DOCUMENT RESUME

ED 450 303 CG 030 711

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TITLE Women, Anger Expression, Relational and Health Consequences: A Review of the Literature.
PUB DATE 2000-12-00
NOTE 76p.; Doctoral Research Paper, Biola University.
PUB TYPE Dissertations/Theses (040)
EDRS PRICE MF01/PC04 Plus Postage.
DESCRIPTORS Affective Behavior; *Anger; *Females; *Health; *Literature Reviews; Measures (Individuals); *Mental Health; Sex Role

ABSTRACT

Women's anger expression style has been the focus of several recent studies and has been demonstrated to have deleterious effects on emotional and physical health. The purpose of this study was to review the empirical literature for women's anger expression style and related health and relational consequences. The study reviewed emotion induction, self-report inventories and questionnaires as well as activities to evaluate stress, health, and emotional reactions. What can be surmised from this study is that not much more is known now than prior to completion of the research. Results show that younger women may be likely to express their anger more freely, but this finding may be the result of the sample and the impact of society. Women are still more conflicted about expressing anger then men are. Whether this is due to the role of relationship in a woman's life or the level of mutuality in the relationship is yet to be discovered. It is known that societal changes have turned the role of women upside down. The review addresses questions raised by this research and concludes with a discussion of future directions and goals for research in this area. (Contains 50 references.) (MKA)

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WOMEN, ANGER EXPRESSION, RELATIONAL AND HEALTH CONSEQUENCES: A REVIEW OF THE LITERATURE

by

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WOMEN, ANGER EXPRESSION, RELATIONAL AND HEALTH CONSEQUENCES: A REVIEW OF THE LITERATURE

A Doctoral Research Paper

Presented to

the Faculty of the Rosemead School of Psychology

Biola University

In Partial Fulfillment

of the Requirements for the Degree

Doctor of Psychology

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December, 2000

ABSTRACT

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Women's anger expression style has been the recent focus of several studies and has been demonstrated to have deleterious effects on emotional and physical health (Anderson& Lawler, 1995; Kopper, 1993; Nunn & Thomas, 1999). The purpose of this study was to review the empirical literature for women's anger expression style and related health and relational consequences. The study reviewed emotion induction, self-report inventories and questionnaires as well as activities implemented to evaluate stress, health and emotional reactions. The review addressed questions raised by this research and concluded with a discussion of future directions and goals for research in this area.

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Introduction

The purpose of this study is to review the empirical literature regarding women's anger expression style and the health and relational consequences attached to each style. Anger is an emotion that is experienced by every person. As long as one has a heartbeat, it is likely that anger will be experienced. Do women, in general, have a difficult time expressing or acknowledging anger? Do societal and cultural constraints exist for women against the expression of anger? As women outnumber men in the general population and far outnumber men in seeking psychological treatment, it behooves the mental health practitioner to gain a better understanding of the female experience of anger, both psychologically and culturally. What changes have occurred in the field of psychology since the introduction of a feminist perspective? Has new knowledge emerged for the treatment of women? This literature review will focus on current literature and their empirical findings on women's anger expression and the related health and relational consequences of that expression. It will address questions raised by this body of research and suggest future directions and goals for research in this area. Studies implementing inventories and questionnaires around the issue of anger expression, studies including inventories and questionnaires as well as the use of activities to evaluate stress, health

and emotional reactions, and studies that implement emotion induction will be explored.

Methodological Considerations

Research in the field of women's anger expression and relational and health consequences are constrained by many factors. The foremost is the difficulty of studying women's anger expression. Due to societal and cultural constraints, women may be unlikely to express their anger (Sharkin, 1993), much less participate in a study designed to look at anger expression. Current literature on the topic provides only three useful options for researching anger expression patterns. One option calls for the creation of a contrived environment in which participants are induced to express emotions in an artificial setting (Faber & Burns, 1996; Malatesta-Magai, Jonas, Shepard, & Culver, 1992; Nunn & Thomas, 1999; Vitaliao, Russo, Bailey, Young, & McCann, 1993). The second relies on self-report questionnaires and activities implemented to evaluate a health, stress or emotional reaction (Anderson & Lawler, 1995; Burns, 1995; Martin & Watson, 1997; Siegman, Townsend, Blumenthal, Sorkin, & Civelek, 1998). A third option relies on self-report measures alone (Fischer, et al., 1993; Kopper, 1993; Kopper & Epperson, 1991; Moreno, Selby, Fuhriman, & Laver, 1994; Newman, Gray, & Fuqua, 1999; Sperberg & Stabb, 1998; Thomas, 1997). Self report measures may be flawed by societal and cultural taboo and a wish on the part of the subject to 'look good', known as social desirability, which can result in denial of true emotional reactions or a downplaying of anger expression. Reliable and valid research must contend with these constraints while producing robust results and meaningful data.

Definition of Terms

Before proceeding further it is necessary to clarify some of the terms utilized in this literature review, such as anger expression, anger-in and anger-out, anger-discuss, trait anger, anger symptoms, current literature, Type A and Type B, and sex role identity. Relational and health consequences must also be operationalized.

Anger and anger expression. Definitions of anger expression in the research are inconsistent. The majority of studies neglect to differentiate between hostility and anger. Hostility and anger are often used interchangeably (Anderson & Lawler, 1995; Burns, 1995; Kopper, 1993; Malatesta-Magai et al., 1992; Novaco, 1975). Research often found mistrust and cynicism to be the cognitive components of hostility, which seemed to deter relationships and increase isolation. Moreno et al., (1994), proposed the following definition of hostility, which incorporates anger: a negative orientation towards others that has cognitive, affective, and behavioral manifestations. Anger has been defined as an emotional state and anger expression as a behavioral response to anger (Nunn & Thomas, 1999). As a result of the variability of definition in the research literature, anger, as referred to in this review, will denote an affective response to persons or events, including behavioral manifestations such as somatic responses and verbal and physical expression, but excluding hostility's mistrust and cynicism.

There are strengths and limitations associated with this literature based definition. The benefit of deriving a definition from the studies themselves allows for greater generalizations across studies. The greatest limitation is the assumed homogeneity between various women groups and their expression of anger. Utilizing a more inclusive

definition of anger ignores both inter-group and intra-group differences, compromising the generalizibility of the study. Unfortunately, the current state of research literature will not allow for more specific or differentiated definitions.

Anger-discuss. Anger-discuss is anger that is directed outward in a healthy way, usually fostering discussion and a sense of relief in the person, once feelings are shared.

Anger-in. Anger-in is generally described as suppressed anger, felt but not expressed outwardly (Spielberger et al., 1985). It involves full awareness that one is experiencing angry feelings and conscious inhibition of anger expression (Thomas, 1997). According to Goldstein, Edelberg, Meier, & Davis (1988), suppression is likely to be used when one believes that anger is sinful or harmful, when one has previous experiences of retribution regarding overtly expressed anger, or when situational or cultural constraints were perceived and followed (i.e., the need to present a nonangry public self).

Anger-out. Anger-out is generally described as anger ventilated or expressed in the form of verbal or physical aggression (Frankel, 1992; Miller & Surrey, 1990). Anger-out may be directed toward other people or objects (Spielberger et al., 1985). It is likely to be directed outwardly in a manner that attacks or blames others (Thomas & Williams, 1991).

Anger symptoms. Anger symptoms include headaches and other somatic complaints that allow a person to express anger through somatic symptoms.

Trait anger. Trait anger is defined as a relatively stable personality trait comprising one's proneness to perceive situations as anger provoking and to respond with

subjective feelings of annoyance, irritation or fury (Spielberger, Jacobs, Russell, & Crane, 1983).

Type A. Type A refers to a cluster of behaviors reflecting impatience, time urgency, competitiveness, anger, aggression, and hostility. Type A persons respond to others with irritation and impatience. Type A women may react with anger to a sense of powerlessness and lack of control when facing a world that is perceived as overwhelming and uncertain. Anger, for Type As, occurs in situations that involve self-esteem, insecurity, impatience, autonomy, affiliation or a sense of injustice (Anderson & Lawler, 1995; Kopper, 1993; Malatesta-Magai et al., 1992; Vitaliano et al, 1993).

Type B. Type B refers to a cluster of behaviors reflecting patience, compliance, cooperation and ease of relating (Anderson & Lawler, 1995; Kopper, 1993; Malatesta-Magai et al., 1992; Vitaliano et al., 1993).

Sex role identity. Sex role identity includes feminine, masculine, androgynous, and undifferentiated classifications, reflecting how persons perceive themselves (Kopper, 1993; Kopper & Epperson, 1991). Although sex role identity was a major focus of two research articles, very little was reported in terms of the definition of classifications. This lack of elucidation of classifications weakens the impact of the research findings.

Health consequences. Health consequences range from essential hypertension (EH), (Diamond, 1982; Ewart, 1991) and coronary heart disease (CHD), to cancer, arthritis and asthma (Appel, Holyrod, & Gorkin, 1983; Booth-Kewley & Friedman, 1987). Excessive cardiovascular reactivity (CVR), the propensity to respond to behavioral stressors with increased heart rate and blood pressure increasing the risk of the

later development of cardiovascular diseases such as Coronary artery disease (CAD) and CHD, has been found to be linked with a hostile style of relating, specifically anger-in for women (Anderson & Lawler, 1995).

Relational consequences. Relational consequences as a term must also be operationalized. Mutuality is a construct that includes a separate sense of self while maintaining an interest and responsiveness to the other, freely sharing thoughts, feelings and experiences without manipulation, and with respect of growth in the self and other (Jordan, 1991). Lack of mutuality inhibits women from acknowledging and expressing anger. Women, according to Lerner (1985), fear alienating those with whom they have intimate relationships. They may suppress their anger to preserve harmony, due to separation anxiety and/or fear of abandonment. Women may suppress their anger out of fear of rejection by significant others, and as a result, leave wants and wishes unspoken (Thomas, 1997). Women may be socialized to avoid conflict and create a peaceful home at all costs. Arguments with spouses are more stressful to women than to men (Bolger, DeLongis, Kessler, & Schilling, 1989). If a woman's self esteem and identity are based on self-in-relation to others, intimate relationships are valued above the self, individual wishes and desires (Miller, 1991). Women may simply fear their anger as omnipotently destructive toward men and suppress it in order to maintain a relationship. However, it is likely that the suppression of anger creates a false relationship that is based solely on one member's happiness. The woman may experience depression as a result of the internalized negative affect.

Current literature. Only empirical research articles published in professional journals between 1991 and 1999 are included in this literature review.

Research Instrumentation

Research into emotional expression is often limited by the use of self-report measures. Studies into anger are faced with similar shortcomings.

Anger scales. One of the measures used was the State-Trait Anger Expression Inventory –Form HS (STAXI), developed by Spielberger (1988), to measure how extensively women suppress, express, or control their anger. Reliability ranged from .72 to .79 for anger-in (AX-In), .70 to .76 for anger-out (AX-Out), and .59 to .85 for anger-control (AX-Con) (Newman et al., 1999; Siegman et al., 1998; Sperberg & Stabb, 1998). Other scales developed by Spielberger et al. were used including the Anger-Expression Inventory (1985), State Anger Scale, (SAS), (1983), State-Trait Anger Scale (1980).

Several studies did not provide numbers for the reliability and validity of the Anger-Expression Inventory, STAXI or State-Trait Anger Scales, and instead simply stated that the scales were reliable and valid or reported the findings of the developers (Burns, 1995; Fischer et al., 1993; Kopper, 1993; Martin & Watson, 1997; Moreno, et al., 1994; Sperberg & Stabb, 1998; Vitaliano et al., 1993).

Goldstein's measure of anger felt at work and at home was employed by Thomas (1997) to measure anger frequency, intensity and expression at home and at work. The Anger Recall Interview (ARI), implemented by Anderson & Lawler (1995), determined need aroused (whether autonomy or affiliation needs) and anger expressed (suppression,

cognition, assertion or aggression). Inter-rater reliability was robust (r = .98) for Anderson & Lawler's study.

A self-created measure used by Faber & Burns (1996) used TAT stories and rated the degree of anger expressed through the content of the stories. Two raters coded the stories by counting the number of words connoting aggressive behavior and words reflecting anger or hostility. Interrater reliability was assessed using correlation coefficients ranging from r = .89 to r = 1.0 for aggressive behavior words and r = .67 to r = .98 for angry/hostile affect words.

Miscellaneous scales. Some studies provided a peer or spouse validation of anger expression as well as a self-report in order to increase validity of the self-report measures by means of a double criterion (Siegman et al., 1998). The Crowne-Marlowe Social Desirability Scale, developed by Crowne & Marlowe (1960), was used as a measure of social desirability in participants' pattern of responses (Malatesta-Magai et al., 1992). Rosenberg's (1965) Self-Esteem Scale (SES) was used as a measure of self-esteem. Bem's (1974) Bem Sex-Role Inventory (BSRI) was used to determine sex role classification (feminine, masculine, androgynous, and undifferentiated).

Mutuality scales. The Mutual Psychological Development Questionnaire (MPDQ) (Genero, Miller, & Surrey, 1990) measured mutuality in relationship. The instrument measures the woman's perceptions regarding mutuality in intimate relationships and contains both self and partner's perspectives as perceived by the respondent (Sperberg & Stabb, 1998). The MPDQ is both reliable and valid, with an inter-item reliability alpha coefficient of .92 and test-retest reliability alphas ranging from

.87 to .91 over a 2-week period. The MPDQ was correlated to other measures of social support (r = .44), relationship satisfaction (r = .72) and cohesion (r = .75) as reported by Genero, Miller, Surrey, and Baldwin (1992), which supports its construct validity.

Health measures. Systolic Blood Pressure (SBP), Diastolic Blood Pressure (DBP), and Heart Rate (HR) were measures commonly employed to monitor changes in cardiovascular activity. Devices used included the Cortronic Model 7000 blood pressure monitor (Burns, 1995; Faber & Burns, 1996); the Dinamap Adult/Pediatric Vital Signs Monitor Model 845XT (Vitaliano et al., 1993); Roche Arteriosonde monitor and EKG measures by a Grass Model 7 polygraph (Anderson & Lawler, 1995). Blood Pressure equipment was placed over the brachial artery on the nondominant arm of the subject in each study.

Sample Populations

The manner in which samples are chosen for research greatly affects the ability to generalize findings. Common sampling difficulties include the absence of control groups, small sample size, and sampling nonrepresentative populations. Most studies included an approximately equal number of men and women in each of the study groups or focused solely on women as participants. The most robust studies had comparable samples, matching for age, race, and SES.

Several studies were limited by an absence of control groups, which limited generalizibility (Anderson & Lawler, 1995; Fischer, et al., 1993; Kopper, 1993; Kopper & Epperson, 1991; Martin & Watson, 1997; Moreno et al., 1994; Newman et al., 1999; Siegman et al., 1998; Thomas, 1997). The remaining self-report and activity study

implemented control groups, which increase generalizability of findings (Burns, 1995). Three out of four of the emotion induction studies lacked control groups, thereby limiting generalizability (Faber & Burns, 1996; Malatesta-Magai et al., 1992; Nunn & Thomas, 1999). The one remaining emotion induction study used control groups (Vitaliano et al., 1993).

Researchers who used self-report measures only generally had more than adequate samples. However, Moreno et al. (1994) sampled only 69 participants. Studies implementing self-report and activities had small samples ranging from 49 to 58 (Anderson & Lawler, 1995; Martin & Watson, 1997). The small samples limit the generalizability of these studies' results to women in general. Larger samples ranging from 94 to 720 participants were employed by the remaining researchers (Burns, 1995; Fischer et al., 1993; Kopper, 1993; Kopper & Epperson, 1991; Newman et al., 1999; Siegman et al., 1998; Sperberg & Stabb, 1998; Thomas, 1997). Based on sample size, the results from these studies may be applied more reasonably to women in general. Larger samples, ranging from 63 to 160 participants, were used by the four researchers of emotion induction studies (Faber & Burns, 1996; Malatesta-Magai et al., 1992; Nunn & Thomas, 1999; Vitaliano et al., 1993). Again, the results from these studies can be applied more reasonably to women in general.

Researchers also seemed to favor the use of college student samples. Two of the four emotion induction studies (Faber & Burns, 1996; Nunn & Thomas, 1999), 6 of the 7 self-report studies (Fischer et al., 1993; Kopper, 1993; Kopper & Epperson, 1991; Moreno et al., 1994; Newman et al., 1999; Sperberg & Stabb, 1998) and 3 out of 4 self-

report and activity studies (Anderson & Lawler, 1995; Burns, 1995; Martin & Watson, 1997) used college samples. Whereas this is a population that is often used in research, the validity of applying the results to the general population has not been established. Interpretations of this data should be made with caution.

Procedures

For the most part, all of the studies had well-defined, standardized procedures; however, each study implemented procedures or measures in an individualistic fashion. In a majority of the studies, participants were randomly assigned to groups and given the self-report measures to complete. Second, heart rate and blood pressure apparatus were applied and baselines were taken after a rest period ranging from 3 to 15 minutes with heart rate taken continuously and blood pressure taken at specified intervals ranging from every 30 seconds to 2 minutes. Third, tasks were completed such as playing a videogame, attempting the Stroop color/word test or serial subtraction in a specified amount of time, while HR was taken continuously and BP was taken at regular intervals. Fourth, a rest period followed the activity. During some tasks, participants were encouraged to maximize their performance. Participants may have volunteered or earned money or course credit as an incentive.

However, several studies simply had participants complete demographic and inventory questionnaires without measuring HR or BP (Fischer, et al., 1993; Kopper, 1993; Kopper & Epperson, 1991; Moreno, et al., 1994; Newman et al., 1999; Sperberg & Stabb, 1998). The specific procedures of each study will be discussed in the research literature section.

Research Literature

Empirical studies evaluating women's anger expression style and health and relational consequences can be placed into three basic categories: (a) studies using standardized, structured inventories and questionnaires to assess anger expression, mutuality in relationships, and social desirability; (b) studies using standardized, structured interviews and questionnaires, while implementing activities for participants to complete in order to evaluate health, stress or emotional reactions; and (c) studies that implement emotion induction as well as standardized, structured interviews and questionnaires. The literature in each of these categories will be reviewed.

Inventory and Questionnaire Findings

Fischer et al., (1993) designed a study to determine sex differences on affective dimensions, given that previous research provided inconsistent results. It was hypothesized that sex role socialization makes women more vulnerable to depression, anxiety, and repressed anger than men. This hypothesis would be supported by findings from self-report measures. Anger as a trait would be higher for women, due to socialization to repress anger and direct it toward self. Self-report measures would reflect increased depression and internalization of anger for women.

455 college students (282 females and 172 males) were included in the sample. A demographic questionnaire was completed along with the State-Trait Anger Expression Inventory (STAXI), the State-Trait Anxiety Inventory (STAI) and the Beck Depression Inventory (BDI). Inventories were administered in a randomly determined order. Only

428 participant's data were used in analysis. Since there were only two groups, the single discriminant function was found to be statistically significant ($p < .001$). The discriminant function shared 7.3% common variance with sex, which although small, was statistically significant. Men were found to be higher on Trait-Anger Temperament and on Anger-Out. Otherwise minimal sex differences existed in the expression of affect. Women and men had similar scores for Anger-Control and Anger-In, measures that define the repression of anger. Women did not score higher than men for depression. The results of this study may reflect the changing societal norms, which allow women to "get in touch with" and express their anger (Fischer, et al., 1993). A new generation of women may not experience a societal pull for the repression of anger, which could lead to internalized anger and depression. Consequently, stereotypic treatment of women's affective issues may actually be destructive (Fischer, et al., 1993). Women as a group deserve individualized treatment.

Limitations of the study need to be considered. Due to the use of college students, the sample is restricted in use for generalizability. The study could be replicated with other samples. Since the alpha level was distributed evenly to protect against inflated Type I error, the statistics were conservative and had reduced power. The instruments used had limitations of reliability and validity on research.

Kopper (1993) investigated the relationship of gender, sex role identity (whether one perceives oneself as feminine, masculine, androgynous or undifferentiated), and Type A behavior (a behavioral pattern of hard-driven competitiveness, time urgency, hostility and anger) in Anger expression and mental health functioning. It was

hypothesized that consistent relationships would be found between sex role identity and anger expression, without significant gender differences. Type A behavior patterns would be significantly related to anger expression. Finally, gender, sex role identity, and behavioral patterns would be related to mental health functioning.

Participants included 629 undergraduate students (407 women and 222 men), of which 620 completed full data inventories. Ages ranged from 17 to 48 years but, 95% were under the age of 25. Each participant completed a demographic questionnaire and the Trait-Anger Scale, Anger Expression Scale (AX), BDI, BSRI and several other measures for hostility, assertive and aggressive behaviors, and a version of a Type A inventory for college students. Participants completed the questionnaires in varying orders to control for the effects of instrument order.

Results of the study indicated that sex role identity and behavior pattern type produced meaningful differences in subject's responses to anger ($\underline{F}$ [12, 1446] = 6.63, $\underline{p}$ < .0001 and $\underline{F}$ [4, 480] = 3.96, $\underline{p}$ < .0038). Again, gender was found not to have an effect (Kopper, 1993).

ANOVA results for trait anger indicated a significant effect for sex role identity, $\underline{F}$ (3, 483) = 4.03, $\underline{p}$ < .0076, and behavior pattern type $\underline{F}$ (1, 483) = 9.04, $\underline{p}$ < .0028. Participants with a masculine sex role type were significantly different from participants with an androgynous sex role identity, and they displayed a higher level of trait anger. Type A individuals displayed a higher level of trait anger than did Type B participants (Kopper, 1993).

ANOVA results for anger-out indicated a significant effect for sex role identity, F (3, 483) = 8.45, $p < .0001$. Participants with a feminine sex role were significantly different, as they scored lowest on the Anger-Out scale, suggesting the lowest tendency toward expressing anger outwardly toward other people or objects in the environment. Participants with a masculine sex role identity received the highest scores, indicating a greater tendency to express anger outwardly (Kopper, 1993).

ANOVA results for anger-in indicated a significant effect for sex role identity, F (3, 483) = 10.41, $p < .0001$, and behavior pattern type, F (1, 483) = 11.78, $p < .0007$. Feminine sex role types indicate the greatest tendency to hold in or suppress anger. Androgynous sex role types received the lowest scores in anger suppression and were significantly different from feminine sex role types. Type A individuals indicated a greater tendency to hold in or suppress anger and were significantly different from Type B individuals (Kopper, 1993).

ANOVA results for anger control also revealed a significant effect for sex role identity, F (3, 483) = 6.88, $p < .0002$. Persons with a feminine sex role identity reported a significantly greater tendency to control anger and were significantly different from participants with a masculine or undifferentiated sex role identities. The lowest scores were obtained by individuals with an undifferentiated sex role identity (Kopper, 1993).

Participants with a feminine sex role identity obtained the highest scores in guilt, conflict avoidance, dependency, and depression, all mental health variables. Gender seemed to be important in relation to other mental health variables, such as indirect

hostility, irritability, and dependency for women and assault and aggressiveness for men (Kopper, 1993).

Of note in this study's findings was the significant association between sex role identity and anger expression. Feminine sex role types were least likely to express anger outwardly and most likely to suppress anger and to attempt to control the expression of anger. The Type A behavior pattern was significantly associated with anger proneness and anger suppression. Type A individuals with a feminine sex role identity indicated a higher proneness to anger as a personality trait.

Limitations of the study included the use of a college sample and the use of self-report measures. Further research on anger expression, Type A behaviors, and sex role identification needs to be done to repeat the results obtained in this study. Expanding the sample population beyond college and replicating results would also increase generalizability. Kopper (1993) also concluded that response bias might have been eliminated due to ensured subject confidentiality and anonymity and the elimination of data with invalid profiles.

Kopper and Epperson (1991) conducted a study to investigate sex and sex role comparisons in the expression of anger. It was hypothesized that women have more difficulty than men do in recognizing and expressing their anger. Sex-related and sex role identity differences regarding anger proneness as a personality trait, the tendency to express anger toward other people or objects in the environment, anger suppression, and the tendency to control the experience of anger were explored.

Participants included 455 undergraduate students (242 females and 213 males). Participants, in groups of 25, completed a demographic questionnaire, Trait Anger Scale, Anger Expression Scale and Bem Sex –Role Inventory – Short Form.

ANOVA results for Trait-Anger (anger proneness) and AX/Out (anger directed outward) revealed one main effect for sex-role identity, F (3, 399) = 3.83, $p < .01$ and F (3, 399) = 6.64, $p < .001$. Masculine sex role types expressed higher levels of trait anger than feminine, undifferentiated and androgynous sex role types. Masculine sex role types also scored highest on the AX/Out scale. However, on the AX/In scale a single main effect for sex role identity was revealed, F (3, 399) = 3.88, $p < .01$. Feminine and undifferentiated sex role types were associated with a greater tendency to suppress anger than androgynous types. Masculine sex role types did not differ from any other types. Anger control scores were used as the dependent variable to address sex and sex role differences in the tendency to control the experience and expression of anger. One main effect for sex role identity was found, F (3, 399) = 7.16, $p < .001$. Androgynous and feminine sex role types reported a greater tendency to control anger than did masculine types. Androgynous sex role types also controlled anger more than undifferentiated types (Kopper & Epperson, 1991).

Sex was not a determining factor in anger expression or the tendency to suppress anger. However, sex role identity was significantly associated with anger proneness, expression of anger toward other people or objects in the environment, suppression of anger, and control of anger expression. Masculine sex role types were more prone to anger, more likely to express anger outwardly, and less likely to modulate the expression

of anger. Feminine sex role types and undifferentiated types were least likely to express anger outwardly. Feminine and androgynous sex role types were most likely to control the expression of anger. Feminine, undifferentiated, and masculine sex role types did not differ in the suppression of anger (Kopper & Epperson, 1991). Of interest is the fact that these findings were based on a sample of young, well-educated men and women who may have experienced a different pattern of socialization, which may have allowed more freedom of expression of anger (Kopper & Epperson, 1991). Further research should continue to focus on this topic.

Limitations of the study include the population studied and the use of self-report measures. The lack of definition for each sex role identity seriously limited the results of the study. The findings lack power when terms are not defined. The findings of the study need to be replicated on other sample populations, excluding college populations, as a means of increasing generalizability. Self- report measures are limited in reliability and validity. Kopper and Epperson (1991) state that the response bias was limited by assuring confidentiality and anonymity to participants and by the inclusion of validity scales.

Moreno et al., (1994) conducted a study to clarify the understanding of the relationship between depression and hostility. Specifically, the study examined whether hostility covaries with severity of depression and whether certain types of hostility covary with severity of depression more than others. For the purpose of this review, the affective component of hostility, anger, will be explored rather than the behavioral or cognitive components of hostility.

Moreno et al., (1994) used a clinical sample of 69 participants (39 men and 30 women) from a variety of clinics including Inpatient Psychiatry, a Depression clinic, and counseling, learning, and career centers at the University of Utah and the University of California, Santa Barbara. A strength of this study was the use of a clinical sample with the exclusion of chemically dependent, psychotic and organically impaired persons.

Participants completed the Hamilton Rating Scale for Depression, the Buss-Durkee Hostility Inventory, the State-Trait Anger Scale and the Hostility and Direction of Hostility Questionnaire. The State-Trait Anger Scale was used to measure the affective component of hostility. Another strength of this study was the second assessment of 20 randomly assigned participants, who completed the hostility and depression scales 7 to 10 days after initial testing. This second assessment was done to check the stability of depression ratings over time (Moreno, et al., 1994).

Results of the study found that significant positive correlations were found between severity of depression and all measures of anger and hostility using Pearson product-moment correlation coefficients of the Hamilton Rating Scale for Depression and hostility and demographic variables (Spielberger State Anger $r = .44$ and Spielberger Trait Anger $r = .40$, $p < .001$). Another finding of the study determined a general tendency for females to achieve higher scores when sex was correlated with hostility measures. Trait anger was positively and significantly associated with female gender ($r = .30$, $p < .05$).

Overall, the present findings of this study offered strong support for the association between depression and multiple types of hostility, including the affective

type, anger, although the results of the study were contrary to previous study findings, where either no relationship or an inverse relationship was found between hostility and depression. One explanation offered by Moreno et al., (1994) for the findings was the use of a clinical sample, which may have a tendency to report higher levels of depression and overt hostility. However, the significant correlation between anger and depression was consistent with previous findings (e.g., Biaggio, 1987). The findings suggest that an association may exist between severity of depression and a tendency not to monitor or control angry feelings.

Several factors were proposed by Moreno et al., (1994) to account for the tendency of women to score higher on scales measuring Trait Anger. The measure of hostility may be more explicit and exact. Another factor was the impact of the changing role definitions and behavioral expectations of women in society. Finally, the authors proposed that the effects of longstanding social, political, and economic inequalities between males and females in American society might account for women's higher scores of Trait-Anger. Environmental factors such as social change and family structure change may influence women's anger experience and expression in ways that increase anger beyond traditional expectations.

The limitations of the study include the use of a clinical sample, which limits generalizability of the findings to women in general. The small sample size also limits the generalizability. The use of self-report measures incurs questions of reliability and validity. The measures used were not counterbalanced to control for instrument sequence effects, nor were efforts made to control for response bias.

Newman et al., (1999) conducted a study to determine the effects of sex, anger, and depression. The study was designed to answer several questions. First, it was hypothesized that there were significantly different mean levels of anger and depression for men and women. Second, hypothesis proposed that a linear combination of anger scales would be significantly related to depression for men and women as separate groups. Third, hypothesis proposed that there were differences in the strength of the relationship between anger and depression scales for men and women. A final hypothesis looked at the possibility of a correlation between internalized anger and state and trait anger for women and men.

Participants included 226 women and 169 men, all undergraduate college students. Participants were given the State-Trait Anger Expression Inventory, Beck Depression Inventory, and a brief demographic questionnaire in groups of 50 to 100.

Results of the study began with a rejection of the null hypothesis (F exact [7, 387] $= 2.38$, $p < .05$). Univariate t tests were administered and results were examined. Mean depression scores for women were higher than for men (Newman et al., 1999). This finding was consistent with other research suggesting that women are more depressed as a group than men as a group (McGrath, Keita, Strickland, & Russo, 1990). No significant difference was found for men and women on any of the six anger scales from the STAXI. For both men and women, there was a statistically significant relationship between the linear combination of the anger scales and depression after a forward multiple regression analysis. Anger-In (R increment = .27), State Anger scales (R increment = .09), and Trait Anger-Temperament (R increment = .02) accounted for

significant correlation of depression scores for women. The Anger-In scale and depression shared 27% of the variance for women. Internalized anger plays a more prominent role in depression among women. Women may be more likely to convert internalized anger into depressive symptoms than men (Newman et al., 1999). The Anger-in scale had a statistically significant correlation with four of the five anger scales for women. Perceived internalization of anger is related to both state and trait anger for women but not for men. Newman et al. (1999) proposed that women may perceive fewer choices in anger expression, which may lead to state and trait anger becoming internalized.

Limitations of the study by Newman et al. (1999) include the use of correlational results, which do not address the causative models that may account for relationships between variables. Men and women represent heterogeneous groups; therefore, studying between-group differences will not provide satisfying results. Reliance on self-report measures limits reliability and validity. Peer and significant other reports in conjunction with self-reports would counter the difficulty. Response bias and the inventory sequence effect may have influenced results. Expanding the results found in this study by implementing studies with different behavioral and arousal response options would be useful. The use of a college sample limits generalizability. Replications with other samples should increase the reliability and validity of the findings.

Sperberg and Stabb (1998) conducted a study to investigate the relationships among anger, depression, and women's emotional expressivity within the context of their partner relationship. Sperberg and Stabb (1998) hypothesized that lower levels of

mutuality and higher levels of suppressed or inappropriately expressed anger would be associated with depression. High mutuality would be associated with less depression. High anger-out would be associated with more depression.

A sample of 234 female undergraduate and graduate students volunteered to participate in the study. A demographic questionnaire, BDI, STAXI, the Mutual Psychological Development Questionnaire (MPDQ), and a return envelope were included in the packet for each participant. The order of testing instruments was counterbalanced to control for instrument sequence effects. Packets were completed outside of class and were returned during a follow-up visit.

Results of the study by Sperberg and Stabb (1998) were groundbreaking in that the impact of relationship status and health were found to be associated with anger expression and depression. The relationships among mutuality, anger-in, anger-out, anger-control, demographic variables, and depression were assessed using a Pearson correlation matrix. Mutuality was moderately negatively correlated with anger-in, r (223)= -.38, $p < .01$, which may reflect that anger suppression was associated with relationships that are lower in mutuality. Mutuality was unrelated to anger-out but slightly and positively related to anger-control, r (223) = .16, $p < .05$. Sperberg and Stabb (1998) also found a small, but significant, positive relationship between suppressed anger and anger-out, r (223) = .17, $p < .05$. Anger-control was inversely related to both anger-in, r (223) = -.25, $p < .01$, and anger-out, r (223) = -.56, $p < .01$.

Anger-in and mutuality were moderately and significantly correlated with depression (r = .52 and r = -.44, respectively; both ps < .01, n = 223). Greater anger

suppression and lower mutuality were associated with higher depression scores. Anger-out was positively correlated with depression (r [223] = .23, $p < .01$), and anger-control was inversely related to depression (r [223] = -.28, $p < .01$). Sperberg and Stabb (1998) proposed that aggressively expressed anger was related to greater depression whereas cognitive and behavioral control of anger may decrease depression.

The correlational matrix supported the hypothesized directional relationship between mutuality, anger-in, anger-out, and depression. Age and time in relationship were entered to control for their effects on depression, as they had been found to correlate with depression (r = -.19, $p < .01$ and r = -.16, $p < .05$, respectively; both ns = 223). The two demographic variables accounted for 4% of the variance in depression scores. Twenty four percent of the variance was predicted by anger suppression. An additional 2% of the variance was explained by uncontrolled anger expression. Another 9% was explained by mutuality. Higher scores on anger suppression and aggressively expressed anger as well as lower scores on mutuality contributed significantly to the prediction of depression.

In the same study, Sperberg and Stabb (1998) examined the relationship between depression and high/low levels of mutuality and suppressed anger. A 2 x 2 factorial ANOVA on the BDI scores was implemented. Anger-in and MPDQ scores were dichotomized into high and low levels, providing a minimum of 30 participants per cell, which increased the power of the results. A test ANCOVA, completed using the covariates, produced results similar to the results of the ANOVA. Therefore, the researchers presented only the ANOVA results. A sequential adjustment was made to

correct for nonorthogonality. The main effect for anger-in was significant, F (1, 219) = 37.53, $p < .001$. The main effect for mutuality was also significant, F (1, 219) = 24.74, $p < .001$. Women in the high anger suppression category and women in relationships characterized by low mutuality reported higher depression. There was no interaction effect.

Sperberg and Stabb (1998) also examined the relationships between depression and high/low levels of mutuality and uncontrolled expressed anger using a 2 x 2 ANOVA on the BDI scores. Again, anger-out was dichotomized; ANCOVA was completed; covariates were eliminated; and sequential adjustment was made to correct for nonorthogonality. The main effect for anger-out was significant, F (1, 219) = 6.72, p = .01 as was the main effect for mutuality, F (1, 219) = 33.31, $p < .001$. Women in the high anger-out category and women in relationships characterized by low mutuality reported more depression. Again, there was no significant interaction effect.

The findings of this study by Sperberg and Stabb (1998) support the construct of mutuality as it relates to women's depression and anger. Women with the lowest depression scores had highly mutual relationships. In highly mutual relationships, the authors proposed that anger is not suppressed, but rather it produces productive action. High mutuality predicted lower depression scores better than the construct of anger-in. Mutuality was related to anger-control. Depression was related to anger-in, anger-out, and anger-control. All three anger constructs were related and not mutually exclusive.

Limitations of the study include the correlational nature of the study, which does not allow for cause and effect conclusions. Another limitation is the use of a college

sample, which limits generalizability. Women of varying socioeconomic, racial, and sexual orientation groups should be studied in relation to this topic. Further research on anger using Spielberger's scale would provide necessary continuity between studies. The inclusion of peer and spouse/partner responses to self-report measures could increase the reliability and validity of the findings.

Thomas (1997) conducted a study to examine the relationship of anger frequency, intensity, and suppression to blood pressure. A second aim of the study was to determine if differences in anger frequency, intensity, and suppression between groups of women with selected demographic characteristics (age, family history of hypertension, and marital status) were significant.

Of particular concern for Thomas (1997) was the issue of gender. According to Thomas, gender impacts emotional display since the rules of emotional display are learned within the constraints of gender role socialization. Suppression of anger may be more likely in women due to the fact that suppression is consistent with gender role socialization of women, with an emphasis on pleasing others and preserving harmony in relationships. Anger behavior is first learned in the family of origin, and girls are likely to be taught to be more emotional as long as they are nonaggressive (Block, 1973). Parents may unknowingly create vulnerability to hypertensive disease by discouraging their daughters from expressing their anger. Other family influences on anger habits include marital conflict between parents, conflict between siblings, and other family processes (Ewart, 1991).

Participants included 210 females, of which 54% were university students, and 46% were faculty or staff of the university. Each participant completed a questionnaire on anger frequency, intensity, and expression, rating both home and work. Blood pressure, height, and weight were also measured, and a body mass index was calculated (weight in kilograms divided by height in meters squared). A health check questionnaire, which included demographic characteristics, health behaviors, and family history of hypertension, was also given to participants to complete. A participant's level of weekly exercise (a control variable) was assessed by ranking her level of weekly exercise activity according to a predetermined scale.

Analysis of covariance (ANCOVA) was used to examine the relationship of anger variables to systolic (SBP) and diastolic (DBP) blood pressure. There was no main effect for any of the anger frequency or intensity variables for either SBP or DBP. Suppressed anger, however, was related to both SBP and DBP. Low scorers on anger expression (i.e., suppressors) had significantly higher SBP than nonsuppressors (F [5, 72] = 10.89, $p < .0001$). Anger suppressors had higher DBP as well (F [5, 72] = 8.67, $p < .0001$). Low scorers on Anger Expressed at Home had significantly higher SBP (F [5,91] = 11.82, $p < .0001$) and DBP (F [5, 91] = 9.38, $p < .0001$). Suppression of anger at work did not have a significant impact on BP. There was no main effect for Anger Expressed at Work for either SBP or DBP. There were no significant differences between married and unmarried women on any of the 11 anger variables. Women with and without family history of hypertension did not differ in the propensity to express anger or in the amount of anger expressed in their family of origin. Younger women reported higher Family-

Expressed Anger (t [86, 103] = -2.52, p = .01) and higher self-expressed anger (t [86, 102] = -2.12, p = .04) than did older women.

Relationships among the anger variables were examined using Pearson's correlation coefficient. Anger experienced at work (WORKTOTAL) was moderately correlated (r = .45) with anger experienced at home (HOMETOTAL). Experienced anger was not strongly related to expressed anger, which Thomas (1997) proposed was consistent with previous findings demonstrating that much of women's anger is suppressed. Also of note, there was little association between felt anger and expressed anger in the home (r = .14). Having grown up in a family that often-showed anger (Family Expressed Anger) was positively correlated with women's current propensity to express their anger in the workplace (r = .27) and in the home to a spouse or best friend (r = .37).

It is not known whether anger suppression may have to co-occur with family history of hypertension, chronic stress, or other contributing factors to produce hypertension (Suls, Wan, & Costa, 1995). Add overeating, smoking, drinking, and drugs as means of self-medicating against the discomfort of suppressed anger, and it is likely that anger makes an indirect and unrecognized contribution to many cases of hypertensive disease (Thomas, 1997).

Limitations of the study include the use of the Goldstein measure, which only measures anger experienced at home and work. More research in this review used the Spielberger measure of anger, which had greater reliability and validity. Further research needs to be done in other contexts and situations. The cause of the anger was not

explored. The majority of the sample was white and educated. Further research using other sample populations would increase the generalizability of the findings to women in general. Again, use of self-report measures did not control for response bias and the instrument sequence effect.

Inventory and Activity Findings

The second type of study added activities to evaluate a health, stress, or emotional reaction, while continuing to measure anger expression in self-report inventories and questionnaires. Several studies added mental or physical activities and measured cardiovascular reactivity or cardiovascular reactivity under stress. One study examined the construct validity of the Anger Expression Scale. All studies were interested in the anger experience and associated behavioral and health patterns.

Anderson and Lawler (1995) conducted a study to evaluate the affective experience of hostility and to relate qualities of that experience with cardiovascular reactivity, which was one potential mechanism of cardiovascular risk. Anderson and Lawler (1995) hypothesized that an Anger Recall Interview (ARI) could assist in the exploration of Type A behavior patterns (TABP) and cardiovascular reactivity. Specifically, the ARI would be used to understand the experience of anger for Types A and B women. Interviews were coded for need aroused by the anger incident and mode of expressing anger. The authors proposed that need aroused and mode of expression in a recalled anger incident would be differentially related to TABP and cardiovascular reactivity.

Participants included 58 college females. Participants were connected to monitoring equipment, and a 15-minute baseline was recorded for HR and BP. The Stroop color-word test, a 3-minute timed task, was administered by the examiner using a visible stopwatch and verbal instructions to increase the pace and accuracy of responding. A 5-minute rest period was followed by the ARI, a semi-structured interview, with each subject being asked questions in order to have a minimum of 4 minutes of speech. The interview addressed the experiential and expressive aspects of anger. BP and HR were recorded. Another 5-minute rest period was followed by a structured interview for Type A assessment, which was completed without physical monitoring equipment. Participants were then asked to complete a packet of questionnaires

A brief word about the ARI is in order. Interviews were coded for need aroused and anger expressed. Need aroused was defined as an organizing of perceptions, cognitions, and behaviors in an effort to alter circumstances that provoked anger. Autonomy needs (Aut) were related to a striving for independence and self-determination. Anger may have been experienced because women felt restraint, a lack of independence or externally inhibited self-determination. Affiliation needs (Aff) were related to relatedness and connection to others. Self-esteem needs (SE) were related to self-image, presentation to others, and their reception to that image. Anger expressed could be categorized in one of four ways: suppression, cognition, assertion, and aggression. Suppression was coded when participants neither took action nor discussed the issue with others. Cognition was coded when participants discussed the angering event with others who were uninvolved, wrote about the event, or ruminated without

taking action. Assertive expression involved direct confrontation with the involved party to resolve the conflict. Aggression included verbal and physical acts of overt hostility. One of the strengths of this study was the inter-rater reliability of this measure ($r = .98$, $p < 0.0001$).

The study found that 50% of Type A women reported anger over incidents threatening their self-esteem, whereas almost 50% of Type B women reported anger over threats to affiliation. There was a significant Type x Need interaction (F [2, 51] = 3.1, $p < .05$) for systolic blood pressure (SBP). Type As who reported anger related to the frustration of Aut needs exhibited higher levels (F [1,51]= 6.5, $p < .01$) than Type As with other needs. A Type main effect (F [1,51] = 6.0, $p < .02$) was found with Type A women exhibiting higher DBP responses than Type Bs. The authors inferred that Type A women were more reactive than Type B in response to talking about an anger experience. Type As achieved a higher HR in response to self-esteem needs than affiliation needs. Type Bs achieved a higher HR with self-esteem needs than with Aut or Aff needs.

Type As expressed anger in all four categories but expressed outward aggression the most and suppression the least. There were no significant main effects or interactions for SBP. Those who reported suppressing anger responses had higher levels of SBP than those who assertively expressed anger. As for DBP, it remained elevated throughout the interview unless participants expressed anger assertively (F [1,10] = 13.7, $p < .004$). Type As also decreased HR across the interview less than Type Bs.

The results of the study support the differences in anger experiences of women. Over half of the Type A women described an anger incident involving a threat to self-

esteem, which coincides with the conceptualization of Type A behavior as a coping response in reaction to status-insecurity. HR was also the highest when the need determined by the ARI coding was self-esteem. Type As also revealed anger over autonomy needs. Type As had greater SBP reactivity in association with needs for autonomy. Anger suppression and overt expression were associated with higher SBP. The highest SBP was associated with Type A women who suppressed their anger and the lowest SBP was associated with Type B women who resolved their anger assertively. Anderson and Lawler (1995) suggest that Type A women who experience anger regularly but fail to address their concerns assertively, which may be due to a hostile view of others, may experience the greatest amount of cardiovascular arousal.

Limitations of the study include the problem of a college sample, which limits generalizability. A second limitation was the use of the ARI. Although the inter-rater reliability for this study was sound, the Anger Recall Interview was not widely used or accepted as a robust measure. Further replications using the ARI are needed.

Burns (1995) also conducted a study examining the interactive effects of traits, states, and gender on cardiovascular reactivity during situations of social evaluation, harassment, or a control condition (without overt manipulation). Burns proposed that measures of anger-hostility would predict cardiovascular reactivity (CVR) among participants in the harassment condition. However, links between traits and CVR might be moderated by other traits or affect states, which might explain the inconsistencies in the research findings. Burns (1995) hypothesized that participants characterized by traits of anger-hostility and anxiety who experienced negative affect arousal from the

experimental situation would display greater CVR than participants who did experience negative affect arousal in the experimental situation.

Burns (1995) gathered a sample of 183 college participants (91 men and 92 women). A strength of the study included the attempt to control for extraneous variables. Participants were instructed not to consume caffeine 6 hours prior to the experiment, as a means of controlling an extraneous variable (caffeine) that would alter HR and BP. Participants received the questionnaire packets, including the Anger Expression Inventory and State-Trait Anger Scale and measures for anxiety and fear of negative evaluation, in a counterbalanced order. The counterbalanced order of measures limited the inventory sequence effect.

Participants completed a two-alternative, forced choice reaction time task. A correct response required hitting a correct bar within a time limit, which was altered for each trial and was equal to the mean response time of the last three trials. Thirty trials were completed in 5 minutes. Participants were randomly assigned to social evaluation, harassment, or control conditions. The control group completed the reaction task alone and without interruption. The harassment group completed the reaction task while an experimenter delivered eight harassing comments (e.g., "Concentrate more and go faster") between predetermined trials of the reaction task. The social evaluation group completed the reaction task while being observed by a silent confederate. The subject had been told that the experimenter would be studying the subject's "decision-making abilities."

Blood pressure (BP) and heart rate (HR) were measured during a 5-minute baseline, after which an affect adjective checklist was completed. The reaction time task followed. After completing the task, participants completed another affect adjective checklist. Monitoring equipment was removed and participants were asked to complete questionnaires as part of an "optional mass-testing session," which the experimenter portrayed as unrelated to the stress task procedure.

Baseline cardiovascular functioning using ANOVAs showed men to have higher SBP and DBP, and women had higher HR. Participants in the three conditions did not differ significantly on baseline values. ANOVAs were conducted to determine whether performance of the reaction time task produced significant cardiovascular changes from the baseline measures. Task values were defined as the mean of SBP, DBP and HR values obtained during the 5-minute reaction time task. Condition and gender represented the between subject factors and baseline to reaction time represented the within-participants factor. For SBP, a significant baseline to reaction time effect (F [1, 177] = 182.62, $p < .0001$) was qualified by a significant gender x baseline to reaction time interaction (F [1, 177] = 5.07, $p < .03$). Simple effects analyses demonstrated that both men and women exhibited significant SBP increases. All groups exhibited significant mean elevations of SBP, DBP and HR during the reaction time task regardless of gender or condition (Burns, 1995).

ANOVAs were performed to determine whether groups reported increased negative affect from the baseline to reaction time task. Burns (1995) found that the only effect was for the within-participants factor, baseline to reaction time (F [1, 177] =

132.60, $p < .0001$). This finding indicated that significant increases were reported, but that participants in the manipulation groups did not show greater negative affect than participants in the control condition.

Hierarchical multiple regressions were employed to determine the complex interactive effects among psychological traits, affective states, task conditions, and gender on SBP, DBP, and HR change scores. A residualized change score was derived by regressing self-reported negative affect during the task on baseline levels. The negative affect change score (NACH) was used as a main effect factor. The anger expression measure was also consolidated (AE) so that participants who predominantly suppress anger would have negative AE scores and those who express their anger would have positive AE scores. There were no significant sex differences or differences between conditions for any of the self-report variables. Women's responses to each of the conditions were not significantly related to CVR.

Men and women did demonstrate interactions for AE x NACH. Anger suppressors who reported little negative affect arousal and anger expressers who reported much NACH showed the largest pressor responses to the Social Evaluation condition. The SBP of anger suppressors with high NACH was greatly affected by the Harassment condition. Burns (1995) proposed that state affective responses might interact with anger expression traits to affect CVR and that anger suppression appears to play at least as large a role as anger expression.

Burns (1995) determined that anger expression style interacts with anger experience and the stress situations to affect CVR only among men. Anger-prone women

may not have exhibited significant CVR even during harassment conditions unless they were also engrossed sufficiently to register negative affect alterations. Women might not have engaged in the competitive task as much as men did. Women's physiological reactivity might be influenced by subjective appraisals as well as objective qualities of a stress situation. When state negative affect during stress was considered in conjunction with the stress situations, anger expression style was related to CVR among both men and women. Anger suppression and anger expression may be related to stress-induced CVR, although modified by chronic feelings of anger, negative affect states, and the nature of the stressor.

A significant finding of the study determined that extreme suppression and expressed anger-hostility produced similar consequences for health and should be synthesized into a comprehensive model of anger as a maladaptive psychological risk factor for cardiovascular disorder. General psychological traits, such as anger-hostility and anxiety, appear to contribute to coronary risk via complex, interactive associations with other traits, gender, and the environment.

Limitations of the study again focus on the use of a college student population, which limits the generalizability of the findings. Replicating this study using other populations would increase generalizability of the results. The study reported its findings in a manner that was difficult to follow, and seemed at points to contradict itself.

Martin and Watson (1997) conducted a study to explore the construct validity of the Anger Expression Scale in a diary study of daily events of college women. The study explored the relationship between style of anger expression, daily state levels of negative

affect, and neuroticism. Three other types of daily events were also considered: current mood, problem frequency, and frequency of positive events. It was expected that high anger-in scorers would report greater levels of daily negative affect than low anger-in scorers. Anger-in was also expected to be associated with the frequency of reported problems but not the occurrence of positive events. The researchers also expected that Anger-in and Anger-out would be positively associated with neuroticism.

Forty-nine women were recruited to become the final sample. Forty-two received nominal monetary compensation and the other nine received course credit for their participation. Ninety six percent of the sample group was Caucasian with participants ranging in age from 18 to 22 years. Participants completed the Anger expression scale and the NEO-PI, which measured neuroticism. Participants also completed seven diary entries for 8 consecutive days at 8:30 a.m., 11:00 a.m., 1:30 p.m., 4:00 p.m., 6:30 p.m., 9 p.m., and bedtime. Each entry included information about current mood and problematic or anger-eliciting events. The Positive and Negative Affect Schedule (PANAS; Watson, Clark, & Tellegen, 1988) was used to assess mood. The first entry of the day was based on the occurrence of events since waking and subsequent entries were based on events since the preceding entry. A strength of the study included the use of a narrative style entry about whether their day had been atypical (i.e., participants did not become ill or experience extreme or catastrophic life events) during the course of the diary-recording period. This simple addition to the diary attempted to control for extraneous variables that could potentially skew results.

Results of the study by Martin and Watson (1997) are as follows. A zero-order correlation was completed. Anger-in and Anger-out were nonsignificantly related; therefore, they measure different dimensions. Although the researchers expected that Anger-out would be related to neuroticism, only Anger-in was found to be significantly related. Anger-out was unrelated to all other variables, a fact that challenges the construct validity of the Anger-out scale. Daily negative affect, problem frequency, and anger frequency were all strongly interrelated, with correlations ranging from .50 to .71. Participants who reported high levels of negative affect also tended to report more frequent problems and anger experiences. Daily positive affect correlated significantly (r = .30) with the frequency of positive events. Anger-in had a significantly stronger correlation with general negative affect (r = .58) than with anger frequency (r = .30; z = 2.30, $p \leq .05$, two-tailed). Anger-in was the best predictor of nonspecific negative affect, whereas neuroticism had the highest correlation with anger frequency.

In the analyses of specific negative affects, Martin and Watson (1997) reported that neither anger-in nor anger frequency demonstrated any specific differential relation with anger experience. Anger-in was substantially correlated with daily anger (r = .51); it showed very comparable associations with fear (r = .55), general distress (r = .54), and anxiety (r = .45). Anger frequency correlated as strongly with general distress (r = .54) as with anger per se (r = .49). Anger-in tended to correlate more strongly with the various types of negative mood than with neuroticism.

The relationship of anger-in to neuroticism facets of Hostility, Anxiety,

Depression, Self-Consciousness, Impulsiveness, and Vulnerability was explored. Martin and Watson (1997) found that Anger-in was not strongly correlated with the hostility facet scale (r = .22). Anger-in did, however, significantly relate to Anxiety (r = .39), Depression (r = .33), and Self-Consciousness (r = .33) facet scales. Anger-out was not significantly correlated with any of the neuroticism facets.

Hierarchical regression analyses were conducted to determine amount of variance for neuroticism and anger-in and the diary variables. Anger-in was found to contribute substantially to the prediction of both daily negative affect (contributing an added 22% of the variance) and problem frequency (an additional 13%). However, when neuroticism was entered into the regression equation, anger-in scores failed to contribute significantly to the prediction of anger frequency. Again, the findings question the specificity of anger-in as a measure of anger experience.

The findings of Martin and Watson (1997) were considerable. The level of anger-in was substantially associated with unpleasant daily experiences. Participants with high anger-in scores reported greater negative affect than did those with low scores. Anger-in was positively correlated with the frequency of daily problems. Anger-out was not significantly associated with anger frequency, problem occurrence, negative affect, and anger expression. Participants indicated that anger was expressed 45% of the time, a fact that suggests that anger expression occurred with enough frequency and variability to detect a significant relation between anger-out scores and expressive behavior. However, anger-out items focused on extreme types of expression, and it is possible that the aggressive behaviors tapped by the anger-out scale were less relevant to women

participants than they would have been to men. Previous studies have documented lower levels of verbal and physical aggression among women than men (Buss and Perry, 1992). However, the trait of anger was found to be relevant across genders (Martin and Watson, 1997).

The limitations of the study by Martin and Watson (1997) were four-fold. The use of self-report measures limited the findings, as participants might have been reluctant to admit their angry feelings and behaviors. Observer ratings might have provided additional information. However, assessment by informants incurs its own problems. Highly hostile participants would likely have refused to participate, thereby providing a biased sample. Subjective experiences of problems and anger were not directly observable. Observer ratings might have been better suited to the assessment of general tendencies rather than daily experiences. Finally, diary-recording methodologies required considerable time and effort, and that time and effort would only be compounded by the use of observers.

Second, late entries, within 24 hours of the entry time, accounted for 23% of the diary entries completed. The impact of memory and perception could confound the effects of the study. Martin and Watson (1997) attempted to circumnavigate this limitation by collecting data for 8 consecutive days, several times a day, a plan that could plausibly provide a broad sampling of experience close in time to the occurrence of the relevant events. The authors sought to reduce memory bias and avoid global impressions of experience. The timing of the sampling frequency (every 150 minutes) was an attempt to balance global impressions and reduced compliance.

Third, the correlational findings were causally ambiguous and open to various interpretations. The correlation between negative affect and problems may have implied the tendency of participants to become upset in the face of problems. Distressed participants might have tended to interpret potentially ambiguous situations as problematic or threatening. Significant positive correlations between positive affect and positive events may have implied either the mood-enhancing quality of events or the tendency to view events more favorably when feeling euthymic.

Fourth and finally, again the use of a college student population limited generalizability to women in general. The fact that 96% of the sample was Caucasian also limits generalizability of the findings. Of further concern is the mean neuroticism score obtained in the sample. The score was higher than previously reported scores for college men and adult women (Costa and McCrae, 1992), suggesting that the sample was not well adjusted, thereby limiting the generalizability and possibly the reliability and validity of the findings.

However, on the whole, this study was a great addition to the research on anger. It was well written and easy to understand. Extraneous variables were controlled, and limitations were forthrightly stated. The conceptualization of the study was creative and provided much "grist for the mill" regarding future research.

Siegman et al., (1998) examined dimensions of anger and Coronary Heart Disease (CHD) in men and women by analyzing self-ratings versus spouse ratings. Siegman et al. proposed that a positive relationship existed between the personality trait of anger and CHD in men and women. They also proposed that positive relationships existed between

poor anger control and CHD; anger-out mode of anger expression and CHD; and anger-in and CHD for women. Siegman et al. also looked at cynicism and CHD.

Participants included 196 patients (101 men and 95 women) referred for thallium stress testing. Participants were administered a background information questionnaire, the State Trait Anger Expression Inventory (STAXI), the Cook-Medley Hostility (Ho) Inventory, Bendig's Manifest Anxiety Scale (MAS), and a structured interview that was used to rate interpersonal antagonism. Their spouses, using a special adaptation of the STAXI, which excluded State Anger, also rated the participants. Spouse ratings were obtained for 53 males and 43 female patients, for a total of 96 (Siegman, et al., 1998). A strength of this study was the comparison of this subsample and the entire sample, which found that there were no significant differences in demographic or health characteristics between the subsample and the entire sample.

After completing the questionnaire and inventories, all patients completed a stress test using the treadmill exercise test. Patients were monitored continuously during and 5 minutes after the stress test. The thallium test was completed, and participants were categorized according to the results of the thallium test (normal, documented CHD, or equivocal).

Although women obtained significantly higher spouse rated Angry Reaction scores than men (t [95] = 1.96, $p < .05$), there were no significant gender differences in relation to any of the self-report anger scores. Correlation between self-report and spouse report ratings were moderate (.16 to .50) although the factor structures were similar. The researchers utilized three "factor structures." Factor I combined the inability to control

anger and the outward expression of anger and was labeled Impulsive Anger-out. Factor II, for self-ratings, combined Anger-in and State Anger scales. Factor II, for spouse ratings, included Anger-in and Anger Reaction scales. Factor II was labeled as the Experience of Anger, or neurotic anger. Factor III combined the cynicism scales, which will not be discussed as they are beyond the purpose of this review. The two Trait Anger dimensions, Angry Temperament and Angry Reaction demonstrated different relationships with anger-in and anger-out. Angry Reaction appeared to be a measure of experiential neurotic anger. Angry Temperament was primarily a measure of outwardly expressed anger.

Siegman et al., (1998) found that only impulsive anger-out (Factor I scores) based on spouse ratings correlated significantly with CHD. Separate regression analyses for male and female patients found the Factor I (spouse rating) and CHD to be significant for males but not females. Another finding of Siegman et al. (1998) was the significant relationship between Anger-out self-ratings and disease status ($p < .05$). There was a significant interaction of Gender x Anger control, with men having a significant inverse relationship between Anger control and CHD. Separate regression analysis for male and female patients demonstrated that the relationships between Angry Temperament and CHD and between Anger Control and CHD were significant for males only.

Siegman et al., (1998) proposed that the two types of anger expression (anger-out and anger-in) were reflected in the two types of trait anger (Angry Temperament and Angry Reaction). Siegman et al., (1998) suggested that outwardly directed impulsive

anger was a risk factor for CHD. The authors sited Crane (1981) and stated that inwardly experienced, neurotic anger was a risk for hypertension.

There was no support from the data for the hypothesis that women would demonstrate a positive relationship between anger-in and CHD. Siegman et al., (1998) suggested that different aspects of anger/hostility domain, not measured in the current study, might be related to CHD in women.

The limitations of the study included the use of self-report measures, a fact that might be a confounding factor of social desirability response bias and/or a recall bias. Spouse report measures appeared, in this study, to be more valid prognosticators of CHD than self-ratings. Siegman et al., (1998) strongly suggested that self-report measures be supplemented with anger ratings obtained from peers or spouses. Another limitation that Siegman et al., (1998) reported was that the findings needed to be replicated as their study was a case-control study.

Inventories and Emotion Induction

Four remaining studies reviewed in this section focused on the experiencing of emotion during the experiment. Several different methods were used to produce an emotional experience for the participant, and the emotional experience was then coded and analyzed. One study used the Thematic Apperception Test with a harassment phase to create anger in the subject. In another study, in order to induce anger, the participants were provided with blasts of white noise in accordance with their performance. A third study used an emotion induction procedure that was coded for facial expression of emotion. The fourth study compared an emotional task with a cognitive task.

Faber and Burns (1996) hypothesized that the degree to which individuals expressed anger during harassment would mediate relationships between anger management style and cardiovascular recovery from harassment. The researchers also hypothesized that if anger expression lead to cardiovascular recovery then self-reported anger-out participants would return to initial cardiovascular levels more quickly than anger-in participants.

Sixty-three undergraduates (31 men and 32 women) participated in the study. SBP, DBP, and HR were continuously monitored during the baseline and TAT card storytelling. TAT cards were administered in a fixed order with harassment (i.e., the examiner became critical of the story) and nonharassment phases fixed for all participants in order to avoid differential carryover effects. During the nonharassment phase (Cards 1, 2, 5, 13MF), the experimenter did not evaluate or comment aside from facilitating progress from one card to the next. During the harassment phase (Cards 4, 6GF, 8BM, 9GF) participants were told that the previous stories had been "somewhat ordinary" and that they should try harder to make the stories interesting. After the sixth and seventh cards, the experimenter indicated that the stories were inadequate and that the subject should "make some effort" to improve them. The experimenter interrupted the subject with a critical comment and then encouraged them to finish. A 5-minute recovery period followed. During the storytelling of the TAT cards, the degree of anger verbally expressed through the content of the stories was coded for both words connoting aggressive behavior and words reflecting angry/hostile affect. Ratios of anger words to total words were computed to create variables of "expressed aggressive behavior' (EAB)

and "expressed angry/hostile affect" (EAHA). Participants also completed the Anger Expression Inventory.

Mixed between- x within-participants (2 genders x 7 phases) ANOVAs were conducted to determine whether HR, SBP, and DBP changed from baseline to the storytelling and through the recovery phase for both men and women. For SBP only, men showed higher SBP scores across baseline, nonharassment, harassment, and recovery phases (F [1, 62] = 11.43, $p < .001$). Overall effects for Phase emerged for SBP, DBP, and HR. Gender x Phase interactions were nonsignificant. Post hoc ANOVAs demonstrated that SBP and DBP increased significantly from baseline to the second period of harassment (F [1,62] = 13.5, $p < .001$; F [1, 62] = 10.21, $p < .002$). Post hoc ANOVAs also demonstrated that HR increased significantly from baseline to nonharassment phase (F [1, 62] = 108.34, $p < .0001$). Blood pressure responses increased significantly from baseline to the second half of the harassment phase similarly for men and women. HR increased during storytelling regardless of experimenter harassment.

Measures of expressed anger demonstrated increases during the harassment phase. A Gender main effect was found for the EAHA ratio only (F [1, 62] = 7.22, $p < .009$), a fact which indicated that women used a higher ratio of angry/hostile words to total words than men across the nonharassment and harassment phases. Significant effects for Phase were found for EAB (F [2, 124] = 26.27, $p < .0001$) and EAHA ratios (F [2, 124] = 9.06, $p < .0001$).

ANOVAs were conducted to establish mediation. Men and women did not differ significantly on anger-out (F [1,62] = .05, ns) or anger-in (F [1,62] = 1.22, $p = .22$).

Results demonstrated that the higher the anger-out management style of anger endorsed by men and women, the greater the increase in the expression of words connoting angry/hostile affect from nonharassment to harassment. Another finding of Faber and Burns' (1996) study suggested that men and women high on anger-out showed the highest SBP elevations during harassment. However, during early and middle phases of recovery, men high on anger-out and women low on anger-out showed levels of SBP sustained above baseline levels.

Regression equations demonstrated that men who expressed much anger sustained greater SBP and DBP elevations during recovery than men who expressed little anger, whereas women who expressed little anger maintained greater SBP and DBP elevations above baseline during recovery than women who expressed much anger. Faber and Burns (1996) suggested that the women with high anger-out who had a return to baseline SBP following harassment had expressed words reflecting angry/hostile affect frequently, a fact which may accounted for their SBP returning to baseline. Low anger-out women who infrequently expressed angry/hostile affect and sustained their higher SBP may be accounted for due to the infrequent expression of anger.

The results suggest that women who are self-reported anger expressers may have a low risk for CHD due to the beneficial cardiovascular effects of expressing their anger. However, women who inhibit anger may be at an increased risk for CHD due to the pathogenic effects of inhibiting anger expression.

The limitations of the study again include the use of the college student population, which limited generalizability. One limitation stated by Faber and Burns

(1996) concerned the gender of the experimenter. Faber and Burns questioned whether men would have expressed more anger if the experimenter were male rather than female. Another limitation of the study reported by Faber and Burns was the use of a projective measure as the target of the anger instead of direct confrontation with the experimenter. This method might have been too indirect for some participants. Further research should compare the direct versus indirect expression of anger in an experiment. A final limitation of the study, according to Faber and Burns was the use of the Anger Expression Inventory, which may tap the verbal expression of anger but not the aggressive or counter-aggressive behavior as an expression of anger.

Nunn and Thomas (1999) studied the role of self-esteem and gender in anger expression. They hypothesized that men and women with high self-esteem would not differ in anger expression when provoked. Women and men with low self-esteem were expected to differ in anger expression, with men displaying more anger-out responses and women more anger-in responses. Sixty-three college students (20 male and 43 female) participated in the study. Each participant was administered the Self-Esteem Scale (SES) and the State Anger Scale (SAS).

Participants were asked to complete five IQ problems and report their answers to each question out loud. A confederate was told, in the presence of the participant, to evaluate the responses of the participant by blasting white noise, with the intensity of the noise reflecting like or dislike. Intensity would range from 1 to 9, with higher intensity for less liked responses. The subject was lead to believe that the blast came from the confederate, but it actually came from the experimenter, who gave blasts of white noise

regardless of the response of the participant. In order to anger the participant, four of the five responses received blasts at level 9, indicating extreme dislike. One response received a blast of 1, but it was never in response to the first or last response of the participant in order to avoid primacy or recency effects. Participants completed a packet of questionnaires supposedly to assess perception that included the SAS as a check of anger manipulation. Participants were then given the opportunity to blast the confederate with white noise as they completed the five-question IQ test.

ANOVAs were conducted to determine whether differences in responding were due to self-esteem and anger expression rather than differential degrees of anger. Males and females were found to have equal levels of anger ($\underline{F}$ [1, 59] = .60, ns). Participants with low self-esteem had higher levels of anger than participants with high self-esteem ($\underline{F}$ [1, 59] = 4.10, $\underline{p} < .48$). There was no interaction between gender and self-esteem levels.

ANOVAs examined separate and joint effects of gender (male vs. female) and self-esteem (high vs. low) on anger expression (level of white noise administered). A main effect of gender was revealed, as males used higher levels of white noise than females ($\underline{F}$ [1, 59] = 17.38, $\underline{p} < .001$). A significant gender x self-esteem interaction was demonstrated on the low self-esteem level as males administered higher levels of white noise to confederates than females ($\underline{F}$ [1, 25] = 12.17, $\underline{p} < .002$).

Nunn and Thomas (1999) proposed that self-esteem would mediate the effects of gender on anger expression, with male participants reacting with more anger-out and women utilizing more anger-in methods. However, men and women with high self-esteem did not differ in the expression of their anger. Low self-esteem men reacted in an

anger-out manner whereas low self-esteem women reacted in an anger-in manner. Nunn and Thomas offered an explanation of low self-esteem men and women relying on socialized gender roles and gender stereotyped responses to their anger, whereas high self-esteem men and women did not. They cited previous research that demonstrated a link between sex-role identity and self-esteem, as masculine and feminine sex-role typed individuals were found to have low self-esteem (Major, Carnevale, & Deaux, 1981; Spence, 1982). Another finding along similar lines was that participants with low self-esteem, whether male or female, were more readily angered. The researchers proposed that participants with low self-esteem might have perceived the blasts of white noise as an attack on the self. They hypothesized that differential experiences of anger might be related to the maladaptive expression of anger by low self-esteem males and females.

Limitations of the study by Nunn and Thomas (1999) included the use of a college sample, which limits generalizabilty. A second limitation was the use of self-reports, which might be confounded by response bias and social desirability. A final limitation of the study was the use of the blasts of white noise, which are not explained or operationalized. Levels are not explained, apart from numbered ratings from 1 to 9. Replication of this study would be difficult, due to the lack of specificity in the procedure.

Malatesta-Magai et al., (1992) examined Type A behavior patterns and emotion expression in younger and older adults. It was hypothesized that Type As would show elevations on anger but not other negative emotions. Type As would show an elevation of anger but would exercise greater behavioral inhibition of anger as measured by facial

expressivity. Older Type As would demonstrate more overt signs of anger than younger Type As. Women, regardless of Type, would demonstrate greater conflict around the expression of emotion, especially anger, which would be measured by affective masking.

One hundred sixty participants were randomly chosen from graduate and undergraduate classes, continuing education classes, and senior centers, and were included in a balanced factorial ANOVA design (80 younger participants and 80 older participants, with equal numbers of men and women and Type As and Type Bs in each age group). ANOVA tests indicated no difference on amount of education by age, gender, or type. Participants completed measures of anger (State-Trait Anger Expression Inventory), anxiety (State-Trait Personality Inventory) and depression (BDI) as well as the Crowne-Marlowe Social Desirability Scale, which was intermingled with items from the Cook-Medley Hostility Scale.

Participants underwent an Emotion Induction procedure, where recent events were verbally recounted with target emotions of interest-excitement, sadness, fear, anger, and affection. Four orders were created, with each of the four target emotions in first and last positions once, in order to assess the possibility of primacy and fatigue effects. Affection, included as a target emotion to restore the subject to a positive mood at the end of the procedure, was not included in analysis. Participants were asked to rate their self-consciousness during the induction and rating procedure. Middle sections of the emotion induction procedure, which contained more overt affectivity and counterbalanced the effect of self-consciousness, were coded for facial expressivity.

Participants were then coded by facial expressivity using an adaptation of the Maximally Discriminative Facial Movement Coding System (Max), a theoretically based, anatomically linked objective component coding scheme developed by Izard (1979) and adapted by Malatesta and Izard (1984) for use with older faces. Facial muscles were studied and coded for the presence of, and changes in, muscle movement patterns related to emotion on a second-to-second basis. A Structured Interview (SI) followed the Emotion Induction procedure and was intended to elicit reactivity in persons prone to impatience and irritation.

ANOVAs indicated that order of the four randomly assigned standard orders of emotion did not affect any dependent measures. Therefore, Age, Gender, and Type (A or B) made up the three-way factorial design as independent variables with personality dependent variables. One unexpected finding was the result of higher scores for the older adults on social desirability and higher scores for self-consciousness for younger adults. ANOVAs and ANCOVAs were conducted due to this finding; however, ANCOVA results did not alter the pattern of findings disclosed by the ANOVA. ANOVA results were reported.

ANOVAs on the emotion ratings indicated that similar levels of anger, fear, and sadness were experienced across participants with no age, gender or type effects or interactions. As for the hypotheses, Type A participants scored higher than Type Bs on overall anger (F [1, 158] = 4.57, $p < .04$) and on a related measure of trait aggression (F [1, 158] = 6.43, $p < .02$).

An Age x Sex x Type effect for anger-in was the only differential pattern for Type As vs. Type Bs (F [1, 158] = 6.63, $p < .01$). Young male Type As scored higher on anger-in than young male Type Bs (F [1, 79] = 3.7, $p < .05$). In terms of experienced anger, older participants reported lower levels than younger participants (F [1, 158] = 10.96, $p < .002$). However, young women had higher overall anger scores than any other age-gender group (F [1, 158] = 9.44, $p < .002$). Older participants reported less anger-in than younger participants (F [1, 158] = 7.55, $p < .007$), and more younger women than older women reported more anger-in (F [1, 159] = 1.58, $p < .02$). Older participants expressed more emotions (F [1, 159] = 5.53, $p < .02$). Older women displayed more anger-rage than any other age-gender group (F [1, 79] = 3.86, $p < .05$), and women displayed more positive blends (smiling during negative affect induction) than men (F [1, 79] = 5.62, $p < .02$).

Limitations of the study by Malatesta-Magai et al., (1992) includes an older sample, taken from continuing education classes and senior centers, which might have been somewhat nonrepresentative, due to the comparable level of education of the older adults as compared to the younger adults. The results of the older adults may be less generalizable (Malatesta-Magai, et al., 1992). The use of facial expressivity and the time consuming and difficult task of coding might have limited the replication of this study. Overall, the study was well designed and executed, and it offered many possible areas for future research.

The final study of emotion induction examined the psychosocial factors associated with cardiovascular reactivity in older adults. Vitaliano et al., (1993)

hypothesized that psychosocial factors and cardiovascular reactivity were generalizable to older adults and that a difference in reactivity existed between older adults. Finally, reactivity with psychosocial and vulnerability variables differed for emotional and cognitive challenges.

Participants included two groups of men and women, spouse caregivers of individuals with Alzheimer's disease (N = 82) and a control group (N = 78) that was matched for age and gender. Only Caucasian participants were used. Self-report measures were administered including State-Trait Anger Scale, Anger Expression Scale, Avoidance Scale, Framingham Type A Behavior Pattern Scale, the Extended Health Questionnaire, and the Screen for Caregiver Burden. A Rating of Expressed Emotion was obtained through a verbal analysis of the Five-Minute Speech Sample that was coded for criticism and emotional over-involvement. Participants were randomly assigned to either the cognitive (Digit Symbol subtest of the WAIS, requiring written and verbal responses) or the emotional task, which was to speak for 5 minutes about their spouses and their current relationship. Cardiovascular responses were recorded before, during, and after the cognitive or emotional task for each subject.

Regressions were performed with caregiver status, expressed emotion rating, Type A, hostility, Anger Expression, and Avoidance scales predicting SBP, DBP, and HR reactivity. MANOVAs were executed to check the randomization of the order of the tasks and no differences were found. SBP and DBP were higher for the emotional task as compared to the cognitive task. HR did not differ. Vitaliano et al, (1993) proposed that caregiver status was not related to cardiovascular reactivity. Regression statistics found

that women had greater reactivity than men had during the emotional task and that no difference was found for the cognitive task. Hostility, controlled anger, suppressed anger, avoidance coping, caregiver status, and the interaction of caregiver status with hypertension added to the prediction of SBP reactivity. Avoidance, expressed anger, expressed emotion, and the interaction of expressed emotion and expressed anger explained DBP reactivity. Expressed emotion, Type A and the interaction of gender and Type A behavior explained HR reactivity. Both suppressed and expressed anger influenced reactivity. For the cognitive task, the greater the controlled anger, the greater the SBP reactivity. Overall, Vitaliano et al., (1993) reported that a person's emotional context influences relations between psychosocial factors and reactivity and that reactivity is greater in response to an emotional rather than cognitive task. Older women exhibited greater reactivity than older men, though only in response to the emotional task. Vitaliano et al., (1993) offered that the difference between men and women was due to the fact that women may be more responsive when discussing their spouses or the quality of their marriage as the relationship was a more important issue. Another possibility is that older women are able to be more responsive than older men.

Limitations of the study, as proposed by Vitaliano et al., (1993), include the short duration of a 10-minute baseline, a fact which may have restricted the correlations with reactivity. The low associations observed between predictor and reactivity variables in the regression equation were a second limitation. A third limitation involved the use of homogeneous caregiver and control groups, which limits generalizability. Due to the

many tests performed, the results may be influenced by chance and should be replicated with caution.

Discussion and Conclusions

The studies reviewed in this paper reflected three types of investigative methodology. The first was the use of inventories and questionnaires with participants, assessing their anger expression style and other factors such as depression or self-esteem. The second type of methodology utilized inventories and questionnaires as well as activities meant to induce health, stress, or emotional reactivity. The third methodology utilized inventories and questionnaires, activities meant to induce health, stress or emotional reactivity and an emotion induction procedure that created an emotional experience for the subject in the laboratory setting. The three types of studies have been reviewed separately. A synthesis of the findings, limitations, and areas for future research concluded the review of each study.

Six of the seven inventory and questionnaire studies, three of the four inventory and activity studies, and two of the four emotion induction studies used samples from college populations. Results of these studies have a limited applicability due to the nonrepresentative nature of the sample (Anderson & Lawler, 1995; Burns, 1995; Faber & Burns, 1996; Fischer, et al., 1993; Kopper, 1993; Kopper & Epperson, 1991; Martin & Watson, 1997; Moreno, et al., 1994; Newman et al., 1999; Nunn & Thomas, 1999; Sperberg & Stabb, 1998).

The results of the studies of college-aged men and women found little or no difference between men and women on anger-control and anger-in, which were the best indicators of the suppression of anger (Faber & Burns, 1996; Fischer, et al., 1993; Kopper, 1993; Kopper & Epperson, 1991; Newman et al., 1999). Nunn and Thomas (1999) found no difference in anger expression between men and women with high self-esteem; however, they did find that low self-esteem men were more likely to express anger and low self-esteem women were more likely to suppress anger. Nunn & Thomas proposed that self-esteem mediates gender and anger expression and accounted for the discrepancy between studies finding no gender difference in anger and those that did.

Sex role identity has been found to be a more robust predictor of behavior than gender is (Kopper, 1993; Kopper & Epperson, 1991). Masculine sex role types expressed higher levels of trait anger and anger-out (Kopper, 1993; Kopper & Epperson, 1991). Feminine types were associated with the least tendency to express anger (Kopper & Epperson, 1991). Feminine sex role types reported a greater tendency to control anger (Kopper, 1993). Men and women with low self-esteem tended to rely on socialized gender roles and gender stereotyped responses to their anger, with males demonstrating anger-out and females demonstrating anger-in (Nunn & Thomas, 1999).

The relationship between depression and anger-in was found to be markedly higher for women than for men (Newman et al., 1999; Sperberg & Stabb, 1998). Women and men may experience similar levels of internalized anger; however, women may be more likely to convert it to depressed symptoms than are men (Newman, et al., 1999). Anger-in was found to correlate highly with general negative affect and unpleasant daily

experiences for women, a fact which ties in with the negative mood and general distress of depression (Martin & Watson, 1997). The level of perceived mutuality in a partner relationship was found to relate to anger and depression. Sperberg and Stabb (1998) found that depression for women was associated with low levels of mutuality in their relationships and high levels of suppressed or inappropriately expressed anger. In contrast, Moreno, et al., (1994) found that women obtained higher scores on trait anger and self-criticism, a fact which they attributed to environmental factors that have increased hostility in women beyond the traditional expectation. One limitation of note for the result of Moreno et al.'s (1994) study was the use of a clinical sample, which may have skewed the results in a positive direction.

Health risks for college-age men were higher than college-age women, when measuring trait anger, stress situations, and cardiovascular reactivity (CVR), but college-age women demonstrated CVR when negative affect state and anger expression style interacted with a stress situation (Burns, 1995). One limitation of this finding focused on the competitive nature of stress tasks, which may not have induced the desired reaction in women, as it did in men (Burns, 1995). However, women who suppressed anger experienced greater blood pressure responses, which impacts CVR, than those who expressed anger (Anderson & Lawler, 1995; Faber & Burns, 1996). Women expressing anger-out were more likely than men to use angry and hostile words and demonstrated a return to baseline levels of SBP, which anger-in women did not (Faber & Burns, 1996). Type A college-aged women demonstrated greater systolic reactivity to the frustration of autonomy needs (i.e., limiting independence; Anderson & Lawler, 1995). All studies

measuring blood pressure and heart rate controlled for the confounding effect of caffeine. Studies with control groups attempted to measure more accurately the effects of anger expression and CVR (Burns, 1995).

The results of these studies may have been skewed by the subject's level of education, which was higher than the norm, and an IQ level that is average or above, which was also above the norm. Another factor that may have skewed results was the impact of societal changes such as the feminist movement, Equal Rights Amendment, and women entering the workforce, on generations born during and after the 1970s. A further limitation of the studies was the use of self-report. The results may have been skewed by response bias and/or social desirability on the part of the participants.

One of seven inventory and questionnaire studies, one of four inventory and activity studies, and two of four inventory and emotion induction studies used non-college samples. Results of the inventory questionnaire study included college students as well as faculty and staff, thereby obtaining a measure of anger expression for older women, while controlling, to some extent, the impact of education level (Thomas, 1997). Using an inventory and activity study, Siegman et al., (1998) used older men and women and implemented the use of a spouse report as well as self-report measures. Vitaliano et al., (1993) used participants in their late 60s and implemented a control group that was matched for age and gender. Malatesta-Magai et al., (1992) compared 80 younger and older adults for emotion expression and Type A behavior patterns.

Thomas' study of older and younger women using inventory and questionnaire methods found significant differences between the two groups. Health results for older

women found higher DBP and SBP when anger was suppressed (Thomas, 1997). Anger suppression at home was also related to higher DBP and SBP, regardless of age (Thomas, 1997). Younger women were more likely to express their anger and come from families that expressed anger (Thomas, 1997). This result may be explained by the changes in society and culture as mentioned above.

Maltesta-Magai et al., (1992) found that Type As, regardless of age, scored higher on overall anger, anger-in, and aggression. However, Type As demonstrated a pattern of shame and anger. Young women had higher anger scores than any other age-gender group. Younger women also suppressed anger more frequently than older women. This finding coincided with the result of older adults ($\underline{M}$ = 69 years) expressing more anger than younger adults ($\underline{M}$ = 28 years). One factor that limits the results is that of education. The older adults in the study had a higher level of education than the norm. In fact, the older adults' level of education was not significantly different from that of the younger adult group. The results of the older sample may not be generalizable due to the nonrepresentativeness of the sample.

Vitaliano et al., (1993) found that older adults had greater reactivity to emotional tasks and demonstrated greater blood pressure reactivity with higher hostility, expressed emotion (e.g., criticism) and anger expression. Women demonstrated greater reactivity to the emotional task than men did. This study was also limited by a nonrepresentative sample, which was Caucasian. The societal impact and social desirability may have had similar effects on both the sample and control groups, as they were so close in age and cultural experience.

Siegman et al., (1998) found no significant gender differences in anger scores. Impulsive anger-out was found to be significant for males only and correlated with CHD. Anger-in did not correlate with coronary heart disease. Anger-in was found to be a risk factor for hypertension.

Although the purpose of this review was to learn more about the style of anger expression for women and its impact on relationships and health, what can truthfully be surmised is that not that much more is known now than prior to the completion of the research. It was learned that younger women may likely express their anger more freely, but this finding may be the result of the sample and the impact of society. Women are still more conflicted about expressing anger than men are. Whether this is due to the role of relationship in a woman's life or the level of mutuality in the relationship is yet to be discovered. It is known that societal changes have turned the role of women upside down. There is greater academic and vocational freedom as well as an increase in the behavioral freedom of expression. Women do not necessarily move from their parents' homes into the homes of their spouses. Women are also changing careers later in life and going back to school to pursue a degree. How does this change in the level of freedom and choice available to women impact anger expression?

One of the major hypotheses of interest was that of the impact of the relationship on anger expression. However, only one research study even began to address the issue of relationship and the role it plays in the lives of women. Would a healthy, loving, and supportive spousal relationship make a difference in the level or style of anger expression? Would women feel less conflict about expressing anger in a committed

relationship? It is suspected that the answer is yes to both questions posed. A woman who is grounded and secure in her relationship with her spouse may feel a greater level of comfort and freedom to express anger without fear of abandonment or emotional withdrawal of the spouse. Anger would be welcomed as an expression of two separate people coming together in a relationship. The lack of anger in a relationship could lead one to question whether both parties are "showing up" and relating in a real and vital manner. It may be likely that one partner is suppressing that which makes him or her separate and different. Conflicts are avoided, and anger is suppressed, but at what cost? Does the woman exist as a separate human being, with the spectrum of human emotional experience, or is she cut off from her emotions and her true self?

Would a deep and lasting female friendship provide the safety and space to impact a woman's ability and/or comfort level with expressing anger? Can women learn to express anger in the context of a friendship and then broaden their tolerance and ability to experience anger in a productive and connecting manner? Women may then be able to take what they have experienced with other women and implement the expression of anger with their spouses. Regardless of the relationship, any connection that offers the opportunity to experience truth, grace, and love should be taken. That includes the experience of anger and its expression.

Would a satisfying spiritual relationship with God make any difference? Would women take all their anger and negative emotions to God and leave them with Him? Would they learn to take back their anger and process it in a healthy manner that brings beneficial results to those with whom they are in conflict? Does the church still influence

women's expression of anger? These are just a few of the questions that future research could address.

Future research is needed to evaluate the effects of anger expression in women in terms of health and relationships. The research that is available has many limitations, such as the predominant use of college populations, the confounding variables of education, IQ, and numerous societal and cultural implications, the impact of self-report, the feasibility of peer and spouse reports, and better operationalized terms and measures. Researchers need to broaden their sampling to include individuals from all age groups, especially middle-aged men and women, as well as individuals from a variety of racial and ethnic groups. The issue of anger expression style and the relational impact in lesbian partnerships should also be explored along with further research into heterosexual partnerships.

Again, it is important to emphasize that the impact of mutuality and the powerful role that relationships play in women's lives seems woefully overlooked. There is a wide-open field of research relating women's anger expression to relationships waiting to be discovered, with a goldmine of potential information regarding self-esteem, self-perception, anger, and emotional and physical health and their impact on women.

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