest possible terms, so that their ratings actually represent a composite of the impact of events on themselves and on important others. In concrete terms, when evaluating the impact of a marital fight, a husband's ratings might reflect how he thinks the fight affected him, whereas a wife's ratings might reflect how she thinks the fight affected not only her but also her husband and children.

In fact, we found that gender differences in stress are most apparent with regard to interpersonal stress, in line with a socialized gender role that emphasizes communality and emotional expressiveness for females. Using methodologies that require participants to identify a single problem to evaluate, other investigators have also found that women report on situations related to their families (26–28) or other people (28) more frequently than do men. This by no means implies that males are unaffected by relationship problems or events happening to others but simply that these types of problems may be especially troubling for women, perhaps because they threaten a sense of competency in a core role. As a result, women may be at heightened risk for the negative consequences of interpersonal problems. For example, although interpersonal conflict is related to subsequent levels of distress for both men and women, the relationship is stronger for women (29). Other data suggest that adolescent and adult females experience more distress than their male counterparts in response to negative events that happen to others in their interpersonal networks (13,30,31).

A second notable finding was that the greater exposure and appraisal of stress among females relative to males was most marked among adolescents. Why are gender differences in stress more substantial among teenagers relative to other age groups? Adolescence is a key developmental stage characterized by radical and rapid changes in physical attributes and social expectations. Concerns regarding dating and sexuality become more prominent; peer relationships take on new importance; and decisions about future education and career options loom large. Although these changes occur for boys as well as girls, some argue that adolescence is a more difficult transition for girls (32). For example, sex-typed expectations for boys (e.g. to achieve) are highly valued and do not conflict with their changing social relationships during adolescence. Expectations for girls are more complex, including demands both to achieve and to be successful in interpersonal relationships. During adolescence, these demands may collide as girls become involved in relationships with boys who do not want them to compete (33). Caught between expectations that are not easily reconciled, girls may constantly feel in jeopardy of failing in critical roles, which may heighten their experience of environmental events. Greater appraisal of stress among females relative to males holds for both daily hassles and major life events and is most pronounced for life events among children and adolescents. This suggests that the overall findings are not due to females simply complaining more about minor irritations but rather to the greater experience of stress among females across levels of stressor severity.

A third pattern in our findings indicates that gender differences in the experience of stress are more pronounced among samples composed of individuals who are less representative versus more representative of the population at large. The group of less representative studies included unusual samples that tended to be very diverse, including studies of gifted students, high school athletes, attendees at stress reduction workshops, and centegenarians, among others. We are inclined to interpret the effect sizes of the representative samples as more accurate depictions of the magnitude of differences in the population because they were not based on unusual or extreme samples, which might have been comprised of highly stressed participants, and they more often generated nonsignificant tests of homogeneity of effect sizes.

Women also reported significantly greater levels of stress in the workplace compared to men. The effect emerged in samples of men and women of similar and different job levels and in studies assessing exposure to versus appraisal of work stress. However, nearly every investigation included in this synthesis failed to control for important differences between men and women both in and out of the workplace. For example, men frequently are older, have been on the job longer, and make more money than women, even when they occupy similar job positions (34–36). Thus, women may be exposed to more demands that they find novel and may spend more time and energy establishing themselves and learning new work skills than their male counterparts. Additionally, employed men and women experience different nonwork demands as noted earlier, with women reporting that they continue to have greater responsibility for care of home and family. These home responsibilities may, in fact, spill over into the workplace more often for women than for men, making the situations they encounter at work somewhat more stressful.

In another meta-analysis, Martocchio and O'Leary (37) examined 15 studies of sex differences in occupational stress as reflected by psychological markers (e.g. emotional strain, depressive symptoms, Type A behavior) and physiological markers (e.g. systolic blood pressure, coronary heart disease) of stress. They concluded that there are no differences between men and women in the psychological or physiological manifestations of stress in a work setting. Together, the findings across these two meta-analyses of distinct literatures indicate that although women experience somewhat more stress in the workplace than do men, the sexes

have similar levels of psychological and physical symptoms associated with their work environments. The fact that differences emerge for work stress but not for symptoms argues against the notion that sex differences in work stress are due to women over reporting negative experiences.

Because studies that report significant findings may be more likely to be published than are those that report null findings, it is possible that the current analyses were carried out on a biased sample of studies. The distribution of study effect sizes included in this synthesis suggest that this was not the case. To address this possibility further, we calculated a "failsafe *n*," or the number of unpublished studies with an average effect size of zero that would be necessary to render the findings from the current analyses nonsignificant (38). Recall that effect sizes were significant for stress exposure across all studies (failsafe = 237) and for studies of adolescents (failsafe = 61) and mature adults (failsafe = 89) considered separately. The current analysis also yielded sex differences for stress appraisal for all studies, studies with representative samples, and studies focused on each age group. Failsafe values for stress appraisal are 2,600 for all studies, 457 for studies of representative samples, 53 for studies of children, 119 for studies of adolescents, 195 for studies of young adults, and 175 for studies of mature adults. Finally, the significant effects for work stress would be offset by 219 studies and for interpersonal stress by 81 studies, reporting null findings. In each instance, the failsafe *n* is sufficiently large as to suggest that it is unlikely that enough unpublished studies exist to offset the current findings. In addition, because studies that have not undergone peer review or have been rejected for publication are of unknown quality, it is difficult to know the extent to which unpublished data should be of major concern in interpreting the results of published studies.

Although the effect sizes generated in the current analyses are generally modest, they are potentially quite significant. One method of demonstrating the practical importance of an effect size is the binomial effect size display (BESD) (39), which is presented as a difference in outcome rates between two groups. In terms of a BESD, the difference between males and females in interpersonal stress ($d = 0.171$) represents a 9% disadvantage of females compared to males. The most substantial effect size we observed was associated with stress appraisal among representative samples of adolescents. Among these four studies, which generated an effect size of $d = .362$, the disadvantage of females is nearly 18%. When we consider that these effects depict only a snapshot in time, encompassing a year or less in the lives of the participants, the implications become even more profound. Differences, even the relatively small ones we observed, may accumulate over time and have a meaningful impact on long-term health. Consider the randomized clinical trial that examined the effects of aspirin in reducing heart attacks; it was terminated prematurely because the effectiveness of aspirin was considered so dramatic at an r of .034 that continuation of the study was deemed unethical (40).

We have focused in the current review on the role of sex in determining stress exposure and the subjective experience of stress, but have left unexplored how sex may interact with coping and/or physiological responses to predispose men and women to different health problems. In fact, the impact of sex differences in stress exposure and appraisal may be either outweighed or exacerbated by sex differences in coping or physiological responses or in physiological vulnerability to particular disorders. Until methods that capture the cumulative nature of daily and major life events are used in conjunction with assessment of coping responses and verifiable health outcomes, the far-reaching consequences of moderate differences in the experience of stress between males and females observed in the current review remain to be determined.

Conclusions that can be drawn from these findings are constrained by the significant limitations of the investigations included in this review. Among the most important considerations is the nature of the major and minor life event measures (for reviews, see 41–44). Distortions in reporting may occur due to faulty memory when individuals are asked to report events from a time frame ranging from several weeks in the past to lifetime experience. Although no existing data point to this possibility, the greater stress reported among females relative to males may, in fact, reflect sex differences in memory processes. Further, inclusion in some instruments of items that may reflect distress reactions (e.g. change in sleep) rather than discrete stressful events themselves makes it difficult to disentangle exposure to stressful episodes from responses to those episodes. If sex differences in reporting of distress contributed substantially to the sex difference in stress documented in the current analyses, however, it is likely that sex differences in psychological symptoms would be significantly and positively related to sex differences in stress, a pattern we did not observe for anxiety, depression, or psychosomatic symptoms. Finally, as noted earlier, a few instruments included sex-specific stressors that most often related to female reproductive function (e.g. pregnancy, missed period). Because these instances occurred so rarely among studies included in this review, they are unlikely to account for the current pattern of findings.

A second serious limitation is the relative dearth of data generated from diverse samples that included ethnic minorities, a broad distribution of socioeconomic groups, and all ages. A vast majority of the investigations reviewed focused on well-educated Caucasians, particularly in studies of young adults who were typically college students. These individuals may experience fewer serious, chronic, or immutable problems than their low socioeconomic status (SES) or minority counterparts and may have greater access to resources. There is every reason to expect that the current findings will not hold for ethnic minorities, who may experience unique gender role socialization or stresses such as racism specific to their own cultures. Similarly, the life problems of males and females who are poor and less educated may be qualitatively and quantitatively different from those of the middle-class.

Finally, a note of caution is warranted in interpreting the current findings. Although many of the effect size comparisons were conducted on a large number of studies, some were carried out on as few as four studies. It is not clear how many studies are required to generate a useful effect size estimate, but inclusion of more studies certainly provides more stable results (45). Additionally, the moderator variables we included in the analyses were significant; however, substantial variability in effect sizes remained unexplained. We are most confident regarding the findings based on homogenous effects sizes: those from representative samples of young and mature adults for stress exposure; from adolescents, young adults, and mature adults for stress appraisal; and from daily stress for adolescents, young adults, and mature adults. The findings suggest that, for these groups at least, the composite effect size is an accurate representation of the constituent studies.

Nevertheless, because the fixed effects analyses that we conducted did not yield models that explained all the variation in effect size parameters, we are left to consider possible explanations for the residual variance. One possibility is that the heterogeneity is due to study characteristics that we did not examine. In this realm,

the most likely candidates are aspects of the stress measures employed in this literature. Retrospective self-report measures were used in all the investigations included in this review, but a number of those measures were developed for the purposes of a specific investigation. Thus, variations in item content or phrasing across investigations may have contributed to variation in the magnitude of the sex difference. A second alternative explanation is that a fixed effects model simply does not provide an accurate representation of the data. A fixed effects approach assumes that true effect sizes vary only as a result of a few identifiable study characteristics, and results may be used to draw inferences only about studies with similar characteristics. A random effects approach, on the other hand, assumes that true effect sizes vary, at least in part, as a function of multiple, unidentifiable sources, and results generated from a random effects analysis can be used to make inferences about the universe of diverse studies (46). In the current synthesis, we used a fixed effects strategy because of similarities in sample characteristics (e.g. race, socioeconomic status) and stress measures (i.e. self-report events instruments) of the studies reviewed, with the intention of drawing inferences only about similar studies.

Our understanding of the stress experiences of males and females would benefit from several shifts in current research methods. Perhaps the most pressing need in the literature is the assessment of broader, more diverse samples. Exploration of stress exposure and perception among males and females from different ethnic, cultural, and SES groups would build on the fairly abundant data from middle-class Caucasians to provide important information regarding individual differences in the experience of stress.

Emphasis on a lifespan development perspective would also extend our current conceptions of the stress process. Life events have generally been assessed at very few points in time within a relatively short time frame, a format that has provided little sense of the ongoing and dynamic nature of stress process. Environmental demands and role obligations clearly change over the course of development, and interpretation of and coping with events takes place in the context of an ever-growing body of life experience. A longitudinal approach with emphasis on lifespan changes would permit a more accurate portrayal of stress experiences and their impact on health, in males and females.

In addition, widespread use of methods that emphasize within-individual variation would increase our understanding of behaviors that are not extreme enough to override personality or environmental factors that vary across people. Focus in the past on inter-group rather than intra-individual comparisons may have obscured meaningful individual differences in stress experience. New methods of frequent monitoring of daily stress within individuals and novel methods of analysis are being used to study stress as a factor eliciting clinical symptoms (e.g. 47). These techniques can be applied to the study of gender and stress and would permit evaluation of the cumulative burden experienced as clusters of events overlap and interact to affect functioning.

In summary, the existing literature of major and minor life events indicates that stress is sometimes more frequent and usually more intense across the lifespan and across domains in females compared to males. It is noteworthy that none of the current results point to significantly greater stress among males, leading us to conclude that life is indeed more difficult on Venus. Given the conceptual importance of stress in models of illness and disease, especially in diseases that differ in prevalence by gender, it is critical that explicit tests of the moderating effects of gender be conducted. In this way, we can discern whether our common stereotypes about gender and their social and biological underpinnings do have an influence on the stress experience of males and females and, in turn, on stress-related diseases.

APPENDIX A

Articles Included in Meta-Analysis

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APPENDIX B

Characteristics of Studies of Stress Exposure Included in Meta-Analysis

Authors	Age Group	Effect Size[a]	*N*
Aro (1987)	Adolescents	0.153	2001
Avison and McAlpine (1992)	Adolescents	−0.153	306
Bradley (1980)	Adults	0.523	60
Brown and Cowen (1988)	Children/Adolescents	−0.021	503
Compas, Slavin et al. (1986)	Adolescents	0.495	243
Cooper et al. (1992)	Adults	0.120	1316
Dean and Enzel (1983)	Adults	−0.147	1084
Dise-Lewis (1988)	Children/Adolescents	0.239	198
Dohrenwend (1973)	Adults	−0.676	124
Flannery (1986)	Young Adults	0.415	97
Groer et al. (1992)	Adolescents	0.379	167
Hamilton and Faggot (1988)	Young Adults	0	90
Hoffman et al. (1993)	Children/Adolescents	−0.183	63
Husaini et al. (1991)	Adults	0.077	608
Johnston and Page (1991)	Adults	0.264	224
Jorgensen and Houston (1989)	Young Adults	0	107
Jorgensen and Johnson (1990)	Young Adults	−0.016	147
Kale and Stenmark (1983)	Adults	0.127	125
Kendler et al. (1993)	Adults	0.058	4630
Larson and Ham (1993)	Children/Adolescents	−0.233	485
Lichenstein and Pederson (1995)	Adults	0.321	1152
Marron and Kayson (1984)	Young Adults	0	160
Martin et al. (1992)	Adults	0	221
Marziali and Pilkonis (1986)	Adults	0.333	260
Masuda and Holmes (1978)	Adults	0.082	969
McFarlane et al. (1994)	Adolescents	0.133	648
Newcomb et al. (1981)	Adolescents	0	1018
Newcomb et al. (1986a, b)	Adolescents	0	376
Okun et al. (1986)	Young Adults	0	214
Pilisuk et al. (1993)	Adults	0.059	84
Rubin et al. (1992)	Adolescents	0	300
Ryff and Dunn (1985)	Adults	0.342	168
Shaw (1982)	Young Adults	0	77
Shepperd and Kashini (1991)	Adolescents	0.629	150
Smallman et al. (1991)	Young Adults	0.266	53
Somes et al. (1981)	Young Adults	0	214
Sowa and Lustman (1984)	Young Adults	−0.873	140
Szinovacz and Washo (1992)	Adults	0.289	811
Thoits (1987)	Adults	0.032	1106
Tolor and Murphy (1985)	Adolescents	−0.087	613
Tubman and Windle (1995)	Adolescents	0.257	975
Turner et al. (1995)	Adults	0.009	1393
Uhlenhuth et al. (1974)	Adults	0	735
Zimmerman-Tansella et al. (1991)	Adults	0.062	451

[a] 0 = Males, 1 = Females.

APPENDIX C

Characteristics of Studies of Stress Appraisal Included in Meta-Analysis

Authors	Age Group	Effect Size[a]	N
Allgood-Merton et al. (1990)	Adolescents	0.280	664
Bobo et al. (1986)	Children/Adolescents	0.267	246
Bradley (1980)	Adults	0.523	60
Brown and Cowen (1988)	Children/Adolescents	0.546	503
Burke and Weir (1978)	Adolescents	0.383	156
Burt et al. (1988)	Children/Adolescents	0	312
Cahir and Morris (1991)	Young Adults	0.345	133
Caldwell et al. (1987)	Young Adults	0.020	367
Compas, Howell et al. (1989)	Children/Adolescents	0.477	211
Cooper et al. (1992)	Adults	0.283	1316
Crandall et al. (1992)	Young Adults	0.453	86
Dise-Lewis (1988)	Children/Adolescents	0.442	198
Etzion (1984)	Adults	0.320	630
Fimian and Cross (1986)	Adolescents	0	121
Flannery (1986)	Adults	0.505	97
French et al. (1995)	Adults	0	268
Gannon and Pardie (1989)	Young Adults	0.349	228
Grannis (1992)	Adolescents	−0.253	90
Hamilton and Faggot (1988)	Young Adults	0.810	90
Hendrix et al. (1994)	Adults	0.148	374
Hovanitz (1986)	Young Adults	−0.014	267
Hudson and O'Reagan (1994)	Young Adults	0.041	256
Johnson (1992)	Young Adults	0.053	102
Johnson and McCutcheon (1980)	Adolescents	0.133	213
Johnston and Page (1991)	Adults	0.315	224
Jorgensen and Houston (1989)	Young Adults	0	107
Jorgensen and Johnson (1990)	Young Adults	0.235	147
Kale and Stenmark (1983)	Adults	0.284	125
Kanner et al. (1981)	Adults	−0.009	100
Kanner and Feldman (1991)	Children/Adolescents	0.019	140
Kanner et al. (1987)	Children/Adolescents	0	232
Karr and Johnson (1991)	Children/Adolescents	−0.144	296
Kearney et al. (1993)	Children/Adolescents	−0.262	478
Kohn et al. (1990)	Young Adults	0.390	206
Kohn et al. (1994)	Adults	0.204	239
Lewis et al. (1984)	Children/Adolescents	0.079	2480
Linden et al. (1993)	Young Adults	0.307	129
Lu (1991)	Adults	0.140	50
Mallinckrodt and Leong (1992)	Young Adults	0.642	166
Nacoste and Wise (1991)	Adults	−0.183	57
Nelson and Cohen (1983)	Young Adults	0.364	192
Obrien and Iannotti (1993)	Children/Adolescents	0	380
Osman et al. (1994)	Young Adults	0.302	216
Price and Spence (1994)	Adults	0	120
Rawson et al. (1994)	Young Adults	0.200	184
Roos and Cohen (1978)	Young Adults	0	109
Rowlinson and Felner (1988)	Adolescents		
	Hassles	0.181	682
	Events	0.387	682
Ryff and Dunn (1985)	Adults	0.661	168
Scott (1992)	Adults	0.639	59
Shaw (1982)	Young Adults	0	77
Smallman et al. (1991)	Young Adults	−0.202	53
Stoppard and Paisley (1987)	Young Adults	0.098	402
Swearington and Cohen (1985)	Children/Adolescents	0.325	233
Thomas (1989)	Adults	0	139
Tolan et al. (1988)	Adolescents	0.430	84
Towbes et al. (1989)	Adolescents	0.219	443
Turner et al. (1995)	Adults	0.117	1393
Vingerhoets and Van Heck (1990)	Adults		997
	Hassles	0.117	
	Events	0.083	
Wagner and Compas (1990)	Children/Adolescents	0.689	237
	Young Adults	0.492	145
Wise and Barnes (1986)	Young Adults	−0.517	49
Wohlgemuth and Betz (1991)	Young Adults	0.420	115
Wolf et al. (1987)	Young Adults	0	55
Zika and Chamberlain (1987)	Adults		
Study 1		0	120
Study 2		0	161
Zuckerman (1989)	Young Adults	0	931

[a]0 = Males, 1 = Females.

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