

An Investigation of Type A Behavior,
Anger Expression, and Aggression in Men

E. Diane Hiebert-Murphy

A thesis submitted in partial fulfillment of a
Master of Arts degree in Psychology.

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AN INVESTIGATION OF TYPE A BEHAVIOR,
ANGER EXPRESSION, AND AGGRESSION IN MEN

BY

E. DIANE HIEBERT-MURPHY

A thesis submitted to the Faculty of Graduate Studies of
the University of Manitoba in partial fulfillment of the requirements
of the degree of

MASTER OF ARTS

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ABSTRACT

The Type A behavior pattern is a coping style characterized by extremes of competitive achievement striving, a sense of time urgency, and hostility. Evidence identifying the Type A behavior pattern as a risk factor for coronary heart disease has resulted in intense interest in the construct. Of particular relevance to the prediction of heart disease is the anger and hostility component of Type A behavior.

There is a group of studies which has focused on aggressive and hostile behavior in Type A individuals. There are, however, limitations in this research. A major limitation of these studies is the artificial nature of the paradigm used to measure aggression. This artificiality makes it difficult to generalize the findings to natural settings. A second limitation of the research is the unclear role of provocation in eliciting A-B differences in aggression. The primary purpose of the present study was to examine the hostile interpersonal aggressive behavior of Type A and Type B individuals in a laboratory setting which closely resembles naturally occurring situations. This study also examined if provocation is necessary to elicit hostile aggression in Type A individuals, or if frustration

alone is a sufficient condition to produce A-B differences. Of secondary interest in this study was the relationship between aggression and anger expression, attributions, and assertiveness.

It was predicted that Type A subjects would demonstrate greater hostile aggression than Type B subjects and, relative to the control condition, this difference would increase in the frustration condition, and would increase further in the frustration-provocation condition. The secondary hypotheses included the predictions that anger expression, attributions of blame, and assertiveness would be associated with aggression.

To test the hypotheses, Type A and Type B (defined by the Jenkins Activity Survey Form T and the Structured Interview) male university students (N = 90) worked with a confederate on a variety of tasks. They were assigned to one of three conditions: a control condition, a frustration condition, and a frustration and provocation condition. Following their interaction on the tasks, subjects had the opportunity to select one of three feedback scripts (which differed in aggressive content) and give it to the confederate. Self-reported affect, attributions, ratings of the confederate, assertiveness and anger expression were assessed.

The hypotheses were tested using univariate analyses of variance and Pearson product moment correlations. When

appropriate, the analyses of variance were followed up by post hoc comparisons using Dunn's (1961) procedure. In addition, a multiple regression analysis was done with aggression (as measured by script choice) as the dependent variable and with measures of Type A behavior, anger expression, attributions, and assertiveness as predictor variables.

The analyses of the changes in self-reported mood indicated that the experimental manipulations were effective. There were no A-B differences on these mood measures. The tests of the major hypotheses indicated that all subjects showed increased aggression in the frustration-provocation condition relative to the frustration and control conditions. Type A subjects, however, did not demonstrate greater hostile aggression than did Type B subjects in any condition. These findings are discussed in terms of the effects of the experimental context on the observation of A-B differences in aggression. It is suggested that A-B differences may apply to a fairly restricted range of circumstances.

The results also showed that anger expression was associated with aggression. The nature of this relationship, however, was inconsistent with prediction. Subjects classified as low on anger expression, high on anger-in, and low on anger-out showed greater aggression following provocation than did high anger expression, low

anger-in, and high anger-out subjects. An interaction between Type A behavior and anger-in was also found. Following frustration and provocation, low anger-in Type A subjects showed less hostile aggression than did low anger-in Type B subjects and high anger-in Type A and Type B subjects. These findings are discussed in terms of the measurement of anger expression and the relationship between anger expression and perceptions of control. It is suggested that the expression of anger is an important component in understanding behavioral aggression. As well, it is suggested that individual differences in self-reported anger expressiveness are important in A-B differences in aggression.

As expected attributions of blame for failure were associated with hostile aggression. More specifically, the greater the attributions to the attitude of the confederate, the greater the hostile aggression following provocation. It was also found that attributions to the subject's ability resulted in reduced aggression. These findings suggest that attributions play a mediating role in aggressive behavior. Regarding the relationship between attributions and Type A behavior, this study found only one attributional dimension on which there was an A-B difference. Problems in the measurement of attributions are discussed and suggestions are made about the direction for future research. Finally, no relationship was found between assertiveness and

aggression. The limitations of current measures of assertiveness are noted.

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INTRODUCTION

During the past 20 years, there has been increasing interest in the collection of behaviors termed the Type A behavior pattern (TABP). This interest is the result of research which has established the behavior pattern as an independent risk factor for coronary heart disease (CHD). The TABP is conceptualized as a coping style that individuals use in interaction with their environment. It is characterized by extremes of hostility, a sense of time urgency, and competitive achievement striving (Rosenman, 1978). Type B behavior is defined as a relative absence of these characteristics.

Various methods have been developed to assess this behavior pattern. The most frequently used measures of the TABP include the Structured Interview (SI) (Rosenman, Friedman, Straus, Wurm, Kositchek, Hahn, & Werthessen, 1964; Rosenman, Brand, Jenkins, Friedman, Straus, & Wurm, 1975), the Jenkins Activity Survey (JAS) (Jenkins, Rosenman, & Zyzanski, 1974; Jenkins, Zyzanski, & Rosenman, 1971), and the Framingham Type A scale (FTAS) (Haynes, Feinleib, & Kannel, 1980). These instruments have been validated on the basis of their ability to predict the development of CHD (Haynes et al., 1980; Jenkins et al., 1974; Rosenman et al., 1975).

The SI (Student Form) is comprised of 22 questions designed to elicit impatience, hostility, and competitiveness from susceptible individuals. Individuals are asked about their way of responding to various situations. Furthermore, some of the questions are presented in such a way as to elicit speech characteristics considered to be indicative of the TABP (eg. interrupting, answering prior to the completion of the question). The assessment of behavior type is based both on the content of the answers and on the style of responding. Individuals are classified as A-1 (fully developed Type A), A-2 (incompletely developed Type A), X (an equal amount of Type A and Type B characteristics), B-3, or B-4.

The JAS is a self-report measure of the TABP. The JAS-Form T (designed for use with students) contains 44 questions similar to those used in the SI. Scoring of the items is based on optimal weights generated from an analysis of the data from the Western Collaborative Group Study (WCGS) (Jenkins, Zyzanski, & Rosenman, 1971). The JAS-T is comprised of three subscales. These include measures of Type A behavior, speed and impatience, and hard-driving traits.

The FTAS is also a self-report measure. It contains 10 items that assess competitive drive, time urgency, and job pressures (Haynes, Levine, Scotch, Feinleib, & Kannel, 1978). These items were selected by a panel of three

experts from a 300-item questionnaire used in the Framingham Heart Study.

On the basis of existing data, it appears that each of these measures is reliable. For example, 80% of the men in the WCGS received consistent SI classifications over a period of 12 to 20 months. Furthermore, assessments of recorded interviews of men by two independent raters resulted in an agreement rate of around .75 to .90 (Rosenman, 1978). It has been suggested, however, that the rate of agreement may be lower for women (Haynes et al., 1980). Test-retest correlations of the various forms of the JAS have been between .60 and .70 over one to four year time intervals (Jenkins, 1978). The reported reliability for the FTAS is .71 for men and .70 for women (Haynes, Levine, et al., 1978).

Although each instrument is reliable in assessing Type A behavior, it is important to note that these measures do not assess the same aspects of the TABP. Comparisons of the three measures indicate that classifications of behavior type based on the JAS and the FTAS are consistent with the A-B classification made from the SI for only 60% to 70% of male subjects (Haynes et al., 1980; Jenkins, 1978).

It should also be acknowledged that in addition to these three measures, other instruments have been used (although less frequently) in the assessment of the TABP.

The Bortner Test Battery (Bortner & Rosenman, 1967), for example, consists of a series of tasks which attempt to assess Type A behavior by sampling components of the pattern more directly. The Bortner Rating Scale (Bortner, 1969) has also been used in measuring Type A behavior. This measure has 14 rating scales composed of a pair of adjectives separated by a line 1 1/2 inches in length. One of the adjectives reflects Type A behavior and the other reflects Type B behavior (eg. hard driving-easy going). Subjects are asked to indicate where they think they belong between the two extremes. Distances from the Type B descriptors are measured and summed over the items to obtain the Type A score.

Type A Behavior and Coronary Heart Disease

The interest of behavioral medicine researchers in the TABP is due largely to studies which have established it as a risk factor in CHD. An association between behavior and heart disease was first noted in the literature in the early 1900s when Osler described coronary-prone individuals as people who are keen, ambitious, and "whose engines are set full speed ahead" (Chesney, Black, Chadwick, & Rosenman, 1981, p. 218). Qualities such as aggressive, compulsive, achievement-oriented, hostile, and hard-driving were later added to the description (Arlow, 1945; Kemple, 1945; Menninger & Menninger, 1936). In light of the evidence

suggesting that traditional risk factors (eg. excessive smoking, hypertension, elevated serum cholesterol, lack of exercise) predict less than one half of the new cases of CHD (Jenkins, 1971, 1976; Suinn, 1982), researchers have become increasingly interested in identifying the psychological and behavioral variables which are predictive of heart disease. It is from observations of cardiac patients that the TABP emerged as a description of behaviors frequently found in coronary-prone individuals (Friedman & Rosenman, 1974).

Retrospective Studies. There is a large body of literature examining the relationship between the TABP and CHD. A subset of these studies used retrospective designs in which individuals with CHD were compared to individuals without CHD. Although unable to demonstrate a cause and effect relationship, these studies provide evidence of an association between the TABP and CHD. For example, in an early study, Keith, Lown, and Stare (1965) studied groups of male patients aged 35 to 55 years who were diagnosed as having clinical CHD, peptic ulcers, or neither of these diseases. Contrary to expectation, only one half of coronary patients were defined as Type A (according to the SI), although noncoronary patients were more closely associated with the Type B behavior pattern. When the subjects were divided into two age groups (35 to 44 years and 45 to 49 years) however, it was found that there was an association between Type A behavior and coronary artery

disease (CAD) in the younger patients. Patients beyond age 45 years, however, showed a preponderance of Type B behavior. Clearly, these findings are not completely consistent with the Type A hypothesis. Subsequent studies, however, have provided stronger support for the proposed association between the TABP and CHD.

Caffrey (1969), for example, studied four groups of monks who had different rates of myocardial infarction (MI) (death of a distinct mass of the myocardium due to interruption of the blood supply to the area). The four groups included Benedictine Priests, Benedictine Brothers, Trappist Priests, and Trappist Brothers. Benedictine Priests, who had the highest rate of MI, were also found to manifest more of the TABP as assessed by the SI. Further analysis revealed that MI cases scored higher on a Type A factor (which was based on the SI) than did all other monks (Caffrey, 1970).

In a later study, Kenigsberg, Zyzanski, Jenkins, Wardwell, and Licciardello (1974) studied male and female patients aged 22 to 64 years. They compared subjects hospitalized with CHD with subjects hospitalized with noncardiovascular diseases. The coronary patients were drawn from the post-coronary unit and the control subjects were patients hospitalized for surgery or traumatic injury. The CHD patients were found to score more in the Type A direction (based on JAS scores) and were more hard-driving than patients with other health problems.

In a similar study, Wardwell and Bahnson (1973) examined 114 men who had been hospitalized for a MI, 114 men who had been hospitalized for other serious illnesses, and 145 healthy men from the community. Subjects in each group were matched for age. All men were interviewed in their homes, the sick men during convalescence. The TABP was assessed with an original scale of 17 items administered during this interview. As predicted, Wardwell and Bahnson found that the men with MI scored higher than the other groups on their scale of the TABP.

In a large retrospective study, Shekelle, Schoenberger, and Stamler (1976) examined the prevalence of MI in 1,208 middle-aged men who were among a larger group of persons entering screening programs of the Chicago Heart Association. When age, serum cholesterol, diastolic blood pressure, and cigarette smoking were controlled, the Type A score (based on the JAS) was a significant correlate of coronary disease prevalence.

Further support for the association between CHD and Type A behavior comes from research conducted in Europe. Appels, de Haes, and Schuurman (see Kornitzer, Kittel, De Backer, & Dramaix, 1981) for example, studied a sample of 2,712 Dutch males aged 49 to 59 years. Men with angina pectoris (pain in the chest precipitated by excitement or effort and due to interference with the supply of oxygen to the heart muscle) scored higher on the A-B scale of the JAS

than the rest of the sample, although no differences were found between men with and without a history of MI.

In a study conducted in Poland, male patients with MI were compared with medical patients without cardiovascular disease and with healthy control subjects (Zyzanski, Wrzesniewski, & Jenkins, 1979). Zyzanski et al. found that patients with a history of MI scored higher than the comparison groups on the A-B scale and the hard-driving scale of the JAS.

In a similar study, Heller (1979) compared patients who had sustained a MI with control subjects matched for age and marital status. The MI patients scored higher on the Bortner scale (which was used to assess behavior type) than the control group. Clearly, this study replicated the findings of Zyzanski et al. (1979).

More recently, Kornitzer et al. (1981) studied the relation between the TABP and the prevalence of CHD in the Belgian Heart Disease Prevention Project. The sample was comprised of 6,112 employed males. Consistent with earlier studies, these researchers reported that subjects with CHD scored higher on the JAS A-B scale than subjects without CHD. More specifically, when subjects with CHD were divided into subgroups, it was found that subjects with angina pectoris or with ECG abnormalities and known CHD scored higher on the JAS A-B scale than subjects without CHD.

Patients with ECG abnormalities with no angina pectoris and no history of CHD, however, did not differ from control subjects on the Type A scale, although they scored higher on the JAS Speed and Impatience scale (JAS-S).

Additional support for the association between heart disease and the TABP comes from a cross-sectional study of 558 men in Caerphilly, South Wales (Gallacher, Yarnell, Elwood, & Phillips, 1984). To assess behavior type, subjects were administered a subset of items from the FTAS. Although no relationship was found between Type A behavior and MI or electrocardiographic evidence of ischaemia, the results confirmed that Type A scores were higher for men with angina compared to men without angina.

Although these retrospective studies provide support for the association of the TABP and CHD, the findings cannot be used to support a causal inference. As Haynes, Feinleib, Levine, Scotch, and Kannel (1978) suggest, there are at least three possible interpretations of the findings: the TABP could have developed after the onset of CHD, a higher proportion of subjects lacking the TABP may have died before the studies began, making coronary survivors overrepresented on the Type A factor, or, the TABP may be an independent risk factor in CHD. In order to establish the TABP as a risk factor, prospective studies have been conducted. In these studies, Type A and Type B individuals free of CHD were followed for a number of years. The incidence of CHD in these individuals was examined.

Prospective Studies. Evidence for the TABP as a risk factor in CHD was initially derived from the WCGS (Rosenman, Brand, Sholtz, & Friedman, 1976; Rosenman, Friedman, Straus, Jenkins, Zyzanski, & Wurm, 1970; Rosenman, Friedman, Straus, Wurm, Jenkins, & Messinger, 1966; Rosenman et al., 1964). Beginning in 1960, this project was a prospective study of CHD incidence in 3,524 employed men aged 39 to 59 years at intake. These men were administered the SI at the start of the study and were followed for a period of 8 to 9 years. Clinical CHD occurred in 257 subjects during follow-up. Type A individuals were found to have an estimated risk 2.21 times that of Type B individuals in the younger age group (39 to 49 years), and 2.31 times that of Type B individuals in the older age group (50 to 59 years). After adjustment for traditional risk factors the relative risks remained 1.87 and 1.98 respectively (Rosenman et al., 1975). Because the predictive relationship between the TABP and CHD could not be accounted for by other risk factors, it was concluded that the behavior pattern is an independent risk factor for CHD.

In another prospective study of 2,750 men participating in the WCGS, Jenkins et al. (1974) reported that the JAS is also a valid means of measuring the way in which behavior contributes to coronary risk. In this study, high scorers on the JAS compared to low scorers had twice the incidence of new CHD over a four year period. It is interesting to

note that in two samples drawn from the WCGS, Type A scores (based on the JAS) were also associated with increased risk of reinfarction among persons already having CHD (Jenkins, Zyzanski, & Rosenman, 1976; Jenkins, Zyzanski, Rosenman, & Cleveland, 1971). A related finding is reported in a study of recurrent infarction among patients with CHD. Bruhn, Paredes, Adsett, and Wolf (1974) found that Type A behavior (assessed by the SI) was associated with coronary death.

The Framingham Heart Study is a study similar to the WCGS. In this research 1,674 coronary-free men and women were followed for the development of CHD over an eight year period. Consistent with the finding of the WCGS, the Framingham Study reported that Type A men and women were at increased risk for developing CHD (Haynes et al., 1980).

A third large prospective study of 6,579 Swedish construction workers also provides support for the hypothesis that the TABP is a risk factor in CHD (Theorell, Lind, & Floderus, 1975). In this study, subjects were followed for a 12 to 15 month period with regard to death from all causes and hospitalization for MI. A 10-item "discord index", composed of 5 items reflecting Type A behavior, predicted a significant number of MIs.

Thus, there is evidence which not only documents an association between the TABP and CHD, but also establishes the TABP as an independent risk factor in the development of

CHD. More recent studies, however, have failed to find a significant association between the TABP and CHD. For example, in the MRFIT study, a large-scale prospective study, neither the SI or the JAS predicted cardiovascular events or mortality among CHD-free subjects with multiple risk factors (Shekelle, Hulley, Neaton, Billings, Borhani, Gerace, Jacobs, Lasser, Mittlemark, & Stamler for the MRFIT Research Group, 1985). As well, two studies found that the TABP (as assessed by the JAS) failed to predict recurrent CHD events in post-MI patients (Case, Heller, Case, Moss, & the Multicenter Post-Infarction Research Group, 1985; Shekelle, Gale, & Norusis for the Aspirin Myocardial Infarction Study Research Group, 1985).

Type A Behavior and Physiologic Processes. A group of studies have specifically addressed the relationship between the TABP and the extent of underlying coronary artery disease (CAD) to identify the pathophysiological link between the TABP and CHD. For example, Friedman, Rosenman, Straus, Wurm, and Kositchek (1968) studied 51 autopsy subjects in order to identify the possible relationship between the nature and intensity of the atherosclerosis present and the subjects' behavior during their lives. It was found that subjects who were Type A succumbed to CAD six times more frequently than subjects who were Type B. As well, regardless of the actual cause of death, Type A individuals exhibited severe coronary atherosclerosis six times more frequently than did Type B individuals.

The results of the Friedman et al. (1968) study are supported by a series of studies using angiographic findings as a measure of CAD. In these studies, the extent of CAD was positively correlated with both the JAS (Zyzanski, Jenkins, Ryan, Flessas, & Everist, 1976) and the SI assessment of behavior type (Blumenthal, Williams, Kong, Schanberg, & Thompson, 1978; Frank, Heller, Kornfeld, Sporn, & Weiss, 1978; Williams, Haney, Lee, Kong, Blumenthal, & Whalen, 1980). These findings, however, are not unequivocal. Several studies have found no link between the JAS assessment of the TABP and angiographic findings (Blumenthal et al., 1978; Dimsdale, Hackett, Hutter, Block, & Catanzano, 1978; Dimsdale, Hackett, Hutter, Block, Catanzano, & White, 1979). As well, three studies found no relationship between the SI assessment of Type A and angiographic findings (Dimsdale et al., 1979; Krantz, Sanmarco, Selvester, & Matthews, 1979; Scherwitz, McKelvain, Laman, Patterson, Dutton, Yusim, Lester, Kraft, Rochelle, & Leachman, 1983). In one additional study, the researchers found no relationship between their own questionnaire assessment of Type A behavior and CAD (Young, Barboriak, Anderson, & Hoffman, 1980). In view of these inconsistent findings, it appears that further examination is needed before a strong statement can be made about the role of the TABP in CAD and the process of atherosclerosis.

CHD, Type A, and Hostility

In response to the recent evidence which does not support a relationship between the global TABP and CHD, there has been interest in identifying which components of the pattern predict CHD. The research to date suggests that the anger and hostility component is particularly relevant to the prediction of CHD (Diamond, 1982; Matthews, Glass, Rosenman, & Bortner, 1977; Spielberger & London, 1982; Williams & Barefoot, in press).

Hostility and CHD. Long before the formulation of the TABP a relationship between anger, hostility and aggression, and CHD was observed. Initially, psychodynamically oriented writers noted the aggressive characteristics of coronary patients and attempted to uncover the underlying motives or drives of such tendencies. Menninger and Menninger (1936), for example, suggested that heart disease and heart symptoms may be a reflection of strong aggressive tendencies which have been repressed. They observed in coronary patients a strong emotional attachment to the father and a hostile relationship with the mother. They hypothesized that the conscious affection for the father served to deny deeply buried hostilities for him. They further speculated that if the father had symptoms of heart disease, the patients included these in their identifications with the father in order to fulfill inexpressible impulses.

The process of identification was also emphasized by Arlow (1945). He ascribed the behavior of coronary patients to an unsuccessful identification with the feared and envied parent. This was presumed to lead to a pattern of competition and compulsive striving which, for the coronary patient, failed to result in a sense of gratification or relief from anxiety. Arlow suggested that this anxiety was transformed into aggression by the coronary patient.

In one early study, Rorschach protocols of patients with various illnesses were examined. It was concluded that there was a distinctive pattern of aggressiveness as well as considerable hostility in the protocols of coronary patients (Kemple, 1945).

Although these psychodynamic interpretations were based on limited samples of selected cases and lacked careful controls, it is interesting that in the descriptions of the coronary patient the aggressive trait was consistently identified. Furthermore, these reports generated hypotheses that researchers subsequently tested.

Several later studies have verified the presence of hostile characteristics in coronary patients. Cleveland and Johnson (1962), for example, compared young male coronary patients with a noncoronary patient control group. As expected, the coronary patients expressed more hostility than the control group. In a second study, an analysis of

verbal samples collected under various interview conditions showed coronary patients to be higher than control subjects on measures of hostility-inward and ambivalent hostility (Miller, 1965). Since these studies were retrospective in design, it is not possible to conclude that there is a functional relationship between hostility and CHD. Recent prospective studies, however, provide evidence for a functional relationship between hostility and the development of CHD.

Barefoot, Dahlstrom, and Williams (1983) have recently presented findings from a study of 255 physicians who completed various measures during medical school and were followed up 25 years later. They found that individuals with high hostility scores (as measured by Cook and Medley's (1954) hostility scale) showed an incidence of CHD that was five times higher than the incidence of CHD in individuals with low hostility scores.

In a second prospective study, Shekelle, Gale, Ostfeld, and Paul (1983) report on the findings of the Western Electric Study. This was a study of 1,877 men, aged 40 to 55 years, who were employed at the Hawthorne Works of the Western Electric Company in Chicago. The men were examined in 1957 to 1958 and were reexamined annually through 1963. Follow-up for mortality continued until 1978. The researchers report that men with high hostility scores (using Cook and Medley's (1954) scale) had a higher 10 year

incidence of CHD. More specifically, the relative odds of a major CHD event (MI and CHD death) was 1.47 for men with high hostility scores compared to men with lower scores. In both of these studies (Barefoot et al., 1983; Shekelle et al., 1983) hostility was associated with mortality from all causes. Unfortunately, neither of these studies included an assessment of the TABP.

Hostility, the TABP, and CHD. Other researchers, however, have included assessments of hostility, the TABP, and CHD in their studies. Williams et al. (1980), for example, measured Type A behavior and hostility in 424 patients referred to a medical center for diagnostic coronary arteriography for suspected CHD. Type A behavior was assessed using the SI, and hostility was assessed using Cook and Medley's (1954) hostility scale. The results suggest relationships between CHD and the TABP and hostility. In particular, the researchers reported that in contrast to non-Type A patients, a greater proportion of Type A patients had at least one artery with a clinically significant occlusion of 75% or greater. In addition, only 48% of patients with low scores on the hostility scale exhibited a significant occlusion compared to 70% of the group scoring higher on the hostility scale. Multivariate analysis showed that the TABP and hostility were independently related to the presence of atherosclerosis. Furthermore, in this analysis, the hostility score emerged

as more strongly related to atherosclerosis than did the TABP.

A limitation of this study is that it was retrospective insofar as subjects were individuals suspected for CHD. The reported differences on the hostility score may have been influenced by the diagnostic process and the threat of CHD. This hypothesis is given credibility by the research suggesting that Type A and B individuals are differentially affected by perceived threats (Carver & Glass, 1978). Thus, this study does not provide unambiguous support for the relationship between hostility and the development of CHD.

In a recent study, Smith, Follick, and Korr (1984) considered the relationship between Type A behavior, anger, and variations in symptoms of angina pectoris. Their subjects were 50 patients hospitalized for diagnostic cardiac catheterization. The results showed that the frequency of anginal pains was correlated with anger. As well, the degree of perceived interference of angina was related to both Type A behavior and anger. Again, because of the correlational nature of the study, inferences cannot be made about the causal relationship between anger, the TABP, and angina.

There are several prospective studies which have examined the relationship between the TABP, hostility, and CHD. In one study, Theorell et al. (1975) followed 6,579

Swedish construction workers for a period of 12 to 15 months. As noted earlier, a "discord index" containing five items reflecting Type A behavior was administered to each subject. Several questions assessing hostility (ie. a question about hostility when held up in queues and a question about hostility when faced with slow persons) were part of the index. The results indicated that the "discord index" predicted a significant number of MIs. As well, when individual items were tested, hostility was found to predict several illnesses including MI. Due to the absence of data validating the measure of Type A behavior used, however, these findings provide only tentative support for a relationship between hostility, the TABP, and CHD.

Stronger support is provided by a study by Matthews et al. (1977). They selected a subsample of the total WCGS sample and attempted to identify the subset of factors in the SI which were related to CHD. Their sample included 62 men who had developed CHD. These coronary cases were matched to coronary-free control subjects. Factor analysis of the interview variables resulted in five primary factors. They were labelled competitive drive, past achievements, impatience, non-job achievement, and speed. Only two of these factors--competitive drive and impatience--were found to be associated with the later onset of CHD. Further analysis revealed that the individual items which accounted for the significant relationship with CHD were explosive

voice modulation, potential for hostility, vigorous answers, and irritation at waiting in lines. Based on these findings, the researchers suggest that vigor, drive, and hostility are especially important in the development of CHD.

Results from the Framingham Heart Study also suggest that hostility may be involved in the pathogenesis of CHD (Haynes et al., 1980; Haynes, Feinleib, et al., 1978; Haynes, Levine et al., 1978). A 300-item questionnaire was administered to 1,674 coronary-free men and women. Behavior type was assessed by 10 of the items which comprised the FTAS. Twelve items were included to assess anger. These questions formed four anger scales entitled anger symptoms (eg. when angry, do you get a headache, feel weak, etc.), anger-in (eg. when angry, do you keep it to yourself, apologize even though you are right, etc.), anger-out (eg. when angry, do you take it out on others, etc.), and anger-discuss (eg. when angry, do you talk to a friend, etc.). The analysis showed that suppressed hostility (ie. not showing anger) predicted CHD among white-collar men and employed women in the sample. Furthermore, the suppression of hostility and the TABP remained independent predictors of CHD incidence when included in a multivariate analysis. The researchers concluded that suppression of hostility did not explain the association of the TABP (as assessed by the FTAS) and CHD.

The findings of the Haynes et al. (1980) and the Matthews et al. (1977) studies are somewhat inconsistent. While Haynes et al. (1980) found that overt expressions of anger (ie. anger-out) did not predict the development of CHD, Matthews et al. (1977) observed that explosive voice modulation and potential for hostility were related to CHD. The differences between these findings may be accounted for by the different assessment techniques used. In the Matthews et al. (1977) study, the assessment measure was the SI, which examines the style of the responses as well as the content. In the Haynes et al. (1980) study, assessment of anger and hostility was made on the basis of a self-report measure. Three of the four items which Matthews et al. (1977) found to be related to CHD (ie. explosive voice modulation, potential for hostility, and vigor) are based on the rater's judgment of style, not on the content. It is possible that self reports of anger expression by Type A individuals are inconsistent with how others rate their behavior. This hypothesis is supported by research which suggests that Type A individuals may be largely unaware of their hostility and may distort their self-perceptions in a socially acceptable direction (Herman, Blumenthal, Black, & Chesney, 1981).

In spite of some inconsistencies in the data, it appears that hostility is important in the prediction of CHD. Yet, despite its importance, there have been few

studies examining the anger and hostility component of the TABP compared to the research assessing the time urgency and achievement striving of Type A individuals. It has been argued that the anger and hostility component needs much clarification (Matthews, 1982).

Type A and Self-Reported Anger and Hostility

Few studies have measured self-reported anger and hostility in Type A and B individuals. In one study, Dimsdale, Hackett, Block, and Hutter (1978) reported that Type A behavior was associated with self-reported anger in a sample of cardiac patients. However, since the subjects were cardiac patients who were undoubtedly affected emotionally by their illnesses, these findings cannot be generalized to a healthy population.

There are three studies which have examined the self-reports of anger and hostility among healthy Type A and B subjects. The findings of these studies, however, are somewhat inconsistent. In the first study, Francis (1981) examined changes in the affect of Type A and Type B students during a university term. On the first day of classes, 52 physical therapy students completed the JAS, the trait scale of the State-Trait Anxiety Inventory (STAI) (Spielberger, Gorsuch, & Lushene, 1981), and the trait scale of the Multiple Affect Adjective Check List (MAACL) (Zuckerman &

Lubin, 1965). On each Monday morning for 11 consecutive weeks, the state assessment questionnaires of the STAI and the MAACL were administered. In general, there were no differences in the responses of Type A and B students on the trait scales. In contrast, on the state depression, anxiety, and hostility scales of the MAACL, scores for Type A students were elevated on several testing sessions. The differences seemed to emerge at the beginning of classes, at mid-term, and at the end of term. Francis concluded that under normal conditions Type A and B individuals did not differ affectively. Type A individuals, however, were more likely to become distressed in response to academic pressures than were Type B individuals. This interpretation of the data must be regarded as tentative, as the relationship between the MAACL scores and academic pressure (eg. assignments due, exams, etc.) was not examined in the research.

In the second study, Zurawski and Houston (1983) found that following a frustration manipulation, JAS-defined Type A and B subjects did not report different levels of hostility. In this experiment, subjects competed with a confederate for a prize. To induce frustration, the confederate made obvious attempts to sabotage the subject's chances of winning. Following the manipulation, subjects completed the MAACL. The researchers found that Type A and Type B subjects had similar levels of self-reported

hostility. They attributed the failure to observe differences to the weakness of the JAS in measuring the hostility component of the TABP.

A third study, however, documented differences in the self-reported ratings of aggressiveness of SI defined Type A and Type B individuals. Chesney et al. (1981) tested a sample of 384 male subjects between the ages of 23 and 62. They found that Type A individuals described themselves as more aggressive than did Type B individuals (based on scores on the Adjective Checklist (ACL)).

Clearly there are differences between the findings of Francis (1981), Zurawski and Houston (1983), and Chesney et al. (1981). These differences may be due, in part, to the scales used to measure aggression and hostility. The aggressive adjectives on the ACL (used in the Chesney et al. study) describe an achievement-oriented person (eg. aggressive, dominant). The adjectives on the MAACL (used in the Francis, and Zurawski and Houston studies) on the other hand, tend to describe negative attitudes (eg. mean, irritated). It is possible that Type A individuals were willing to endorse adjectives which suggested that they were achievement oriented (which is socially acceptable), but were unwilling to endorse adjectives which suggested that they were mean and cruel (socially undesirable characteristics). This explanation is supported by Herman et al. (1981) who analyzed the data from the Chesney et al.

(1981) study and noted that Type A subjects tended to endorse socially acceptable descriptions of aggressiveness but did not endorse the more negative descriptors. Perhaps Type A individuals are only willing to describe themselves in hostile terms in certain circumstances (eg. when academic pressure is high).

In view of the somewhat conflicting self-report data on the anger/hostility component of the behavior pattern, more study in this area is warranted. Presumably, additional research which controls social desirability factors would demonstrate more clearly the differences in self-reported anger and hostility between Type A and Type B individuals.

Hostility and Physiological Activity

Although the exact processes involved in the development of CHD are not known, several physiological activities have been hypothesized to play a role. It has been suggested, for example, that high blood pressure (BP) and circulating catecholamines contribute to lesions in the arteries and that serum cholesterol contributes to the fibrous plaques found in atherosclerosis (Ross & Glomset, 1976a, 1976b). In an attempt to explain the link between the TABP and CHD, it has been hypothesized that Type A behaviors are accompanied by physiological activity which accelerates the development of CHD (Dembroski, MacDougall, &

Shields, 1977; Herd, 1978; Williams, Friedman, Glass, Herd, & Schneiderman, 1978). This hypothesis is supported by studies which have shown elevated levels of serum or urinary catecholamines in Type A subjects relative to Type B subjects during a normal workday (Friedman, 1978), in response to exercise on a treadmill (Simpson, Olewine, Jenkins, Ramsey, Zyzanski, Thomas, & Hames, 1974), and before, during, and after engaging in a competitive contest (Friedman, Byers, Diamant, & Rosenman, 1975). Additional research has shown that Type A subjects respond with greater BP increases compared to Type B subjects when challenged to perform at maximum capacity on various tasks (Dembroski, MacDougall, Shields, Petitto, & Lushene, 1978; Manuck, Craft, & Gold, 1978; Manuck & Garland, 1979).

Based on the findings which suggest the importance of hostility in CHD, several studies have attempted to link hostility and physiological activity. In the first study to establish such a link, Dembroski et al. (1978) hypothesized that components of the TABP most predictive of CHD should also predict challenge-induced physiological arousal. To test this hypothesis, subjects were challenged to respond rapidly and accurately to three perceptual-cognitive tasks. The correlations between components of the behavior pattern and physiological changes indicated that potential for hostility was most strongly related to systolic BP and heart rate (HR) increases.

Similar results were obtained in a study which investigated the relationship between Type A behavior, cardiovascular response, and varying levels of challenge (Dembroski, MacDougall, Herd, & Shields, 1979). A sample of 84 male college students was assessed on the SI to determine behavior type. Subjects were randomly assigned to either a high or low challenge instructional condition for both a cold pressor task and a choice reaction time task. On both tasks, Type A subjects responded with greater systolic BP and HR elevations than did Type B subjects. More importantly, when Type A subjects were divided into high and low hostility/competition subjects, the Type A high hostility/competition subjects responded with the same level of cardiovascular arousal regardless of the challenge condition, while the Type A low hostility/competition subjects showed marked arousal only under the high challenge condition. Dembroski et al. concluded that a very high level of challenge may be necessary to evoke pathophysiologic arousal in Type B individuals. In hostile and competitive Type A individuals, however, even low levels of challenge may induce such arousal, thereby increasing their risk for CHD.

A third study took a somewhat different approach to examining anger/hostility and physiological arousal. Rather than assessing hostility using a self-report measure or by conducting a component analysis of the SI, Glass, Krakoff,

Contrada, Hilton, Kehoe, Manucci, Collins, Snow, and Elting (1980) exposed Type A and B subjects to an anger and competition manipulation and monitored cardiovascular and plasma catecholamine responses. Male transit workers (classified as Type A or B based on the SI) competed on an electronic game of Super Pong with a confederate. Subjects were told that the first person to win six games would receive a \$25 gift certificate. The confederate had been trained to a level of skill that enabled him to win or lose according to a prearranged schedule. Thus, the confederate always won games two, three, four, six, eight, and nine, and therefore won the gift certificate. In the no harass condition the confederate remained silent and simply competed with the subject. In the harass condition, however, the confederate delivered a series of derogatory remarks. Heart rate, systolic and diastolic BP, and plasma epinephrine (E) and norepinephrine (NE) were monitored before, during, and after the competition.

The results showed that the presence of a hostile opponent caused no differences in the responses of Type B subjects. In Type A subjects, on the other hand, the hostile opponent elicited greater increases in systolic BP, HR, and plasma E during competition. On the basis of these findings, Glass et al. (1980) concluded that Type A subjects were more physiologically aroused by competition with a hostile opponent than were Type B subjects. A limitation of

this study is that Glass et al. did not assess the effect of the experimental manipulation on the mood of the subjects. Thus, it is not possible to state that the physiological responses reported in the study were associated with anger.

Zurawski and Houston (1983) also examined the responses of Type A and Type B subjects following a frustration manipulation. As discussed earlier, in this study subjects competed with a confederate for a prize. During the experiment, the confederate deliberately interfered with the subject's chances of winning the prize. Following this frustration manipulation, subjects completed the MAACL, and physiological measures of BP, finger pulse volume, HR, and skin resistance were recorded. The only difference observed on the physiological indices was on the skin resistance measure with Type A subjects showing more arousal than Type B subjects. It is difficult to interpret these results because the physiological measures were taken while subjects were completing the MAACL and not during the competition. The results, therefore, may have reflected different rates of recovery from arousal. It is also possible that the findings were confounded by physiological activity associated with responding to the MAACL.

In a recently published study, Diamond, Schneiderman, Schwartz, Smith, Vorp, and Pasin (1984) monitored systolic BP, diastolic BP, and HR during conditions of competition alone, or in conjunction with harassment. Type A subjects

exceeded Type B subjects in magnitude of systolic BP during the harassment condition only. Furthermore, outwardly directed anger, rated hostility on the SI, and Type A behavior were correlated with elevated systolic BP for subjects who scored high on the Buss-Durkee Hostility Inventory. Among low hostility subjects (based on the Buss-Durkee Inventory), however, suppressed anger, Type B behavior, and low hostility on the SI were associated with cardiovascular reactivity. Diamond et al. speculate that if cardiovascular reactivity is related to increased coronary risk in Type A individuals, this risk may be carried by a subset of such persons, namely those who are hostile.

When taken together, these studies suggest that hostility is associated with the physiological arousal differences of Type A and Type B individuals. Furthermore, they suggest that hostility may be especially important in identifying the physiological processes underlying the relationship between the TABP and CHD.

Behavioral Studies

In the previously reviewed studies, anger and hostility were inferred on the basis of clinical judgments, self-report, or altered physiological reactions to an anger manipulation. In this section, studies which have focused on behavioral measures of aggression among Type A and Type B

individuals will be reviewed. In one investigation, subjects engaged in discussion with a confederate in order to reach consensus on several problems. For one group of subjects, the confederate deliberately slowed down the discussion. In the second group, the confederate allowed the discussion to proceed at a normal pace. Behavioral signs of impatience and irritability were recorded (eg. tapping the table, facial annoyance) (Glass, Snyder, & Hollis, 1974). It was predicted that JAS-defined Type A subjects in the slow-down condition would show more behavioral signs of impatience and irritation than Type B subjects. Although the means for the measures of irritation were in the expected direction, with Type A subjects exhibiting more irritation than Type B subjects, the results did not reach significance.

In a second study, Carver and Glass (1978) examined interpersonal aggressive behavior. They selected 48 male undergraduate students who were defined as Type A or B based on their JAS scores. Subjects were told that they were participating in a learning experiment. The learning procedure was a modification of the Buss aggression paradigm (Buss, 1961) in which the subject was to teach the learner a concept by flashing a "correct" light for each correct response and by administering 1 of 10 increasingly painful shocks for an incorrect response. The subject was always assigned the role of teacher in the experiment, and the

learner was a confederate. In the no-instigation condition, the subject was given an explanation of the procedure after which the experimenter attached the shock electrode to the confederate's finger and told the subject to begin the learning trials. In the instigation condition, the experimenter stated that one purpose of the study was to see how learning a concept influenced subsequent teaching of another concept. Subjects were then given 3 minutes to perform a difficult perceptual-motor task. After explaining the task, the experimenter stated that he had to leave momentarily and asked the confederate to time the subject. The confederate delivered a prearranged series of denigrating remarks as the subject worked on the puzzle. Shortly thereafter, the experimenter returned and the learning task began.

In this study, the level of shock intensity delivered by the subject was taken as the index of aggression. Carver and Glass found that subjects exposed to the instigation procedure delivered shocks of higher intensity than those subjects who were not exposed to the instigation procedure. This difference in shock intensity was only found for Type A subjects, however, and the difference in the intensity of shocks delivered by Type A and Type B subjects in the instigation condition did not reach statistical significance.

Carver and Glass (1978) discussed several problems with their study. In addition to the absence of an A-B difference in shock intensity in the instigation condition, the design of the study was such that aggressiveness levels could not be clearly ascribed to the harassment the subject received. More specifically, it is possible that increased aggressiveness levels resulted solely from exposure to a difficult perceptual-motor task. Since the no-instigation subjects were not also exposed to the task, this stands as a possible interpretation of the data. In order to correct these interpretive problems, Carver and Glass (1978) conducted a second study.

Study 2 included three conditions: a no-treatment condition, a frustration-only condition in which subjects attempted the perceptual-motor task but the confederate did not make derogatory comments, and an instigation condition similar to the one used in the first study. The results indicated that Type A subjects delivered higher intensity shocks in both the frustration and instigation conditions, compared to the control condition. On the other hand, there were no significant differences in the levels of shock intensity administered by Type B subjects in the frustration or instigation conditions, compared to the control condition. Differences between Type A and Type B subjects were found in the frustration-only condition with Type A subjects being more aggressive than Type B subjects. There

were no A-B differences, however, in the control or instigation conditions. Carver and Glass concluded, therefore, that the full instigation procedure was not necessary to produce heightened aggression in Type A individuals. The frustration of being confronted with a task whose challenge could not be met resulted in nearly as much aggression among Type A subjects as did the full instigation procedure. These results suggested to Carver and Glass that the aggressive behavior of Type A individuals may represent an attempt to gain control in situations where they perceive a threat to their sense of mastery.

In another study of laboratory aggression, Van Egeren (1979) observed pairs of subjects as they interacted in a computer-controlled mixed-motive game. Sixty subjects, classified as Type A or B according to the JAS, interacted by pressing buttons which transmitted information to their partner through a television screen. Partners could cooperate, compete, reward, punish, or withdraw on each interaction. As well, between interactions they could send messages which communicated feelings, requests, and behavioral intentions. Van Egeren reports that the interactions and communications between Type A dyads and Type B dyads were strikingly different. Pairs of Type A subjects competed and punished more, cooperated and rewarded less, showed more distrust, expressed more anger, sent threatening communications, and attempted to dominate each

other more than pairs of Type B subjects. When Type A and Type B subjects interacted with each other, the differences in their behavior largely disappeared.

A major interpretive problem with both the Carver and Glass (1978) and Van Egeren (1979) studies is that the methodologies do not permit a clear distinction between hostile and instrumental motives for aggression. As Baron and Eggleston (1972) and Rule and Nesdale (1974) discuss, in the typical teacher-learner aggression paradigm (as was used in the Carver and Glass study), the subject has the opportunity to behave aggressively but at the same time, this behavior is used to assist the confederate's efforts to learn. Thus, it is impossible to determine if the subject is using punishment to hurt the learner, or is attempting to "help" the learner grasp the concept. In the Van Egeren (1979) study it is also not possible to clearly separate the motives. Although the Type A dyads sent more antisocial messages or "threats", it is difficult to determine if this aggressive behavior was part of an overall strategy to win (an instrumental motive) or was motivated by hostile intentions.

Strube, Turner, Cerro, Stevens, and Hinchey (1984) recognized these problems in the earlier research and attempted to isolate hostile motivation and instrumental motivation in Type A aggression. In the first of two studies they used a modified version of the Buss procedure

in which rewards and fines of points were used instead of shocks and a "correct" light. The subjects were divided into frustration and no-frustration conditions. The frustration manipulation consisted of being given a difficult puzzle to complete and being told that most people solve it within the allotted time. In the no-frustration condition, subjects were not given this task. Subjects were further divided into partial feedback and full feedback conditions. In the partial feedback condition, subjects were informed that the learner would be told about the level of rewards that were given, but that whenever the learner was wrong and a fine was administered, the level would not be transmitted to the learner. The learner would only know he was wrong, not how many points he had lost. Since the amount of the fine could not have any effect on the learner's progress, Strube et al. considered the level of fines in this condition to be an index of hostile aggression. In the full feedback condition, subjects were told that the learner would know immediately the level of rewards and fines administered. Thus, this condition emphasized the instrumental value of the fines, although it is still possible that hostile intentions motivated the aggression.

The data showed that in the full feedback condition there were no significant A-B differences. Frustrated Type A subjects did not exhibit more aggression when the

instrumental value of the behavior was emphasized. In contrast, in the partial feedback condition frustrated Type A subjects did administer greater fines than nonfrustrated Type A and Type B subjects, and frustrated Type B subjects. On the basis of these findings, Strube et al. concluded that the form of aggression in Type A individuals is primarily hostile. Furthermore, they suggested that the greater aggression by Type A individuals appears to be an emotional response to the loss of control.

Strube et al. provide preliminary evidence to support the loss of control-aggression hypothesis in Study II, by examining the relative prevalence of Type A and Type B women in violent and nonviolent domestic settings. They studied three groups of women: women under treatment as victims of wife abuse, women under treatment for child abuse, and a control group of women not involved in violent family situations. As expected, they found that child abusing women were more likely to be Type A while victims of wife abuse were more likely to be Type B. They suggest that when faced with a lack of controlling responses, Type A individuals may exhibit more hostility than Type B individuals. When subjected to abuse by others, the lack of control may make them less tolerant than Type B individuals (and thus more likely to terminate the relationship). Of course, since the variables of interest were not manipulated in this study, it is not known whether behavior type was a cause or consequence of abuse status.

Check and Dyck (1986) have discussed a number of problems with Strube et al.'s (1984) Study I. There was no direct measure that the Type A subjects were behaving out of a desire to hurt the confederate. In the absence of a self-report measure of motives, it is difficult to interpret the findings, especially when considering the frustration manipulation employed. The confederate, who was the recipient of the aggression, was not responsible for the prior task frustration. At the experimenter's request, the confederate merely timed the subject and asked him to stop when the allotted time had passed. Thus, it is not apparent why the subject directed the aggression towards the confederate. Check and Dyck also noted that Strube et al. used fines as the measure of aggressive behavior, rather than the more commonly used electric shock or aversive noise. In their opinion, a comparison of the use of a monetary penalty with the use of a physically aversive stimulus was needed to increase the generality of the relationships.

Check and Dyck (1986) addressed these issues in their study. They exposed Type A and B subjects (based on the JAS) to an aggression paradigm similar to that used by Strube et al. (1984). Subjects were told that the purpose of the study was to examine the effects of punishment and reward on ESP performance. Subjects were to attempt to "send" numbers to the receiver (a confederate) who was in an

adjoining room. The receiver would then guess the number. The subject could reward the receiver if the guess was correct (by giving him from one to seven nickels) or he could punish the receiver if the guess was incorrect. In the aversive noise condition, the subject could punish the receiver by administering one of seven levels of noise. In the monetary penalty condition, the subject could subtract from one to seven nickels from the receiver's "account". In both conditions subjects were told that previous research indicated that punishment had negative effects on performance. As well, rather than using a frustration manipulation as Strube et al. had done, Check and Dyck used a provocation manipulation in the form of a very negative evaluation from the confederate. Subjects received the negative evaluation immediately prior to the aggression procedure.

The results indicated that subjects were more aggressive in the aversive noise condition than in the monetary penalty condition. More importantly, Type A subjects exhibited a greater degree of hostile aggression in response to provocation than did Type B subjects. They delivered higher levels of aversive noise and larger fines to an insulting confederate, even when told that this type of punishment would interfere with performance. As well, Type A subjects reported elevated hostility and a higher desire to hurt the confederate compared to Type B subjects.

Thus, this study suggests that when exposed to an interpersonal situation in which they are provoked, Type A individuals are more likely to be aggressive than are Type B individuals. Furthermore, this aggression reflects anger and hostile intentions.

While Strube et al. (1984) suggest that hostile aggression occurs in response to a lack of control, Check and Dyck (1986) suggest a second possibility, namely that provocation is an important element in hostile aggression. While recognizing that a history of no control experiences may lower an individual's threshold for provocation (notably a Type A individual), Check and Dyck speculated that provocation may be an important stimulus in eliciting A-B differences in hostile aggression.

Several recently published studies have further examined the role of provocation in eliciting heightened aggression in Type A individuals. Baron, Russell, and Arms (1985) gave individuals scoring high (Type A), intermediate, or low (Type B) on the JAS the opportunity to aggress against a confederate who had previously either provoked or not provoked them. The provocation manipulation consisted of the confederate making comments which disparaged the subject's intelligence and ability to carry out the required procedures. The subject and confederate were told that the study was concerned with biofeedback. The subject served as the biofeedback trainer. The confederate (who was assigned

the role of learner) was to attempt to slow his heart beat. When he was successful, the subject was to illuminate a green signal light. When the confederate failed, the subject was told that he should inform him of this with a pulse of heat delivered through a cuff placed on the confederate's wrist. The subject could select the strength of the heat which varied from 1 (very low) to 10 (quite intense). The mean level of heat selected served as the measure of aggression.

Contrary to expectation, provocation increased aggression among subjects who attained moderate scores on the JAS. It failed to produce similar effects for Type B subjects and tended to reduce aggression among Type A subjects. Baron et al. attempted to explain these findings by noting that even in the absence of provocation Type A subjects directed a high level of aggression towards the confederate. They suggested that when anger was added to the situation Type A subjects may have experienced very strong tendencies to harm the confederate. These aggressive urges may have been so strong that Type A subjects consciously reduced their aggressiveness in order to avoid behaving in an inappropriate manner.

In a second study, Type A and Type B subjects (JAS-defined) were first either angered or not angered by a confederate and then were given the opportunity to reward or punish the confederate (Holmes & Will, 1985). In the first

phase of the experiment, the subject and confederate were to cooperate on an Etch-a-Sketch task. In the no-anger condition, the confederate was cooperative in his actions and supportive in his comments. In the anger condition, the confederate was uncooperative and critical. In the second phase, the subject and confederate participated in a bogus learning task. The subject (teacher) was to give the confederate (learner) feedback about his performance on analogy problems. The subject could give a small, medium, or large reward, or a small, medium, or large punishment. The reward was in the form of cash and the punishment was in the form of aversive noise.

Holmes and Will found that Type A subjects who had not been angered gave the confederate higher levels of punishment than did Type B subjects. There were no differences, however, in the levels of punishment given by Type A and Type B subjects who had been angered. They explained these findings in terms of the attributions of Type A and Type B subjects. They suggested that following the anger condition in which their performance was criticized, Type A subjects became more self-critical and hence less aggressive towards others while the reverse was true for Type B subjects. Since attributions were not assessed in this study, however, this interpretation must be regarded as tentative.

A problem with the Baron et al. (1985) and the Holmes and Will (1985) studies is their failure to clearly distinguish between instrumental and hostile motives for aggression. In both of these studies, a teacher-learner aggression paradigm was used. As noted earlier, in this type of paradigm the behavior which is taken as the measure of aggression is the same behavior which is used to help the confederate learn. Thus, it is not clear if a high score on the aggression measure reflects a desire to hurt the confederate or is an attempt to help improve the confederate's performance. Because Baron et al. (1985) and Holmes and Will (1985) did not distinguish between hostile and instrumental aggression, their findings about the effects of provocation are difficult to interpret. It is possible that the effects of provocation vary depending on the motivation for aggression. For example, if the motivation is primarily instrumental, provocation may result in a decreased concern for the performance of the learner, and hence a decrease in observed "aggression" towards the learner. When the motivation is hostile, however, provocation may heighten the aggressive behavior.

In summary, the findings regarding the role of provocation in eliciting aggression in Type As are not unequivocal. While one study (Check & Dyck, 1986) suggests that provocation is important in eliciting A-B differences in hostile aggression, other studies which have not

distinguished between hostile and instrumental motives for aggression suggest that Type A individuals do not respond differently than Type B individuals to strong provocation (Baron et al., 1985; Carver & Glass, 1978; Holmes & Will, 1985). Clearly, this is an issue that future research should address.

It should also be noted that a major limitation of the existing laboratory studies of aggression in Type A and Type B individuals is the artificial nature of the paradigm used to assess aggression. In a majority of these studies (ie. Baron et al., 1985; Carver & Glass, 1978; Check & Dyck, 1986; Holmes & Will, 1985; Strube et al., Study I, 1984) a teacher-learner aggression paradigm was used. This paradigm is inconsistent with real-life situations in several ways. First of all, the forms of aggression used in this paradigm are not frequently found in natural settings. For example, in these studies the measures of aggression included shocks, aversive noise, small monetary fines, and pulses of heat. Obviously these are not common forms of aggression. Secondly, within this paradigm subjects are physically removed from the person they aggress against (ie. the confederate) and the confederate does not have the opportunity to retaliate. Again, this is not often the case in naturally-occurring aggression where there is typically direct contact between the aggressor and the individual aggressed against and where the individual aggressed against

usually can respond to the aggression. Thus, this paradigm minimizes the interactional nature of aggression. Finally, in this paradigm the subject is placed in a role (ie. teacher) in which the use of the aggressive response is sanctioned by the experimenter. This introduces additional artificiality to the setting.

Thus, although these studies have tested various important theoretical questions, the teacher-learner paradigm introduces an artificiality to the experimental setting which makes it difficult to generalize the findings to more natural settings and forms of aggression. As Kulik and Brown (1979) suggest, there is a need for additional research which gives increased attention to studying human aggression in more realistic settings.

Purpose of the Present Study

The primary purpose of the proposed study was to examine the hostile interpersonal aggressive behavior of Type A individuals in a laboratory setting which resembles naturally occurring situations. Unlike the teacher-learner paradigm used in previous studies, the measure of aggression in this study was in the form of written aggression. The typical form of adult aggression (namely verbal aggression) (Averill, 1982) is more closely modelled by this measure than it is by physical laboratory aggression (ie. shocks,

aversive noise, and small monetary fines). As well, this study did not minimize the interactional nature of aggression. There was no physical separation between the subject and the confederate and thus the possibility for perceived retaliation was present. Finally, there was no defined role differentiation between the subject and confederate in this study. Rather, they worked as peers within the context of a cooperative problem solving situation. Clearly this is different from the teacher-learner paradigm where the subject is placed in a position of power and control over the confederate and where the use of the aggressive response is sanctioned. This study also examined if provocation is necessary to elicit hostile aggression in Type A individuals, or if frustration alone is a sufficient condition to produce A-B differences.

Of additional interest in this study was the relationship between anger expression and aggression. According to Spielberger, Johnson, Russell, Crane, Jacobs, & Worden (1985), anger expression involves the extent to which angry feelings are expressed. One aim of this study was to examine the extent to which this variable was related to behavioral aggression and to explore its moderating influence on the relationship between aggression and the TABP.

Another purpose of the research was to look at the relationship between attributions and aggression. There is

evidence which suggests that aggression increases in accordance with attributions of blame (Kulik & Brown, 1979). Also, the attributions of Type A and Type B individuals were of interest. It has been suggested that Type A individuals are more self-serving than Type B individuals in their attributions for outcomes (Strube, 1985). This study tested this hypothesis.

Finally, the relationship between assertiveness, aggression, and the TABP was explored. Initially in the study of assertiveness, researchers and clinicians focused on problems of social inhibition in the absence of assertive behaviors (Lazarus, 1966; McFall & Lillesand, 1971; McFall & Marston, 1970; Young, Rimm, & Kennedy, 1973). There is a growing body of research, however, which suggests that aggressive persons tend to be deficient in social skills and have few options in responding to provocation. That is, aggression may be facilitated by an inability to respond assertively in interpersonal conflict situations (eg. Bandura, 1973; Kirchner, Kennedy, & Draguns, 1979; Quinsey, Maguire, & Varney, 1983; Toch, 1969). Research and clinical studies which suggest that assertiveness training may be useful for individuals who show disruptive aggressive behavior lend support to this hypothesis (Foy, Eisler, & Pinkston, 1975; Rimm, Hill, Brown, & Stuart, 1974).

The relationship between assertiveness and aggression in Type A individuals has not yet been studied. Perhaps one reason for this is the lack of self-report measures of assertiveness that differentiate between individuals who are assertive and those who are aggressive. As Rimm and Masters (1974) have stated, many assertiveness inventories provide an indication that an individual will say or do something in a given situation, but this in no way ensures that the response will be assertive. In actual situations, the behavior may well be aggressive rather than assertive. Of interest in this research was the relationship between self-reported assertion and behavior following a frustration and a frustration-provocation manipulation.

It should be noted that this research was limited to studying aggression in men. In light of the different societal messages given to men and women about the appropriateness of behaving aggressively in interpersonal situations, it seems important to study aggressive behavior in men and women separately. Since previous studies of Type A behavior and aggression have used male subjects, it was decided that men would be the subjects in this study in order to permit the comparison of the findings of this study to previous research.

In summary, on the basis of the existing literature, the hypotheses for the present study were as follows:

Major hypotheses:

1. Type A subjects would demonstrate greater hostile aggression than would Type B subjects.
2. Relative to the control condition, both Type A subjects and Type B subjects would show an increase in aggression in response to frustration and a further increase in the condition which combined frustration and provocation.
3. The hypothesized A-B differences in aggression were predicted to increase in the frustration and frustration combined with provocation conditions relative to the control condition (ie. an interaction was predicted).

Secondary hypotheses:

1. In the frustration and frustration-provocation conditions, high scores on the anger expression scale would be associated with increased aggression. That is, it was predicted that individuals who indicated that they frequently express anger would be more aggressive when faced with frustration and provocation.
2. Attributions of blame to the confederate for "failure" would be higher among Type A subjects than among Type B subjects, and such attributions would be associated with increased aggressiveness in each condition.

3. In spite of the acknowledged limitations of the self-report measures of assertiveness, it was predicted that for each condition, increased assertiveness would be associated with a decrease in aggression.

METHOD

Overview

The purpose of this study was to evaluate A-B differences in hostile aggression in a laboratory setting which resembles real-life interactions. The subjects experienced failure, with or without provocation by a confederate, in the context of a series of cooperative problem solving tasks. Following this experience, they had the opportunity to endorse one of a number of written statements (feedback scripts), which varied in the level of expressed aggression and hostility, and present it to the confederate. Of interest in the study was whether frustration alone is sufficient to elicit A-B differences in aggression or if interpersonal provocation is necessary. The study was a 2 (Behavior type: A or B) x 3 (Condition: control, frustration, or frustration and provocation) factorial design. The independent variables were behavior type and condition, and the dependent variable was aggression. Aggressiveness was assessed by examining which feedback script subjects selected to give to the confederate. Self-reported assertiveness, anger expression, affect, attributions for performance, subjects' perceptions

of the confederate, and the confederate's perceptions of the subjects were also assessed.

Subjects

The subjects were male undergraduate psychology students. They were selected from a group of students who completed various prescreening measures (including the JAS-T) at the beginning of the school year. Subjects classified as Type A or B on the basis of the prescreening were asked to participate in two experiments. The first experiment consisted of the experiment proper. In the second experiment the Structured Interview was administered and subjects completed various questionnaires. Subjects received two experimental credits for participating in the research.

One hundred and thirteen subjects participated in this study. Based on their responses to the Post-Experimental Questionnaire, subjects were divided into two categories: those who were suspicious of the experimental manipulation ($n = 23$) and those who were not ($n = 90$). Preliminary analyses were done for the Frustration-Provocation Condition using 2 (Behavior Type) x 2 (Suspiciousness) ANOVAs on the mood measures. The findings showed an effect for Suspiciousness on the reported changes in anxiety and hostility. This suggested that the experimental

manipulations were not as effective on suspicious subjects. A summary of the findings are presented in Appendix A. As a result of the small number of suspicious subjects in the Frustration Condition ($n = 8$), a similar analysis was not done. However, the means for the changes in anxiety, depression, hostility, and anger suggest the same pattern, namely that the manipulations were not as effective for suspicious subjects. The means for the mood change scores are given in Appendix B. In light of these findings, suspicious subjects were not included in the final sample.

Materials

Jenkins Activity Survey Form T. Subjects were classified as Type A or Type B using the Jenkins Activity Survey Form T (JAS-T). The JAS-T is a self-report measure of the TABP adapted from the JAS (Jenkins et al., 1974) for use with university students (Glass, 1977) (see Appendix C). This 44 item scale yields an overall Type A score based on unit weightings of 21 items. Test-retest reliabilities (over more than a one year period) of .60 to .70 have been reported for the JAS (Jenkins, 1978). The construct validity of the JAS as an assessment technique has been supported by social psychological research which has demonstrated that JAS-defined Type A subjects are more time-urgent, impatient, and hard-driving than Type B subjects when appropriate environmental challenges are made salient

(Glass, 1977). Because of the similarity to the adult version of the JAS, little effort has been made to collect psychometric data on the JAS-T. In one report of test-retest reliability it is stated that following an interval of two weeks to four months, JAS-T scores changed from a Type A to a Type B classification or vice versa in only 9% of 83 cases (Glass, 1977).

In this research, students who scored eight or above on the A-B scale were classified as Type A, while students scoring five or below were classified as Type B. Subjects defined as either Type A or Type B on the basis of the JAS-T (administered in a prescreening session) were asked to participate in the research.

The Structured Interview. The student form of the structured interview (SI) was used to further assess Type A behavior (Rosenman, 1978). The student form of the SI consists of 22 questions containing competitive, hostile, and time urgent themes (see Appendix D). Both the content of the answers and the style of responding form the basis of the categorization. The degree of interrater agreement for the SI ranges from 76% to 88% (Jenkins, 1978). As for test-retest reliability, 80% of the men in the WCGS received consistent classifications over a period of 12 to 20 months (Rosenman, 1978).

The interviewer in this study was trained in the administration of the SI by Dr. D. Dyck, who was trained by Rosenman and associates. The interviews were recorded and subsequently rated by the experimenter, according to the scoring system developed by Rosenman and associates. Subjects were classified as one of five types: A-1, A-2, X, B-3, or B-4. Type A-1 represents an individual who is characterized by extremes of time urgent, hostile, and competitive behaviors. The Type A-2 individual is similar to the Type A-1 individual except that she or he exhibits fewer behaviors classified as Type A. Similarly, Type B-4 individuals demonstrate fully developed Type B behaviors, while Type B-3 individuals exhibit fewer Type B behaviors. Individuals classified as X exhibit both Type A and Type B behaviors. For the purposes of this experiment, Type A-1 and Type A-2 subjects were categorized as Type A, and Type B-3 and Type B-4 subjects were categorized as Type B. Interrater reliability was based on a randomly selected sample of 28 subjects. The ratings (made by the experimenter and Dr. Dyck) were consistent for 86% of the cases. The agreements exceeded chance levels ($Kappa = .72$, $\underline{z} = 3.87$, $\underline{p} < .05$, Cohen, 1960).

The Multiple Affect Adjective Check List. The state form of the Multiple Affect Adjective Check List (MAACL) was used to check on the effectiveness of the frustration and provocation procedures. The MAACL is an inventory of 132

adjectives which subjects rate as descriptive of general feelings (general form) or current feelings (today/state form) (see Appendix E). The MAACL yields scores on three subscales: hostility, anxiety, and depression. The internal reliability of the state form for university students ranges between .79 and .92 (Zuckerman & Lubin, 1965). Evidence for the validity of the MAACL comes from studies which show that students' scores on the subscales of the MAACL were elevated on days of exams and that the anxiety scores of actors and actresses were elevated prior to their performances. Further evidence for the validity of the MAACL comes from reports that the scores on the anxiety and depression subscales are related to clinical ratings of anxiety and depression and that the anxiety subscale is correlated with various tests of anxiety (Zuckerman & Lubin, 1965).

State-Trait Anger Scale. The state form of the State-Trait Anger Scale (STAS) was also used to check the effectiveness of the manipulations. The State Anger Scale is comprised of 10 items consistent with the emotional state of anger (see Appendix F). In response to the items (eg. "I am furious"), subjects are asked to rate the intensity of their feelings "right now" on a four-point scale. The internal consistency of the state anger scale for college students is reported to be .95 (Spielberger, Jacobs, Russell, & Crane, 1983).

Attribution Questionnaire. Following the completion of the tasks, subjects were asked to complete a questionnaire which assessed their attributions for their performance. For example, they were asked to indicate the extent to which they attributed their performance on the tasks to their ability, their attitude toward the task, their effort, their partner's ability, their partner's attitude toward the task, their partner's effort, and the difficulty of the task (see Appendix G).

Ratings of the Confederate/Subject. Subjects were asked to rate their partner (the confederate) on the extent to which they perceived him as friendly, likeable, intelligent, incompetent, hostile, etc. (see Appendix H). The confederate also rated the subjects along these dimensions.

Feedback Scripts. Subjects were given the opportunity to provide written feedback to their partner. They were given three feedback scripts from which they selected one. The scripts varied in aggressive content (see Appendix I). To verify that the scripts differed, prior to their inclusion in the research the scripts were assessed by a group of raters on the degree to which they contained aggressive content. A repeated measures ANOVA on the ratings found a significant effect for aggression ($F(2,58) = 111.85, p < .05$). A comparison of the means indicated

that there was a difference in the ratings of aggressiveness for the three scripts. As well, a test for trend indicated that there was a linear trend in the data.

Post-Experimental Questionnaire. At the end of the experiment, subjects were asked to indicate if they were suspicious about any aspect of the experiment. They were also asked to explain what they were suspicious about and why (see Appendix J).

Tasks. During the experiment proper, subjects were paired with a confederate and engaged in a series of tasks. The subject and confederate were told that they would work as a team and that they should try to complete as many problems as possible in the allotted time. There were three separate tasks:

Task 1. In the first task, the subject and confederate had five minutes to produce as many different words as possible from the letters of the word "GENERATION". They were told that the words they produced must be words found in English dictionaries. A similar task using this test word has been used in a previous study of cooperation and competition (Deutsch & Leong, 1983).

Task 2. The second task consisted of a series of mathematical problems. Math problems have been used in past research on cooperation (eg. Kumar & Kaur, 1976; Tjosvold, Johnson, & Johnson, 1981). The problems used in this study

involved simple mathematical operations (eg. "A man goes shopping and buys a litre of milk (\$.97), a bag of apples (\$1.92), and a loaf of bread (\$.49). How much change will he get from \$5.00?"). The subject and confederate worked together on the problems to complete as many as possible in five minutes.

Task 3. The final task involved a list of anagrams that the subject and confederate attempted to solve (eg. LRMAA, CRAIH). They were given five minutes to solve as many of the anagrams as they could.

Assertion Inventory. The Assertion Inventory (AI) was used to measure assertiveness in the present study. The AI is a 40 item self-report questionnaire of assertive behaviors (Gambrill & Richey, 1975). The 40 items sample the following: turning down requests, expressing personal limitations, initiating social contacts, expressing positive feelings, handling criticism, differing with others, assertion in service situations, and giving negative feedback (see Appendix K). For each item, the subject is requested to indicate the degree of discomfort or anxiety in specific situations, the probability of displaying the behavior if actually presented with the situation, and the situations in which the individual would like to be more assertive.

There is evidence suggesting that the AI is a reliable measure. Test-retest reliability for the AI over a five week period was .87 for the discomfort measure and .81 for response probability. As well, discomfort scores discriminated an unassertive group of women from students enrolled in social science classes, thereby suggesting a degree of validity to the measure. A reduction in discomfort scores following a program of assertiveness training provides additional evidence for the validity of the instrument (Gambrill & Richey, 1975).

Anger Expression Scale. The Anger Expression Scale (AX) is a 20 item self-report measure which asks subjects to rate how often they feel or act in the stated manner when they are angry or furious (Spielberger et al., 1985) (see Appendix L). Some of the AX items are worded in such a way that a high rating indicates that anger is frequently expressed (eg. "I do things like slam doors"). Other items are worded in such a way that a high rating indicates that anger is not often expressed (eg. "I withdraw from people"). The AX yields three scores: an Anger Expression score based on all 20 items, an Anger-In score based on 8 items, and an Anger-Out score based on 8 items.

Procedure

Male undergraduate students who had been classified as Type A or Type B on the basis of the JAS-T (administered in a prescreening session) were recruited to participate in two experiments. They were told that the research required that they come to the laboratory on two separate occasions and that they would receive two experimental credits when they had completed both experiments. The confederate and the experimenters were blind to the classification of the subjects based on the JAS-T.

When the subject arrived for the first part of the experiment he was introduced to another student (a male confederate) by a male experimenter. The subject and confederate were told that the purpose of the research was to investigate the relationship between interpersonal style and joint problem solving. Hence, they would be asked to work with each other on a variety of tasks. The experimenter informed them that prior to beginning the tasks he must collect data on their current feelings. The subject and confederate were then given the MAACL (state form) and the State Anger Scale. When the subject and confederate completed these measures the series of tasks began.

The subject and confederate were told that the three tasks are commonly used in measuring various aspects of intelligence. They were also told that they would work as a

team and that they should try and complete as many problems as possible in the allotted time. Prior to beginning each task, the task was explained and any questions about the instructions were answered.

Within the experiment proper, subjects were assigned to one of the following three conditions:

Control Condition. In the control condition the confederate cooperated with the subject as they worked on the various tasks. That is, he was well engaged in the tasks and contributed to their solution. At the end of the allotted time for each task, the score for the pair was calculated (ie. the number of words produced, the number of math problems successfully solved, or the number of anagrams solved). The subject and confederate were not, however, given feedback about their performance relative to other pairs of subjects.

Frustration Condition. As in the control condition, the confederate was well engaged in the tasks and contributed to the solutions. At the end of the time given for each task, the experimenter calculated the score for the pair. There was a series of graphs on a wall of the research room on which the performance of previous pairs of subjects was recorded. After determining the score of the subject and confederate, the experimenter went to the graphs and recorded the score. The graphs indicated that, in

general, other subjects had performed extremely well on the tasks. The performance of the subject and confederate appeared poor in comparison.

In order to make the failure manipulation salient, as the experimenter recorded their scores the confederate asked him what he was doing. He also urged the subject to observe the graphs with him and to assess how they have done relative to other subjects.

Frustration-Provocation Condition. Although the confederate in this condition engaged in the tasks and contributed to the solutions, during the experiment he made a predetermined number of derogatory comments to the subject. He questioned the ability of the subject, expressed doubts that they would work well together, and blamed their poor performance on the subject. More specifically, the confederate made the following statements during the experiment:

1. I don't know how well we will do. He doesn't seem to be the kind of person that is easy to work with.
2. Come on, you're not doing your share of the work!
3. You aren't very good at math are you?
4. I certainly hope you are better at this task!
5. Why don't you try harder?
6. I'm sure I could have done better with a different partner.

As in the frustration condition, after calculating their score on each task, the experimenter recorded the score on a graph. The confederate encouraged the subject to note that their performance was poor in comparison to other subjects.

When the three tasks were completed, the subject and confederate were asked to complete several questionnaires. The questionnaires included the MAACL, the State Anger Scale, the attribution questionnaire, and the questionnaire asking them to rate their partner on various dimensions. In addition to rating the subjects on the dimensions stated on the questionnaire, the confederate also rated the subjects on anger and aggressive dimensions. Then subjects had the opportunity to give their partner written feedback about their behavior. In the written instructions given to the subject and the confederate it was stated that previous research has shown that positive feedback can enhance a person's self-esteem and subsequent performance, while negative feedback decreases a person's self-esteem and interferes with his or her subsequent performance. The subject and confederate were asked to select one of the three letters, to endorse it by addressing it to their partner and by signing their name, to place the letter in an envelope, and to discard unused letters. They were told that the letters would be exchanged at the end of the experiment. When subjects had made their selection, the experimenter stated that he was interested in the subjects'

perceptions of the letters. The subjects were asked to rate the letters on the extent to which they were aggressive, assertive, and socially acceptable. When subjects had completed these tasks, they were given a short post-experimental questionnaire to assess their suspicions about the research. Finally, subjects were provided with a debriefing script in which all the deceptions involved in the experiment were explained (see Appendix M). As well, the experimenter answered any questions that the subjects had. Before leaving the laboratory the subject made an appointment to participate in the second experiment. The second experiment was conducted between one and two weeks after the subject completed the first experiment.

Upon arriving at the laboratory for the second experiment, the experimenter (who was not the experimenter from the first experiment) told the subject that she was collecting data on various attitudes and behaviors of university students. The experimenter then administered the SI. Following the administration of the SI, the subject was asked to complete the AI and the AX. The subject was debriefed and given two experimental credits for participating in the research.

RESULTS

The results that follow are based on the final sample of 90 subjects. Based on the JAS, there were 45 Type A subjects and 45 Type B subjects in the final sample. There were 51 Type A subjects and 35 Type B subjects as assessed by the SI. Four subjects were rated as Type X and were not included in analyses using the SI classification system. Consistent with previous research (eg. Jenkins, 1978), there was 70% agreement between the JAS and the SI methods of classification. Nine JAS-defined Type A subjects were rated as Type B based on the SI, while 17 JAS-defined Type B subjects were categorized as Type A on the SI.

The results will be divided into several sections. Firstly, the analyses involving behavior type as an independent variable will be presented. These will include the analyses testing the effects of the manipulations and behavior type on self-reported mood, hostile aggression, perceptions of the scripts, ratings of the confederate and the subject, attributions, and anger expression. These findings will be presented separately for JAS-defined Type A behavior and SI-defined Type A behavior. Secondly, correlational analyses involving attributions, anger expression, and assertiveness will be reported. Finally,

the association between the aggression measure and a number of variables will be evaluated by regression analyses. It should be noted that Dunn's (1961) procedure ($\alpha = .05$) was used in the analysis to clarify significant analyses of variance. This procedure controls the error rate for a collection of tests by dividing the level of significance among the comparisons (Kirk, 1968).

JAS-Defined Type A Behavior

Self-Reported Mood. To determine the effectiveness of the experimental manipulations, 2 (Behavior Type) x 3 (Condition) ANOVAs were applied to the changes in anxiety, depression, and hostility as measured by the MAACL. These change scores were calculated by subtracting the score at baseline from the scores following the experimental manipulations. The analysis revealed a main effect for Condition on the anxiety change scores ($F(2,84) = 8.06, p = .0006$). Subjects in the Frustration-Provocation Condition reported a greater increase in anxiety (Mean = 2.93) than did subjects in the Frustration Condition (Mean = .83) and the Control Condition (Mean = .07). Similarly, there was a main effect for Condition on the depression change scores ($F(2,84) = 5.03, p = .009$), with a greater increase in depression being reported by subjects in the Frustration-Provocation Condition (Mean = 4.10) than by subjects in the Control Condition (Mean = .90). Depression change scores in

the Frustration Condition (Mean = 1.50) were not significantly different from those in the other conditions. The 2 (Behavior Type) x 3 (Condition) ANOVA with change in hostility level as the dependent variable also revealed a main effect for Condition ($F(2,84) = 11.77, p = .0001$). Subjects in the Frustration-Provocation Condition reported a greater increase in hostility (Mean = 5.23) than did subjects in the Frustration Condition (Mean = 2.17) and the Control Condition (Mean = .97). There were no differences between Type A and Type B subjects on these three measures.

To further assess the effectiveness of the experimental manipulation a 2 (Behavior Type) x 3 (Condition) ANOVA was performed on the change in self-reported anger based on the State Anger Scale (ie. the anger score at baseline subtracted from the anger score following the manipulations). This analysis showed a main effect for Condition ($F(2,83) = 10.58, p = .0001$), with subjects in the Frustration-Provocation Condition (Mean = 4.83) reporting a greater increase in anger than subjects in the Frustration Condition (Mean = 1.48) and the Control Condition (Mean = -.13). There were no differences between Type A and Type B subjects on self-reported anger.

In summary, on the MAACL and the State Anger Scale subjects in the Frustration-Provocation Condition reported greater increases in anxiety, hostility, and anger following the manipulations than did subjects in the Frustration and

Control Conditions. They also reported a greater increase in depression than subjects in the Control Condition. There were no differences between Type A and Type B subjects on these mood change measures.

Type A Behavior and Hostile Aggression. The major hypotheses were tested using a 2 (Behavior Type) x 3 (Condition) ANOVA with hostile aggression as the dependent variable. Aggression was measured by the feedback letter chosen by the subjects to present to the confederate. The feedback letters were coded 1 (low aggression), 2 (medium aggression), and 3 (high aggression) and entered into the analysis. The results showed a main effect for Condition ($F(2,84) = 73.26, p = .0001$). Subjects in the Frustration-Provocation Condition demonstrated greater hostile aggression towards the confederate (Mean = 2.00) than did subjects in both the Frustration Condition (Mean = 1.00) and the Control Condition (Mean = 1.00). There were no effects for Behavior Type on the measure of hostile aggression.

Perception of the Scripts. A 2 (Behavior Type) x 3 (Condition) repeated measures ANOVA was applied to the subjects' perceptions of the aggressiveness of the content of the feedback scripts. There was a main effect of Aggressiveness ($F(2,168) = 234.24, p = .0001$) with subjects rating the third script as more aggressive (Mean = 6.67) than the second script (Mean = 4.99). The first

script was rated as the least aggressive in content (Mean = 2.69). There were no effects of Condition or Behavior Type on the ratings of the scripts.

Rating of the Confederate. Following the tasks, subjects were asked to rate the confederate along various dimensions. These ratings were analyzed using 2 (Behavior Type) x 3 (Condition) ANOVAs. There was a main effect for Condition on the overall rating of the confederate (based on the combination of ratings on the individual items) ($F(2,84) = 98.35, p = .0001$). Subjects in the Control Condition (Mean = 60.07) and the Frustration Condition (Mean = 57.90) rated the confederate more positively than did subjects in the Frustration-Provocation Condition (Mean = 35.30). No A-B differences were found.

In addition to examining the overall rating of the confederate, separate ANOVAs were performed on the individual items which comprised the rating scale. These analyses revealed an effect for Condition when the dependent variable was Friendly, Interesting, Boring, Likeable, Impatient, Unsociable, Incompetent, Cooperative, Considerate, and Hostile. The F statistics for these analyses can be found in Table 1.

Insert Table 1 about here

Table 1

Summary of Condition x JAS Analyses of Variance
on Ratings of the Confederate

<u>DIMENSIONS</u>	<u>EFFECTS</u>	<u>df</u>	<u>F</u>
FRIENDLY	Condition	2,84	97.43***
	JAS	1,84	.01
	Condition x JAS	2,84	.99
INTERESTING	Condition	2,84	8.53***
	JAS	1,84	.48
	Condition x JAS	2,84	.36
BORING	Condition	2,84	9.96***
	JAS	1,84	1.19
	Condition x JAS	2,84	.76
LIKEABLE	Condition	2,84	82.33***
	JAS	1,84	1.48
	Condition x JAS	2,84	.69
IMPATIENT	Condition	2,84	30.08***
	JAS	1,84	.00
	Condition x JAS	2,84	.37
UNSOCIABLE	Condition	2,84	27.51***
	JAS	1,84	.07
	Condition x JAS	2,84	.14
INCOMPETENT	Condition	2,84	19.59***
	JAS	1,84	.04
	Condition x JAS	2,84	.28
COOPERATIVE	Condition	2,84	35.56***
	JAS	1,84	.44
	Condition x JAS	2,84	1.24

Table 1 (continued)

<u>DIMENSIONS</u>	<u>EFFECTS</u>	<u>df</u>	<u>F</u>
CONSIDERATE	Condition	2,84	68.78***
	JAS	1,84	.07
	Condition x JAS	2,84	.61
HOSTILE	Condition	2,84	38.72***
	JAS	1,84	.59
	Condition x JAS	2,84	.20

*** $p < .001$

Post hoc tests showed that subjects in the Frustration-Provocation Condition rated the confederate as less friendly, interesting, likeable, cooperative, and considerate than did subjects in the Frustration Condition and the Control Condition. As well, the subjects rated the confederate as more boring, impatient, incompetent, unsociable, and hostile than did subjects in the Frustration and Control Conditions. The means for each condition are presented in Table 2.

Insert Table 2 about here

There were no differences between Type A subjects and Type B subjects on how the confederate was rated.

Rating of the Subject. The ratings of the subject by the confederate were also analyzed using 2 (Behavior Type) x 3 (Condition) ANOVAs. The analysis resulted in a main effect for Condition on the overall rating of the subject (based on the combination of the individual items) ($F(2,84) = 5.52, p = .006$). The confederate rated subjects in the Control Condition (Mean = 54.23) more positively than subjects in the Frustration-Provocation Condition (Mean = 49.27). Ratings of subjects in the Frustration Condition (Mean = 51.80) did not differ from the other Conditions.

There was also a main effect for Condition on the following dimensions: Friendly, Boring, Impatient, Cooperative, Considerate, and Hostile (see Table 3).

Table 2

Mean Ratings (with Standard Deviations) of the Confederate
by Condition

<u>ITEM</u>	<u>CONDITION</u>		
	<u>CONTROL</u>	<u>FRUSTRATION</u>	<u>FRUSTRATION- PROVOCATION</u>
FRIENDLY	5.63 (0.96)	5.47 (0.82)	2.20 (1.35)
INTERESTING	5.50 (0.73)	5.27 (0.69)	4.57 (1.19)
BORING	2.17 (1.18)	2.37 (1.38)	3.70 (1.73)
LIKEABLE	5.47 (0.97)	5.47 (1.04)	2.23 (1.33)
IMPATIENT	1.60 (0.86)	2.10 (1.06)	4.43 (2.19)
UNSOCIABLE	1.77 (1.17)	1.87 (1.25)	4.43 (2.08)
INCOMPETENT	1.37 (0.85)	1.87 (0.97)	3.10 (1.37)
COOPERATIVE	5.83 (1.53)	5.77 (0.90)	3.10 (1.73)
CONSIDERATE	5.67 (0.92)	5.50 (0.94)	2.53 (1.50)
HOSTILE	1.13 (0.43)	1.37 (0.61)	3.67 (1.97)

Insert Table 3 about here

The confederate rated subjects in the Frustration-Provocation Condition as less friendly, less cooperative, and more hostile than subjects in the Control Condition and the Frustration Condition. As well, subjects in the Frustration-Provocation Condition were rated as less boring than subjects in the Frustration Condition and as less considerate than subjects in the Control Condition. Post hoc analyses did not reveal differences in the mean ratings of impatience. The means for these ratings are presented in Table 4.

Insert Table 4 about here

The analysis also showed a main effect for Behavior Type on the items assessing the extent to which the subject was interesting ($F(1,84) = 4.61, p = .035$) and impatient ($F(1,84) = 4.18, p = .044$). Type A subjects were rated as more interesting (Mean = 4.24) than Type B subjects (Mean = 3.91). As well, Type A subjects were rated as more impatient (Mean = 2.44) than Type B subjects (Mean = 1.91).

In addition to the rating scale, the confederate rated the subjects on anger and aggression dimensions. The 2 (Behavior Type) x 3 (Condition) ANOVAs resulted in a

Table 3

Summary of Condition x JAS Analyses of Variance
on Ratings of the Subject

<u>DIMENSIONS</u>	<u>EFFECTS</u>	<u>df</u>	<u>F</u>
FRIENDLY	Condition	2,84	7.05**
	JAS	1,84	2.73
	Condition x JAS	2,84	1.28
INTERESTING	Condition	2,84	1.00
	JAS	1,84	4.61*
	Condition x JAS	2,84	1.17
BORING	Condition	2,84	3.20*
	JAS	1,84	.10
	Condition x JAS	2,84	1.54
LIKEABLE	Condition	2,84	2.56
	JAS	1,84	2.19
	Condition x JAS	2,84	1.35
IMPATIENT	Condition	2,84	3.19*
	JAS	1,84	4.18*
	Condition x JAS	2,84	.81
UNSOCIABLE	Condition	2,84	.71
	JAS	1,84	.07
	Condition x JAS	2,84	.07
INCOMPETENT	Condition	2,84	2.37
	JAS	1,84	.58
	Condition x JAS	2,84	.05
COOPERATIVE	Condition	2,84	14.03***
	JAS	1,84	1.86
	Condition x JAS	2,84	1.29

Table 3 (continued)

<u>DIMENSIONS</u>	<u>EFFECTS</u>	<u>df</u>	<u>F</u>
CONSIDERATE	Condition	2,84	5.81**
	JAS	1,84	.80
	Condition x JAS	2,84	1.98
HOSTILE	Condition	2,84	9.72***
	JAS	1,84	.34
	Condition x JAS	2,84	.10

* $p < .05$

** $p < .005$

*** $p < .001$

Table 4

Mean Ratings (with Standard Deviations) of the Subjects
by the Confederate as a function of Condition

<u>ITEM</u>	<u>CONDITION</u>		
	<u>CONTROL</u>	<u>FRUSTRATION</u>	<u>FRUSTRATION- PROVOCATION</u>
FRIENDLY	4.80 (1.27)	4.50 (1.36)	3.67 (1.03)
BORING	1.90 (0.76)	2.13 (0.63)	1.70 (0.60)
IMPATIENT	1.87 (1.20)	2.63 (1.43)	2.03 (1.13)
COOPERATIVE	5.10 (1.42)	4.83 (1.56)	3.33 (1.21)
CONSIDERATE	4.73 (1.17)	4.23 (0.86)	3.80 (1.16)
HOSTILE	1.07 (0.25)	1.37 (0.76)	2.07 (1.31)

significant effect for Condition on both anger ($F(2,84) = 33.86, p = .0001$) and aggression ($F(2,84) = 5.24, p = .007$). Subjects in the Frustration-Provocation Condition were rated as more angry (Mean = 2.67) than were subjects in the Frustration Condition (Mean = 1.40) and the Control Condition (Mean = 1.03). As well, subjects in the Frustration-Provocation Condition were rated as more aggressive (Mean = 2.00) than subjects in the Control Condition (Mean = 1.20). There were no A-B differences on the ratings of the subjects' anger and aggression.

Type A Behavior and Attributions. The attributions of the subjects were analyzed with 2 (Behavior Type) x 3 (Condition) ANOVAs. There was an effect for Condition on the extent to which the subjects' performance met their expectations ($F(2,84) = 4.52, p = .014$). Subjects in the Control Condition rated their performance relative to their expectations as higher (Mean = 4.50) than did subjects in the Frustration Condition (Mean = 3.47). The mean rating by subjects in the Frustration-Provocation Condition (Mean = 3.63) did not differ from the ratings of subjects in the other conditions. There was also an effect for Condition on the extent to which subjects attributed their performance to their partner's ability ($F(2,84) = 4.66, p = .012$), their partner's attitude ($F(2,83) = 7.37, p = .001$), and luck ($F(2,84) = 4.57, p = .013$). Subjects in the Frustration-Provocation Condition attributed their performance to their

partner's ability (Mean = 5.00) and their partner's attitude (Mean = 5.10) to a greater extent than did subjects in the Frustration Condition (Mean for Partner's Ability = 4.33; Mean for Partner's Attitude = 3.90). As well, subjects in the Frustration Condition made greater attributions for their performance to luck (Mean = 2.67) than did subjects in the Frustration-Provocation Condition (Mean = 1.80).

There was also one analysis that resulted in an effect for Behavior Type. This was the ANOVA with Difficulty of the Task as the dependent variable ($F(1,84) = 5.49, p = .022$). Type B subjects attributed their performance to the difficulty of the task to a greater extent (Mean = 4.62) than did Type A subjects (Mean = 3.91).

Type A Behavior, Anger Expression, and Hostile Aggression. The relationship between behavior type, anger expression, and hostile aggression was examined using a 2 (Behavior Type) x 3 (Condition) x 2 (Anger Expression) ANOVA with a median split performed on the Anger Expression scores to divide the sample into two groups: high anger expression subjects and low anger expression subjects. This analysis resulted in a main effect for Condition ($F(2,78) = 85.55, p = .0001$). As discussed earlier, subjects in the Frustration-Provocation Condition exhibited greater hostile aggression (Mean = 2.00) than did subjects in the Frustration Condition (Mean = 1.00) and the Control Condition (Mean = 1.00). The ANOVA also indicated a main

effect for Anger Expression ($F(1,78) = 4.89, p = .030$). Low anger expression subjects showed greater greater hostile aggression (Mean = 1.40) than did high anger expression subjects (Mean = 1.27). These main effects were qualified by a significant interaction between Condition and Anger Expression ($F(2,78) = 5.01, p = .009$). Although the scores on the hostile aggression measure were the same in the Control and Frustration Conditions, in the Frustration-Provocation Condition subjects who scored low on Anger Expression exhibited greater hostile aggression (Mean = 2.29) than did subjects who scored high on Anger Expression (Mean = 1.75). There were no effects for behavior type on hostile aggression.

A 2 (Behavior Type) x 3 (Condition) x 2 (Anger-In) ANOVA was also performed using a median split on the Anger-In measure. This analysis resulted in main effects for Condition ($F(2,78) = 98.93, p = .0001$) and for Anger-In ($F(1,78) = 8.13, p = .006$) on hostile aggression. That is, there was an increase in hostile aggression in the Frustration-Provocation Condition (Mean = 2.00) relative to the Frustration Condition (Mean = 1.00) and the Control Condition (Mean = 1.00). As well, subjects who scored high on the Anger-In scale showed greater hostile aggression (Mean = 1.45) than did subjects who scored low on the Anger-In scale (Mean = 1.23). There was also a Condition by Anger-In interaction ($F(2,78) = 10.61, p = .0001$). This

interaction showed that while there were no differences in hostile aggression between high anger-in subjects and low anger-in subjects in the Frustration and Control Conditions, in the Frustration-Provocation Condition high anger-in subjects exhibited greater hostile aggression (Mean = 2.36) than did low anger-in subjects (Mean = 1.69). The ANOVA also showed a Condition by Behavior Type by Anger-In interaction ($F(2,78) = 3.49, p = .035$). In the Frustration-Provocation Condition, Type A subjects who scored low on the Anger-In scale showed less hostile aggression (Mean = 1.38) than did low anger-in Type B subjects (Mean = 2.00), high anger-in Type B subjects (Mean = 2.29), and high anger-in Type A subjects (Mean = 2.43). There was also a difference between low anger-in Type B subjects (Mean = 2.00) and high anger-in Type A subjects (Mean = 2.43) in this condition. There were no differences between these groups in the Control and Frustration Conditions.

A 2 (Behavior Type) x 3 (Condition) x 2 (Anger-Out) ANOVA on hostile aggression was also done using a median split on the Anger-Out subscale of the Anger Expression scale. The analysis resulted in a main effect for Condition ($F(2,78) = 64.27, p = .0001$). Subjects in the Frustration-Provocation Condition showed greater hostile aggression (Mean = 2.00) than did subjects in the Frustration Condition (Mean = 1.00) and the Control

Condition (Mean = 1.00). The Condition by Anger-Out interaction approached significance ($F(2,78) = 2.91, p = .060$). The means suggested a tendency for low anger-out subjects in the Frustration-Provocation Condition to show greater hostile aggression (Mean = 2.16) than high anger-out subjects in this condition (Mean = 1.73). No effects for Behavior Type were found in the analysis.

SI-Defined Type A Behavior

Self-Reported Mood. The effectiveness of the experimental manipulations was tested by 2 (Behavior Type) x 3 (Condition) ANOVAs on changes in self-reported mood as measured by the MAACL. These analyses showed a main effect for Condition on anxiety change scores ($F(2,80) = 7.45, p = .001$), depression change scores ($F(2,80) = 3.61, p = .032$), and hostility change scores ($F(2,80) = 8.96, p = .0003$). Subjects in the Frustration-Provocation Condition reported a greater increase in anxiety (Mean = 2.96) and hostility (Mean = 4.88) than did subjects in the Frustration Condition (Mean anxiety change score = .83; Mean hostility change score = 2.17) and the Control Condition (Mean anxiety change score = .07; Mean hostility change score = .97). A greater increase in depression was shown by subjects in the Frustration-Provocation Condition (Mean = 3.85) than by subjects in the Control Condition (Mean = .90). Depression change scores for subjects in the Frustration Condition

(Mean = 1.50) were not significantly different than the scores in the other conditions. As in the JAS analysis, there were no A-B differences on these measures.

The 2 (Behavior Type) x 3 (Condition) ANOVA on the change in self-reported anger (based on the State Anger Scale) also showed a main effect for Condition ($F(2,79) = 8.52, p = .0004$). Subjects in the Frustration-Provocation Condition showed a greater increase in anger (Mean = 4.73) than did subjects in the Frustration Condition (Mean = 1.48) and the Control Condition (Mean = -.13). There were no A-B differences on the dependent variable.

Thus, the scores on the MAACL and the State Anger Scale demonstrate that subjects in the Frustration-Provocation Condition reported greater increases in anxiety, hostility, and anger following the experimental manipulations than did subjects in the Frustration and Control Conditions. They also reported a greater increase in depression than did subjects in the Control Condition. There were no differences between Type A and Type B subjects on these measures. These findings, then, are the same as those based on the JAS classification of Type A behavior.

Type A Behavior and Hostile Aggression. To test the main hypotheses, a 2 (Behavior Type) x 3 (Condition) ANOVA was applied to the measure of hostile aggression. The pattern of results was the same as it was with the JAS

classification of Type A behavior. That is, there was a main effect for Condition ($F(2,80) = 71.00, p = .0001$) with subjects in the Frustration-Provocation Condition showing greater hostile aggression (Mean = 2.00) than subjects in the other conditions (Mean for the Frustration Condition = 1.00; Mean for the Control Condition = 1.00). There were no A-B differences on the measure of hostile aggression.

Perception of the Scripts. The subjects' perceptions of the aggressiveness of the content of the feedback scripts were examined by a 2 (Behavior Type) x 3 (Condition) repeated measures ANOVA. The analysis found that there was an increase in the ratings of aggressiveness across the three scripts ($F(2,160) = 226.60, p = .0001$). The third script was rated as more aggressive (Mean = 6.65) than the second script (Mean = 4.98). As well, the first script was rated as least aggressive in content (Mean = 2.69). There were no effects of Condition or Behavior Type on the aggressiveness ratings.

Rating of the Confederate. The ratings of the confederate were analyzed using 2 (Behavior Type) x 3 (Condition) ANOVAs. To begin, the ANOVA with the overall rating of the confederate as the dependent variable showed a main effect for Condition ($F(2,80) = 84.91, p = .0001$). Subjects in the Control Condition (Mean = 60.07) and the Frustration Condition (Mean = 57.90) rated the confederate

more positively than did subjects in the Frustration-Provocation Condition (Mean = 35.42). As in the JAS analyses, the ANOVAs based on the individual items of the rating scale showed a main effect for Condition on each of the dimensions. The F statistics for these analyses are presented in Table 5.

Insert Table 5 about here

Subjects in the Frustration-Provocation Condition rated the confederate as less friendly, interesting, likeable, cooperative, and considerate, and as more boring, impatient, unsociable, incompetent, and hostile, than did subjects in the Control and Frustration Conditions. The mean ratings for each condition are given in Table 6.

Insert Table 6 about here

There were several analyses using the SI classification of Type A behavior that produced different results than the JAS analyses. The first was the 2 (Behavior Type) x 3 (Condition) ANOVA on the rating of the confederate's impatience. In addition to the main effect for Condition, there was also a main effect for Behavior Type ($F(1,80) = 6.57, p = .012$) on the rating of impatience. This was qualified, however, by a significant interaction between Condition and Behavior Type ($F(2,80) = 3.58, p = .033$).

Table 5

Summary of Condition x SI Analyses of Variance
on Ratings of the Confederate

<u>DIMENSIONS</u>	<u>EFFECTS</u>	<u>df</u>	<u>F</u>
FRIENDLY	Condition	2,80	83.52***
	SI	1,80	.00
	Condition x SI	2,80	3.28*
INTERESTING	Condition	2,80	7.33**
	SI	1,80	.10
	Condition x SI	2,80	.45
BORING	Condition	2,80	10.03***
	SI	1,80	3.65
	Condition x SI	2,80	2.86
LIKEABLE	Condition	2,80	72.54***
	SI	1,80	.33
	Condition x SI	2,80	2.62
IMPATIENT	Condition	2,80	41.74***
	SI	1,80	6.57*
	Condition x SI	2,80	3.58*
UNSOCIABLE	Condition	2,80	22.30***
	SI	1,80	1.63
	Condition x SI	2,80	1.60
INCOMPETENT	Condition	2,80	17.10***
	SI	1,80	.84
	Condition x SI	2,80	.48
COOPERATIVE	Condition	2,80	29.75***
	SI	1,80	.05
	Condition x SI	2,80	2.75

Table 5 (continued)

<u>DIMENSIONS</u>	<u>EFFECTS</u>	<u>df</u>	<u>F</u>
CONSIDERATE	Condition	2,80	57.82***
	SI	1,80	.04
	Condition x SI	2,80	1.79
HOSTILE	Condition	2,80	34.02***
	SI	1,80	.34
	Condition x SI	2,80	.54

* $p < .05$

** $p < .005$

*** $p < .001$

Table 6

Mean Ratings (with Standard Deviations) of the Confederate
by Condition

<u>ITEM</u>	<u>CONDITION</u>		
	<u>CONTROL</u>	<u>FRUSTRATION</u>	<u>FRUSTRATION- PROVOCATION</u>
FRIENDLY	5.63 (0.96)	5.47 (0.82)	2.23 (1.42)
INTERESTING	5.50 (0.73)	5.27 (0.69)	4.58 (1.20)
BORING	2.17 (1.18)	2.37 (1.38)	3.69 (1.69)
LIKEABLE	5.47 (0.97)	5.47 (1.04)	2.23 (1.39)
IMPATIENT	1.60 (0.86)	2.10 (1.06)	4.65 (2.12)
UNSOCIABLE	1.77 (1.17)	1.87 (1.25)	4.27 (2.16)
INCOMPETENT	1.37 (0.85)	1.87 (0.97)	3.12 (1.45)
COOPERATIVE	5.83 (1.53)	5.77 (0.90)	3.15 (1.76)
CONSIDERATE	5.67 (0.92)	5.50 (0.94)	2.58 (1.58)
HOSTILE	1.13 (0.43)	1.37 (0.61)	3.62 (2.06)

In the Frustration-Provocation Condition Type B subjects rated the confederate as more impatient (Mean = 5.67) than did Type A subjects (Mean = 3.79). Type A and Type B subjects had similar ratings of the confederate in the other two conditions.

The analysis on the rating of the friendliness of the confederate resulted in a Condition by Behavior Type interaction ($F(2,80) = 3.28, p = .043$). Although the post hoc tests did not find statistically significant differences between groups, the means suggest that, in the Frustration-Provocation Condition, Type B subjects tended to rate the confederate as more friendly (Mean = 2.67) than did Type A subjects (Mean = 1.86). Type A and Type B subjects made similar ratings of the confederate in the other conditions.

No main effects for Behavior Type or interaction effects were found in the ANOVAs with Interesting, Boring, Likeable, Unsociable, Incompetent, Cooperative, Considerate, and Hostile as dependent variables.

Rating of the Subject. The ratings of the subjects by the confederate were analyzed using 2 (Behavior Type) x 3 (Condition) ANOVAs. The ANOVA with the overall rating of the subjects as the dependent variable revealed a main effect for Condition ($F(2,80) = 5.23, p = .007$), with subjects in the Control Condition rated more positively (Mean = 54.23) than subjects in the Frustration-Provocation

Condition (Mean = 49.08). The mean rating of subjects in the Frustration Condition (Mean = 51.80) did not differ from the ratings of the other two groups. There was also a main effect for Condition on the items rating the extent to which the subject was Friendly, Cooperative, Considerate and Hostile. Unlike the JAS analysis, there was no effect of Condition on the dimension labelled boring. A summary of the ANOVAs is presented in Table 7.

Insert Table 7 about here

Subjects in the Frustration-Provocation Condition were rated as less friendly, less cooperative, and more hostile than subjects in the Frustration Condition and the Control Condition. As well, subjects in the Frustration-Provocation Condition were rated as less considerate than subjects in the Control Condition. The mean ratings for these dimensions can be found in Table 8.

Insert Table 8 about here

As shown in Table 7, the ANOVAs also revealed an effect for Behavior Type on the Friendly, Impatient, and Incompetent items. Type A subjects were rated as more friendly, impatient, and competent than Type B subjects. The mean values for these ratings are presented in Table 9.

Table 7

Summary of Condition x SI Analyses of Variance
on Ratings of the Subject

<u>DIMENSIONS</u>	<u>EFFECTS</u>	<u>df</u>	<u>F</u>
FRIENDLY	Condition	2,80	5.37**
	SI	1,80	6.71*
	Condition x SI	2,80	.03
INTERESTING	Condition	2,80	1.15
	SI	1,80	.56
	Condition x SI	2,80	1.10
BORING	Condition	2,80	2.09
	SI	1,80	.29
	Condition x SI	2,80	.56
LIKEABLE	Condition	2,80	2.27
	SI	1,80	1.65
	Condition x SI	2,80	.72
IMPATIENT	Condition	2,80	1.79
	SI	1,80	8.10**
	Condition x SI	2,80	1.62
UNSOCIABLE	Condition	2,80	.66
	SI	1,80	2.80
	Condition x SI	2,80	.10
INCOMPETENT	Condition	2,80	2.11
	SI	1,80	5.09*
	Condition x SI	2,80	.47
COOPERATIVE	Condition	2,80	11.67***
	SI	1,80	.51
	Condition x SI	2,80	.18

Table 7 (continued)

<u>DIMENSIONS</u>	<u>EFFECTS</u>	<u>df</u>	<u>F</u>
CONSIDERATE	Condition	2,80	5.97**
	SI	1,80	.59
	Condition x SI	2,80	1.12
HOSTILE	Condition	2,80	8.40***
	SI	1,80	.16
	Condition x SI	2,80	1.19

* $p < .05$

** $p < .01$

*** $p < .001$

Table 8

Mean Ratings (with Standard Deviations) of the Subjects
by the Confederate as a function of Condition

<u>ITEM</u>	<u>CONDITION</u>		
	<u>CONTROL</u>	<u>FRUSTRATION</u>	<u>FRUSTRATION- PROVOCATION</u>
FRIENDLY	4.80 (1.27)	4.50 (1.36)	3.69 (1.09)
COOPERATIVE	5.10 (1.42)	4.83 (1.56)	3.35 (1.23)
CONSIDERATE	4.73 (1.17)	4.23 (0.86)	3.77 (1.21)
HOSTILE	1.07 (0.25)	1.37 (0.76)	2.00 (1.36)

Insert Table 9 about here

There were no main effects for Behavior Type on the other dimensions. As well, there were no significant Condition by Behavior Type interactions on any of the ratings.

Thus, there were minor differences between these analyses and the JAS analyses. In the JAS analyses, there was an A-B difference on the rating of interesting, although no A-B differences were found on the ratings of friendliness and incompetence.

The confederate's ratings of the subjects on anger and aggression dimensions were also analyzed using 2 (Behavior Type) x 3 (Condition) ANOVAs. A significant effect for Condition was found on both anger ($F(2,80) = 30.44, p = .0001$) and aggression ($F(2,80) = 5.45, p = .006$). Subjects in the Frustration-Provocation Condition were rated as more angry (Mean = 2.65) than were subjects in the Frustration Condition (Mean = 1.40) and the Control Condition (Mean = 1.03). Subjects in the Frustration-Provocation Condition were also rated as more aggressive (Mean = 2.00) than subjects in the Control Condition (Mean = 1.20). There were no effects for Behavior Type on the ratings of anger and aggression. This is identical to the pattern of results found using the JAS classification of Type A behavior.

Table 9

Mean Ratings (with Standard Deviations) of the Subjects
by SI Classification

<u>ITEM</u>	<u>SI CLASSIFICATION</u>	
	<u>TYPE A</u>	<u>TYPE B</u>
FRIENDLY	4.67 (1.24)	3.91 (1.31)
IMPATIENT	2.53 (1.29)	1.74 (1.20)
INCOMPETENT	1.47 (0.61)	1.86 (1.06)

Type A Behavior and Attributions. The subjects' attributions for their performance were analyzed with 2 (Behavior Type) x 3 (Condition) ANOVAs. The analyses using the SI classification of Type A behavior resulted in the same pattern of findings as the analyses using the JAS classification of Type A behavior. There was a main effect for Condition on ratings of Expectation ($F(2,80) = 4.94, p = .010$), Partner's Ability ($F(2,80) = 3.50, p = .035$), Partner's Attitude ($F(2,79) = 8.38, p = .0005$), and Luck ($F(2,80) = 4.79, p = .011$). Subjects in the Control Condition rated their performance relative to their expectations as higher than did subjects in the Frustration Condition. As well, subjects in the Frustration-Provocation Condition attributed their performance to their partner's ability and their partner's attitude to a greater extent than did subjects in the Frustration Condition. Subjects in the Frustration Condition, on the other hand, made greater attributions to luck than did subjects in the Frustration-Provocation Condition. The means for these ratings are stated in Table 10.

Insert Table 10 about here

As in the analyses using the JAS, there was a main effect for Behavior Type on the attribution to the Difficulty of the Task ($F(1,80) = 5.50, p = .022$). Type B subjects made

Table 10

Mean Ratings (with Standard Deviations) for Attributions
by Condition

<u>ATTRIBUTION</u>	<u>CONDITION</u>		
	<u>CONTROL</u>	<u>FRUSTRATION</u>	<u>FRUSTRATION- PROVOCATION</u>
EXPECTATION	4.50 (1.14)	3.47 (1.41)	3.58 (1.72)
PARTNER'S ABILITY	4.70 (0.75)	4.33 (0.80)	4.96 (1.00)
PARTNER'S ATTITUDE	4.50 (1.01)	3.90 (1.01)	5.12 (1.56)
LUCK	2.30 (1.21)	2.67 (1.21)	1.69 (0.84)

greater attributions to the difficulty of the task (Mean = 4.74) than did Type A subjects (Mean = 4.02).

Type A Behavior, Anger Expression, and Hostile Aggression. The relationship between Type A behavior, anger expression and hostile aggression was explored using a 2 (Behavior Type) x 3 (Condition) ANOVA with a median split performed on the Anger Expression scores to divide the sample into high anger expression subjects and low anger expression subjects. This analysis produced results similar to the analysis using the JAS definition of Type A behavior. There was a main effect for Condition ($F(2,74) = 83.51, p = .0001$), with subjects in the Frustration-Provocation Condition exhibiting greater hostile aggression (Mean = 2.00) than subjects in the Frustration Condition (Mean = 1.00) and the Control Condition (Mean = 1.00). The ANOVA also revealed a main effect for Anger Expression ($F(1,74) = 8.04, p = .006$), with low anger expression subjects showing greater hostile aggression (Mean = 1.40) than high anger expression subjects (Mean = 1.20). These main effects were qualified by a Condition by Anger Expression interaction ($F(2,74) = 8.12, p = .0006$). Low anger expression subjects in the Frustration-Provocation Condition showed greater hostile aggression (Mean = 2.29) than did high anger expression subjects in this condition (Mean = 1.67). There were no differences between these groups in the Frustration and Control Conditions. No significant effects for Behavior Type were found.

A similar analysis was performed using a median split on the measure of anger-in. This 2 (Behavior Type) x 3 (Condition) x 2 (Anger-In) ANOVA resulted in main effects for both Condition ($F(2,74) = 95.06, p = .0001$) and Anger-In ($F(1,74) = 16.70, p = .0001$). More specifically, subjects in the Frustration-Provocation Condition demonstrated greater hostile aggression (Mean = 2.00) than did subjects in the Frustration and the Control Conditions (Mean = 1.00 for both conditions). As well, high anger-in subjects showed greater hostile aggression (Mean = 1.45) than did low anger-in subjects (Mean = 1.16). Consistent with the analysis using the JAS classification of Type A behavior, there was also a significant Condition by Anger-In interaction ($F(2,74) = 16.83, p = .0001$). As in the JAS analysis, high anger-in subjects in the Frustration-Provocation Condition showed greater hostile aggression (Mean = 2.36) than did low anger-in subjects in this condition (Mean = 1.58). There were no differences between high and low anger-in subjects in the other two conditions. Unlike the JAS analysis, however, the test for the Condition by Behavior Type by Anger-In interaction was not significant in this analysis ($F(2,74) = .39, p = .676$).

A 2 (Behavior Type) x 3 (Condition) x 2 (Anger-Out) ANOVA was also performed with hostile aggression as the dependent variable. As with the Anger Expression and Anger-In scores, a median split was done to divide the sample into

high and low anger-out subjects. As in the JAS analysis, there was a main effect for Condition ($F(2,74) = 53.47, p = .0001$). Subjects in the Frustration-Provocation Condition showed greater hostile aggression (Mean = 2.00) than did subjects in the other conditions (Mean = 1.00 for the Frustration and Control Conditions). Unlike the analysis using the JAS, there was also an effect for Anger-Out ($F(1,74) = 4.82, p = .031$). Greater hostile aggression was expressed by low anger-out subjects (Mean = 1.40) than by high anger-out subjects (Mean = 1.15). In addition, in this analysis the Condition by Anger-Out interaction was significant ($F(2,74) = 4.83, p = .011$). While high and low anger-out subjects demonstrated similar levels of hostile aggression in the Frustration and Control Conditions (Mean for each group = 1.00), in the Frustration-Provocation Condition low anger-out subjects showed greater hostile aggression (Mean = 2.17) than did high anger-out subjects (Mean = 1.63). No effects for Behavior Type were found.

Correlational Analysis

Attributions and Hostile Aggression. To test the hypotheses about the relationship between attributions and aggression, Pearson product moment correlations were computed between the measures of attributions and the measure of hostile aggression. The initial analysis (based on the complete sample) revealed a significant correlation

between hostile aggression and attributions to the subject's ability ($r = -.313$, $p = .003$), subject's attitude ($r = .221$, $p = .037$), partner's attitude ($r = .451$, $p = .0001$) and luck ($r = -.221$, $p = .036$). Correlations were also calculated between the attributional measures and hostile aggression for subjects in the Frustration-Provocation Condition. This was of particular interest because the Frustration-Provocation Condition was the only condition in which there was variability on the measure of hostile aggression. This correlational analysis demonstrated that hostile aggression was correlated with attributions to the subject's ability ($r = -.419$, $p = .021$) and the partner's attitude ($r = .460$, $p = .011$).

Attributions and Rating of the Confederate.

Correlations between the attributional measures and the rating of the confederate were also computed. This analysis showed a correlation between how positively the confederate was rated and attributions to the subject's ability ($r = .225$, $p = .033$), partner's attitude ($r = -.261$, $p = .013$), and luck ($r = .215$, $p = .042$).

Anger Expression and Hostile Aggression. The hypothesis about the relationship between anger expression and hostile aggression was tested by computing the Pearson product moment correlation between anger expression and hostile aggression. This was done for the complete sample and for the Frustration-Provocation Condition. The results

showed that while there was no correlation between these variables in the complete sample, the correlation approached significance in the Frustration-Provocation Condition ($r = -.358$, $p = .052$).

Anger-In and Hostile Aggression. The relationship between hostile aggression and the measure of anger-in (based on the Anger-In subscale of the Anger Expression scale) was also explored using a correlational analysis. While there was not a correlation between these variables in the entire sample, there was a correlation between hostile aggression and anger-in the Frustration-Provocation Condition ($r = .474$, $p = .008$).

Anger-Out and Hostile Aggression. The relationship between anger-out and hostile aggression was examined by computing Pearson product moment correlations between these variables. These correlations were not significant when calculated for both the entire sample and the Frustration-Provocation Condition.

Assertion and Hostile Aggression. Pearson product moment correlations were calculated to test the hypotheses about the relationship between assertion and aggression. The correlations between Response Probability (ie. the likelihood of behaving in an assertive manner) and hostile aggression and the correlation between Response Discomfort (ie. the discomfort associated with behaving in an assertive

manner) and hostile aggression were not significant when calculated for the complete sample. These correlations were also computed for the Frustration-Provocation Condition and were found to be nonsignificant.

Assertion and Anger Expression. Correlations between the measures of assertion and anger expression (including Anger Expression, Anger-In, and Anger-Out) were also calculated. Significant negative correlations between Anger Expression and Response Probability ($r = -.279$, $p = .008$), and Anger Expression and Response Discomfort ($r = -.392$, $p = .0001$) were found. This indicated that as Anger Expressiveness increases, the probability of behaving assertively also increases (low scores on the Response Probability scale indicate that an individual behaves assertively while high scores indicate that a person does not behave assertively). As well, as anger expressiveness increases, discomfort about being assertive decreases. There were also positive correlations between Anger-In and Response Probability ($r = .308$, $p = .003$) and between Anger-In and Response Discomfort ($r = .424$, $p = .0001$). These correlations demonstrate that anger-in is associated with an increased reluctance to act assertively and with greater discomfort in situations requiring assertive behavior. The correlations between Anger-Out and Response Probability and between Anger-Out and Response Discomfort were not significant.

It should be noted that as expected there was a positive correlation between Response Discomfort and Response Probability ($r = .654$, $p = .0001$). That is, increasing discomfort in situations requiring assertive behavior is associated with increasing reluctance to behave assertively in those situations.

Regression Analyses

In examining the impact of the various independent measures on hostile aggression, a stepwise multiple regression approach was used. This approach is designed to approach the maximum R - squared with the minimum number of independent variables (Cohen & Cohen, 1983). The stepwise multiple regression was performed with Type A behavior, attributions, assertion, and anger expression as predictors of hostile aggression. The JAS scores and the SI classification were both entered as measures of Type A behavior. The attributional measures included ratings of expectations, as well as, measures of attributions to their ability, their partner's ability, their effort, their partner's effort, their attitude, their partner's attitude, difficulty, and luck. The response probability score of the AI was used as the measure of assertion. Finally, the anger expression scores as well as the anger-in and anger-out scores were entered as the measures of anger.

As shown in Table 11, the regression on the entire sample resulted in an overall multiple r of .53. A test of the significance of the sample squared multiple correlation (Wilkinson, 1979) found the adjusted R - squared value (adjusted R - squared = .2634) to be significant at the .05 level. As Wilkinson (1979) and Cohen and Cohen (1983) suggest this is a more appropriate method in evaluating the results from a stepwise regression than the usual F statistics. It should be noted that the adjusted R - squared is reported because of the small n to k ratio in the regression analysis (approximately six subjects per variable). Two variables entered the equation and together accounted for 26% of the variance. Attributions to the partner's attitude entered the equation first, accounting for 17% of the variance. Attribution to the subject's ability accounted for an additional 9% of the variance. The other variables did not enter the equation.

Insert Table 11 about here

A similar stepwise regression analysis was performed on subjects in the Frustration-Provocation Condition. Three variables entered the equation (anger-in, difficulty, and expectations) resulting in an overall multiple r of .69, with an adjusted R - squared of .40. Although the F test suggested that the model was significant ($F(3,22) = 6.63$,

Table 11

Summary of Stepwise Multiple Regression on Hostile
Aggression

Full Equation Multiple r	.5300
R - squared	.2809
adjusted R - squared	.2634

<u>Variable</u>	<u>Beta</u>	<u>Multiple R-squared</u>	<u>Change in R-squared</u>
Partner's Attitude	.386	.1694	.1694
Subject's Ability	-.321	.2634	.0940

$p < .05$), the table of values for the distribution of R - squared (Wilkinson, 1979) indicated that the obtained R - squared value was not significant at the .05 level.

DISCUSSION

There are three major findings in the present study which have important implications and warrant discussion. First of all, contrary to prediction, Type A subjects relative to Type B subjects did not endorse feedback letters containing more aggressive content following frustration or frustration combined with interpersonal provocation. Secondly, support was found for the hypothesis that anger expression would be associated with hostile aggression. The nature of this association, however, was inconsistent with prediction. Subjects classified as low on anger expression, high on anger-in, and low on anger-out showed greater hostile aggression following provocation than did high anger expression, low anger-in, and high anger-out subjects. Finally, as predicted, attributions for failure were associated with hostile aggression. In particular, the greater the attributions to the attitude of the confederate, the greater the hostile aggression following provocation. As well, attributions for failure to the subject's ability resulted in reduced hostile aggression. A discussion of these findings and a consideration of the implications for theory on the Type A behavior pattern follow. In addition, a brief comment will be made about the failure to observe a relationship between assertiveness and aggression.

Type A Behavior and Hostile Aggression

The major hypotheses of the present study involved the effects of frustration and provocation on interpersonal hostile aggression. As the measures of self-reported mood demonstrate, the provocation manipulation was clearly successful in increasing subjects' anxiety, depression, hostility, and anger. Although the changes in mood reported by subjects in the Frustration Condition were not significantly different from the self-reports of subjects in the Control Condition, the means were in the expected direction. Furthermore, compared to subjects in the Control Condition, subjects in the Frustration Condition indicated that their performance was lower than their expectations. Overall, this suggests that the manipulations did provide a test of the hypotheses.

The results indicated that all subjects showed increased aggression in the Frustration-Provocation Condition relative to the Frustration and Control Conditions. Type A subjects, however, did not demonstrate greater hostile aggression than did Type B subjects in any condition. On the one hand, the failure to find differences in aggression between Type A and Type B subjects following provocation is inconsistent with previous research which has demonstrated this difference. For example, Check and Dyck (1986) found that Type A subjects exhibited a greater degree of hostile aggression following a negative evaluation from

the confederate than did Type B subjects. On the other hand, the present findings are consistent with four studies which did not find A-B differences in response to provocation (Baron et al., 1985; Carver & Glass, 1978; Edguer, 1987; Holmes & Will, 1985). Baron et al. (1985), for example, found that provocation increased aggression among subjects who obtained moderate scores on the JAS (the measure of Type A behavior used in the study). Similar effects were not found for Type A or Type B subjects. In fact, provocation tended to reduce aggression among Type A subjects, while it did not result in any change in aggression by Type B subjects. Edguer (1987) found no evidence of more aggression by SI-defined Type A subjects compared to Type B subjects following a provocation manipulation. Holmes and Will (1985) also found that Type A and Type B subjects did not deliver different levels of punishment following provocation. While they found A-B differences, these were limited to the no-anger condition. Finally, Carver and Glass (1978) also failed to find A-B differences in aggression in the provocation condition in their study.

In the present study there was also a failure to find increased aggression following a frustration manipulation. This is inconsistent with several published studies. For example, Carver and Glass (1978) found that while there were no A-B differences following provocation, Type A subjects

expressed more aggression than Type B subjects in the frustration condition. They concluded that provocation was not necessary to produce heightened aggression among Type A subjects. The frustration of being given a task they could not perform yielded nearly as much aggression among Type A subjects as did the frustration-provocation procedure. Strube et al. (1984) also found that frustrated Type A subjects administered greater fines than frustrated Type B subjects and nonfrustrated Type A and Type B subjects.

There are several possible explanations for the absence of A-B differences in behavioral aggression following frustration and frustration paired with provocation. First of all, there are a number of ways in which the methodology of this study differed from previous studies. For example, the experimental context in which aggression was measured was notably different from that of previous studies. In the majority of these studies (eg. Baron et al., 1985; Carver & Glass, 1978; Edguer, 1987; Check & Dyck, 1986; Holmes & Will, 1985; Strube et al., Study 1, 1984) a teacher-learner paradigm was used. In using this paradigm, the subject and confederate are often physically separated from each other either by being placed in adjacent rooms (eg. Baron et al., 1985; Check & Dyck, 1986; Strube et al., Study 1, 1984) or by having a partition placed between them (Holmes & Will, 1985). That this arrangement disinhibits aggression is supported by the observation that aggressive behavior is

lower under conditions in which the subject must directly address the confederate compared to conditions in which the aggression is anonymous and indirect (Burnstein & Worchel, 1962). In the present study, the subject and confederate were engaged in face-to-face interaction and the aggression measure involved direct feedback to the confederate. It is possible, then, that the direct contact between the subject and confederate inhibited aggression in the Frustration and Frustration-Provocation Conditions, thereby reducing the likelihood of observing potential A-B differences.

In previous studies, there has also been explicit sanctioning of the use of aggression. In these studies the experimenter stated that the subject was free to choose any level of aggression during the learning trials. In addition, the subject was placed in the role of "teacher" which, through its association with authority, further sanctioned the use of aggression. Although given the opportunity to select any of the feedback letters, in this study the experimenter did not explicitly give permission for the subject to be aggressive. Furthermore, the subject was not in any role which implied power or dominance and thus sanctioned the use of aggression. In the absence of explicit approval for aggressive behavior and an assigned role which might justify aggressive behavior, it is possible that Type A individuals experienced aggressive tendencies but attempted to control their responses in order to avoid

behaving in a way which might be interpreted as excessive or socially inappropriate. As Zillmann (1979) discusses, at intermediate levels of excitation an individual's retaliatory action is guided by his or her anticipation of approval or reproach. It is possible that Type A individuals were concerned about retaliation from the confederate or disapproval from the experimenter.

Another possible explanation for the absence of A-B differences in aggression following provocation is that Type A subjects may have envisioned themselves as being provoked by a person who had a reason to be upset and was acting accordingly, rather than by a person who was deliberately behaving in an annoying way. In light of the importance that Type A individuals place on achievement, the frustration of continually failing at a task may have seemed to them to be the reason for the aggressive behavior by the confederate. This interpretation of the confederate's behavior may have inhibited the expression of aggression. Support for this interpretation is given by research suggesting that when provocation is perceived as occurring under mitigating conditions, there is an inhibiting effect on aggression (see Zillmann, 1979).

It is also important to note that the measure of aggression in the present study was different than the measures used in previous research. In these previous studies, aggression was measured by the level of shock,

aversive noise, small monetary fine, or pulse of heat delivered to the confederate. Although the measure used in this study detected increases in aggression following provocation, there was no variability in the other two conditions. It seems, therefore, that this measure was insensitive to changes in aggressive behavior. This may account for the failure to detect A-B differences.

An issue raised by these results is the effect of the ecological validity of the experimental context on the observation of A-B differences in aggression. The present investigation was designed to model a situation which contained both aggressive prompts and restraints. Previous studies that have observed hostile aggression differences between Type A and Type B individuals (eg. Check & Dyck, 1986; Strube et al., 1984) have deliberately chosen to minimize the restraints. It is possible, therefore, that A-B differences in aggression may apply to a fairly restricted range of circumstances.

The results from this study might be further explained by the extent to which hostility and aggression are measured by instruments used to assess the TABP. In this study two measures of Type A behavior were used: the JAS and the SI. As described earlier, the JAS is a self-report measure consisting of 21 scored items. Only one of these items pertains to hostility, and this question only addresses hostility when younger. As Matthews (1982) discusses, the

JAS may be unable to predict hostility because items on anger are markedly underrepresented. The SI was also used as a measure of the TABP. Although it has been shown that subjects classified as Type A on the SI report behavior which is consistent with the aggressive component of the behavior pattern (eg. Chesney et al., 1981), the size of the association between the SI and these measures is not large (Matthews, 1982). Thus, while the SI might be a more sensitive index of hostility and aggression, it appears that it is still not a strong measure of this component. This is understandable in light of the way in which the ratings of Type A behavior are made. While the classification is based on both self-reports of Type A behavior and on speech characteristics during the interview, the latter is considered more important in reaching a final decision. It is important to note, however, that speech behaviors considered indicative of the TABP may not necessarily be indicative of the hostility component. It is possible, for example, for an individual to be classified as Type A because of speech stylistics that are related more to the impatience component of the pattern than to the hostility component. Since individuals may be classified as Type A for reasons other than the expression of hostility, it is not surprising that differences between Type A and Type B individuals on hostility and aggression are not always found.

On a related methodological note, it should be pointed out that there were few differences between JAS-defined and SI-defined Type A subjects in this study. More importantly, there were no differences between these subjects in the analyses examining the relationship between Type A behavior and aggression. This suggests that neither measure is clearly superior in assessing the anger and hostility component of the TABP. As discussed above, there seem to be limitations in the ability of both of these measures to assess the anger component. This is supported by the ratings of the subject by the confederate. While there was validation for the impatience component of Type A behavior (both JAS-defined and SI-defined subjects were rated as more impatient than Type B subjects), there were no differences in the ratings of aggressiveness or anger for Type A and Type B subjects.

In addition to these methodological issues, the absence of increased aggression in Type A individuals relative to Type B individuals has important implications for several theoretical models of Type A behavior. A major theoretical perspective on Type A and B behavior patterns is the uncontrollability view developed by Glass (1977). Glass posits that the TABP is a style of coping with uncontrollable environmental stimuli. In particular, it is hypothesized that aggression occurs when Type A individuals' sense of mastery is threatened (Carver & Glass, 1978). The

findings of this study are not consistent with hypotheses based on this theory. Type A individuals did not show increased aggression following frustration/uncontrollability. It is possible that the manipulation was of sufficient duration that Type A individuals became helpless, hyporesponsive, and less aggressive, thereby eliminating A-B differences in aggression. The failure to observe A-B differences in changes in depression, however, raises questions about this explanation. What the findings suggest is that it may be an oversimplification to state that Type A individuals are more aggressive than Type B individuals when faced with a loss of control. It appears that there are other factors which are important in A-B differences in aggression under these conditions. One such factor, which has been examined, is whether the aggression is instrumental or hostile in its intentions. Future research should explore the role of factors such as the measure of aggression, social desirability, and the opportunity for retaliation in observing A-B differences. As well, in light of Glass' assertion that Type A individuals are initially hyperresponsive to loss of control, but become hyporesponsive following extended exposure to uncontrollability, it is important to test the impact of the length of exposure to uncontrollability on aggressive behavior.

In addition, the present study does not support Check and Dyck's (1986) hypothesis that provocation may underlie A-B differences in hostile aggression. The findings suggest that Type B individuals can respond as aggressively as Type A individuals to certain types of provocation. Further research is needed to clarify the relationship between provocation and hostile aggression in Type A and Type B individuals. In particular, future studies need to explore the conditions under which provocation elicits A-B differences in aggression. This will necessitate examining the effects of factors such as the nature of the provocation and the measure of aggression.

Finally, the results suggest that the self-appraisal model of the TABP (Strube, in press) may be important in understanding A-B differences in hostile aggression. According to this model, Type A individuals respond to situations that create uncertainty about abilities with attempts to generate diagnostic information. Type A behaviors are considered to be strategic attempts to reduce the uncertainty about one's abilities. Within this model, anger and hostility are thought to occur when attempts to reduce uncertainty are hindered in some way. According to Strube's model, the absence of increased aggression of Type A individuals relative to Type B individuals may have resulted because Type A individuals were not faced with uncertainty. That is, after being presented with repeated

failure, Type A individuals may have perceived that there was considerable evidence that the required abilities were not present. Without the need to generate further diagnostic information, neither the failure or the provoking behavior of the confederate were responded to more aggressively by Type A individuals than by Type B individuals. The validity of this interpretation is difficult to assess in the absence of direct measures of the effect of the experimental manipulations on the subjects' certainty about their abilities. Clearly, further research is required to provide empirical validation for this explanation of anger and hostility in the TABP. The hypotheses generated by this model, then, should provide an important direction for future research.

Anger Expression, Type A Behavior, and Hostile Aggression

As predicted, this study found that anger expression was associated with hostile aggression. The nature of this relationship, however, was contrary to expectation. According to Spielberger et al. (1985), anger expression (as measured by the AX) is a single bipolar dimension with behaviors ranging from strong inhibition or suppression of angry feelings to the extreme expression of anger towards others or the environment. Consistent with the definition of anger expression, anger-in refers to how often angry feelings are not expressed and anger-out refers to the

extent to which an individual engages in aggressive behaviors when angry. Based on these definitions, individuals who score high on anger expression and anger-out, and low on anger-in should show the most aggression when angered. In this study, however, subjects in the Frustration-Provocation Condition who scored low on the Anger Expression Scale exhibited greater hostile aggression than did subjects who scored high on the Anger Expression Scale. As well, high anger-in subjects showed greater hostile aggression than did low anger-in subjects in this condition. The opposite trend was observed for the Anger-Out subscale. That is, low anger-out subjects in the Frustration-Provocation Condition expressed greater hostile aggression than did high anger-out subjects.

There are several possible explanations for these findings. First, it is important to note that to date the relationship between the Anger Expression Scale and behavioral aggression has not been tested. While there is evidence of the validity of the AX and its subscales based on their relationship to other anger and personality measures, and systolic and diastolic blood pressure (see Spielberger et al., 1985), no studies have explored the relationship between these measures and behavioral aggression. It is possible that the AX is not positively associated with behavioral aggression.

A second explanation for these findings comes from a recent study by Janisse, Edguer, and Dyck (1986). They found that low anger expression subjects perceived greater control in anger situations than did high anger expression subjects. It is possible that the greater expression of aggression by low anger expression subjects in this study was a result of a greater sense of control in the situation. That is, perhaps the aggressive feedback presented to the confederate by low anger expression subjects was an attempt to exercise control in the situation. In contrast, high anger expression subjects may have perceived little control in the situation and became passive as a result.

Overall, these findings suggest important questions for future research. First of all, there is a definite need for the relationship between the Anger Expression Scale and behavioral aggression to be examined. More generally, the findings suggest that the expression of anger is a particularly important component in understanding behavioral aggression. As such, further research addressing the measurement of anger expression and examining its relationship to behavioral aggression is clearly warranted.

For the purposes of this study, an interesting finding is the interaction between JAS-defined Type A behavior and Anger-In. As reported earlier, following frustration and provocation, low anger-in Type A subjects showed less hostile aggression than did other subjects. There are

several possible explanations for these results. On a methodological level, it is possible that there are difficulties with self-reports of anger expression, especially for Type A individuals. As Herman et al. (1981) note, Type A individuals tend to distort their self-perceptions in a socially desirable direction. They conclude that the Type A individual may be largely unaware of his or her hostility. Self-reports of anger expression by Type A individuals, therefore, may not be particularly valid and lead to unexpected patterns of results such as those observed in this study.

There is a second possible explanation for this JAS by Anger-In interaction. Janisse et al. (1986) found that perception of control is an important variable associated with anger expression. Unfortunately, they only report on the relationship between the entire AX Scale and perceptions of control. It is possible, however, that there is a positive relationship between Anger-In and perceptions of control, and that the latter modulate the expression of aggression. Consistent with Janisse et al.'s (1986) findings that low anger expression was associated with greater perceived control, it would be expected that high anger-in subjects would perceive greater control than low anger-in subjects in anger situations, and thus act more aggressively following provocation. Thus, it is possible that under certain conditions a subset of Type A individuals

(namely those low on anger-in) may be particularly susceptible to perceptions of control loss. Furthermore, they may be more susceptible to becoming hyporesponsive when confronted with extended exposure to uncontrollability and show less hostile aggression than other subjects under such conditions. This suggests a possible refinement for Glass' (1977) uncontollability hypothesis. In order to fully understand the aggressiveness of Type A individuals it may be necessary to differentiate Type A individuals on perceptions of control in anger situations and study their aggressiveness. Further research examining the relationship between anger expression, the TABP, perceptions of control, and hostile aggression is clearly needed.

Taken together, these findings raise several issues for research on behavioral aggression in Type A individuals. First of all, this study suggests that not only are situational variables important in A-B differences in aggression, but individual difference factors in self-reported anger expressiveness are also important. There is a need for future research to explore these individual differences and their interaction with Type A behavior. Secondly, the findings suggest that the self-reported suppression of anger may be of particular importance in understanding aggression in Type A individuals. Continued attention to investigating this correlate of the TABP seems justified. Finally, the findings underline the weakness of

the current measures of the TABP to assess the anger and hostility component. Addressing this measurement problem is a necessary step in better understanding behavioral aggression in Type A individuals.

Attributions and Hostile Aggression

The findings of this study showed that, as expected, attributions for performance were associated with hostile aggression. For all subjects, regardless of the condition, the expression of hostile aggression was associated with decreased attributions to luck and the subject's ability, and with increased attributions to the subject's attitude and the partner's attitude. In the Frustration-Provocation Condition in particular, hostile aggression was associated with increased attributions to the partner's attitude and decreased attributions to the subject's ability. These findings add support to the hypothesis that aggression increases in accordance with attributions of blame (Kulik & Brown, 1979). The findings also suggest that aggression decreases when attributions for failure are made to causes other than the object of the aggression (eg. to the individual's own abilities). Overall, the findings suggest that the attributions that individuals make about situations are related to their expression of aggression in those situations. Further examination of the relationship between attributional style and aggression, therefore, should be

useful in the development of a predictive model of aggression.

Regarding the relationship between attributions and Type A behavior, this study found only one attributional dimension on which there was an A-B difference. This was the attribution to the difficulty of the task. This finding is consistent with a study by Brunson and Matthews (1981) which found that Type B individuals attributed their performance outcomes to external qualities including task difficulty. The absence of differences between Type A and Type B subjects on the other dimensions, however, adds further questions to the mixed results currently found in attributional research with Type A and Type B individuals. Some studies suggest that Type A individuals blame themselves more for negative outcomes than do Type B individuals (Brunson & Matthews, 1981; Musante, MacDougall, & Dembroski, 1984; Rhodewalt, 1984). Other research, however, has found that Type A individuals exhibit a self-serving bias in their attributions for outcome (Strube, 1985; Strube & Boland, 1986). It is important to note that there are methodological problems in the measurement of attributions which may be helpful in explaining the confusion in the literature in general, and the inability of the measure used in this study to detect A-B differences. As Strube and Boland (1986) discuss, the results of studies which use a causal source methodology (in which subjects

rate the extent to which causal sources influenced their performance) are ambiguous because individuals vary in their interpretation of how stable, internal, global, and controllable these causes are. They argue for the use of a causal dimension approach in which subjects generate causes and rate them along dimensions measuring internality, stability, globality, and controllability. This argument suggests that further research is needed to clarify the questions about Type A behavior and attributional style. In particular, future research must examine the attributions of Type A and Type B subjects not only under failure, but also under conditions of interpersonal provocation. In light of the observed relationship between attributions and aggression, this research may be helpful in understanding the aggression of Type A individuals under such conditions.

Assertion and Aggression

Contrary to expectation, assertiveness was not found to be associated with hostile aggression. This finding is understandable in light of the criticisms of assertiveness inventories which have been made. As Rimm and Masters (1974) discuss, assertiveness inventories indicate that an individual will respond in a situation without evaluating whether that response will be aggressive rather than assertive. The observed relationship in this study between assertiveness and anger expression further suggests that

assertiveness inventories assess how responsive an individual will be to a challenging situation, rather than the extent to which their responses are assertive. While the current measures may be helpful from a clinical perspective, it appears that further refinement in the measurement instruments must be made if research on the relationship between assertiveness and aggression is to be fruitful.

Conclusion

In summary, a comparison of this study to previous research suggests that it is an oversimplification to assert that Type A individuals display uniformly more hostile aggression than do Type B individuals. More research is needed to clarify the situational variables that are necessary to elicit these differences and the individual difference variables that are important in identifying which Type A individuals are likely to be aggressive in certain situations. In addressing these issues, researchers must attempt to use measures which are both ecologically valid and sensitive to differences in aggression. It may also prove worthwhile to develop aggression measures which predict enhanced cardiovascular responses. Furthermore, additional research is needed in order to explore the relationship between the TABP and aggression in women. To date, the studies have been restricted to men thereby limiting the generalizability of the findings.

There is also a need to further test the theoretical models of Type A behavior and their explanations for the aggressive behavior of Type A individuals. In this study neither the uncontrollability or provocation hypotheses could completely account for the findings. There was no increase in the aggression of Type A subjects following the failure manipulation, and no A-B differences following provocation. Further research is needed to more fully understand the conditions under which these hypotheses hold true. As well, it was suggested that the self-appraisal model may be helpful in explaining aggressive behavior in Type A individuals and in generating research questions.

It was also shown that anger expression and attributions are important variables in relation to aggression. Assertion, on the contrary, was not shown to be associated with aggression. Future research must both address methodological problems in measuring anger expression and attributions, and further explore the relationship between these variables and aggression. Examining the interaction between these variables and the TABP appears to be an important direction for Type A research.

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Appendix A

Summary of Suspiciousness x Behavior Type
 (based on the Jenkins Activity Survey) Analyses of Variance
 on Changes in Self-Reported Mood
 for Subjects in the Frustration-Provocation Condition

<u>MOOD MEASURE</u>	<u>EFFECTS</u>	<u>df</u>	<u>F</u>
CHANGE IN ANXIETY	JAS	1,41	.18
	SUSPICIOUS	1,41	8.32*
	JAS x SUSPICIOUS	1,41	.02
CHANGE IN DEPRESSION	JAS	1,41	1.46
	SUSPICIOUS	1,41	3.63
	JAS x SUSPICIOUS	1,41	0.00
CHANGE IN HOSTILITY	JAS	1,41	.78
	SUSPICIOUS	1,41	12.39**
	JAS x SUSPICIOUS	1,41	.01
CHANGE IN ANGER	JAS	1,41	.02
	SUSPICIOUS	1,41	1.10
	JAS x SUSPICIOUS	1,41	1.19

* $p < .05$ ** $p < .005$

Mean Changes in Self-Reported Mood (with Standard Deviation)
 for Suspicious and Nonsuspicious Subjects
 in the Frustration-Provocation Condition

<u>MOOD MEASURE</u>	<u>SUSPICIOUS</u>	<u>NONSUSPICIOUS</u>
CHANGE IN ANXIETY	.13 (2.47)	2.93 (3.19)
CHANGE IN DEPRESSION	2.00 (2.36)	4.10 (3.79)
CHANGE IN HOSTILITY	1.20 (2.24)	5.23 (4.10)
CHANGE IN ANGER	2.67 (7.39)	4.83 (6.43)

Appendix B

Mean Changes in Self-Reported Mood
 (with Standard Deviations)
 for Suspicious and Nonsuspicious Subjects
 in the Frustration Condition

<u>MOOD MEASURE</u>	<u>SUSPICIOUS</u>	<u>NONSUSPICIOUS</u>
CHANGE IN ANXIETY	-0.50 (2.88)	0.83 (3.01)
CHANGE IN DEPRESSION	-1.13 (5.89)	1.50 (4.98)
CHANGE IN HOSTILITY	-0.13 (3.56)	2.17 (3.97)
CHANGE IN ANGER	0.00 (1.93)	1.48 (3.81)

Appendix C

The Jenkins Activity Survey Form T

Medical research is trying to determine how life style may influence the health of people. This survey is part of such a research effort.

Please answer the questions on the following pages by marking the answers that are true for you. Each person is different, so there are no "right" or "wrong" answers. Of course, all you tell is strictly confidential -- to be seen only by the research team. Do not ask anyone else about how to reply to the items. It is your personal opinion that we want. Please use the answer sheet provided to record your responses to the items in this booklet.

Your assistance will be greatly appreciated.

For each of the following items, please circle the number of the ONE best answer on your answer sheet.

1. Do you ever have trouble finding time to get your hair cut or styled?
 1. Never
 2. Occasionally
 3. Almost always

2. Does college "stir you into action"?
 1. Less often than most college students
 2. About Average
 3. More often than most college students

3. Is your everyday life filled mostly by
 1. Problems needing solution
 2. Challenges needing to be met
 3. A rather predictable routine of events
 4. Not enough things to keep me interested or busy

4. Some people live a calm predictable life. Others find themselves often facing unexpected changes, frequent interruptions, inconveniences or "things going wrong". How often are you faced with these minor (or major) annoyances or frustrations?
 1. Several times a day
 2. About once a day
 3. A few times a week
 4. Once a week
 5. Once a month or less
5. When you are under pressure or stress, do you usually:
 1. Do something about it immediately
 2. Plan carefully before taking any action
6. Ordinarily, how rapidly do you eat?
 1. I'm usually the first one finished.
 2. I eat a little faster than average.
 3. I eat at about the same speed as most people.
 4. I eat more slowly than most people.
7. Has your spouse or some friend ever told you that you eat too fast?
 1. Yes often
 2. Yes, once or twice
 3. No, no one has told me this
8. How often do you find yourself doing more than one thing at a time, such as working while eating, reading while dressing, figuring out problems while driving?
 1. I do two things at once whenever practical.
 2. I do this only when I'm short of time.
 3. I rarely or never do more than one thing at a time.
9. When you listen to someone talking, and this person takes too long to come to the point, do you feel like hurrying him along?
 1. Frequently
 2. Occasionally
 3. Almost never
10. How often do you actually "put words in his mouth" in order to speed things up?
 1. Frequently
 2. Occasionally
 3. Almost never

11. If you tell your spouse or a friend that you will meet them somewhere at a definite time, how often do you arrive late?
 1. Once in a while
 2. Rarely
 3. I am never late.

12. Do you find yourself hurrying to get places even when there is plenty of time?
 1. Often
 2. Occasionally
 3. Rarely or never

13. Suppose you are to meet someone at a public place (street corner, building lobby, restaurant) and the other person is already 10 minutes late. Will you
 1. Sit and wait?
 2. Walk about while waiting?
 3. Usually carry some reading matter or writing paper so you can get something done while waiting?

14. When you have to "wait in line", such as at a restaurant, a store, or the post office do you
 1. Accept it calmly?
 2. Feel impatient but do not show it?
 3. Feel so impatient that someone watching could tell you were restless
 4. Refuse to wait in line, and find ways to avoid such delays

15. When you play games with young children about 10 years old, how often do you purposely let them win?
 1. Most of the time
 2. Half of the time
 3. Only occasionally
 4. Never

16. Do most people consider you to be
 1. Definitely hard-driving and competitive?
 2. Probably hard-driving and competitive?
 3. Probably more relaxed and easy going?
 4. Definitely more relaxed and easy going?

17. Nowadays, do you consider yourself to be
 1. Definitely hard-driving and competitive?
 2. Probably hard-driving and competitive?
 3. Probably more relaxed and easy going?
 4. Definitely more relaxed and easy going?
18. How would your spouse (or closest friend) rate you?
 1. Definitely hard-driving and competitive?
 2. Probably hard-driving and competitive?
 3. Probably relaxed and easy going?
 4. Definitely relaxed and easy going?
19. How would your spouse (or best friend) rate your general level of activity?
 1. Too slow. Should be more active.
 2. About average. Is busy much of the time.
 3. Too active. Needs to slow down.
20. Would people who know you well agree that you take your work too seriously?
 1. Definitely Yes
 2. Probably Yes
 3. Probably No
 4. Definitely No
21. Would people who know you well agree that you have less energy than most people?
 1. Definitely Yes
 2. Probably Yes
 3. Probably No
 4. Definitely No
22. Would people who know you well agree that you tend to get irritated easily?
 1. Definitely Yes
 2. Probably Yes
 3. Probably No
 4. Definitely No
23. Would people who know you well agree that you tend to do most things in a hurry?
 1. Definitely Yes
 2. Probably Yes
 3. Probably No
 4. Definitely No

24. Would people who know you well agree that you enjoy "a contest" (competition) and try hard to win?
1. Definitely Yes
 2. Probably Yes
 3. Probably No
 4. Definitely No
25. Would people who know you well agree that you get a lot of fun out of your life?
1. Definitely Yes
 2. Probably Yes
 3. Probably No
 4. Definitely No
26. How was your "temper" when you were younger?
1. Fiery and hard to control.
 2. Strong, but controllable.
 3. No problem.
 4. I almost never got angry.
27. How is your "temper" nowadays?
1. Fiery and hard to control.
 2. Strong, but controllable.
 3. No problem.
 4. I almost never get angry.
28. When you are in the midst of studying and someone interrupts you, how do you usually feel inside?
1. I feel O.K. because I work better after an occasional break.
 2. I feel only mildly annoyed.
 3. I really feel irritated because such interruptions are unnecessary.

(Remember, the answers on these Questionnaires are confidential information and will not be revealed to officials at your school.)

29. How often are there deadlines in your courses? (If deadlines occur irregularly, please circle the closest answer below.)
1. Daily or more often
 2. Weekly
 3. Monthly
 4. Never

30. Do these deadlines usually
1. Carry minor pressure because of their routine nature?
 2. Carry considerable pressure, since delay would upset things a great deal?
31. Do you ever set deadlines or quotas for yourself in courses or other things?
1. No
 2. Yes, but only occasionally
 3. Yes, once per week or more often.
32. When you have to work against a deadline, is the quality of work
1. Better?
 2. Worse?
 3. The same? (Pressure makes no difference)
33. In school do you ever keep two projects moving forward at the same time by shifting back and forth rapidly from one to the other?
1. No, never.
 2. Yes, but only in emergencies.
 3. Yes, regularly.
34. Do you maintain a regular study schedule during vacations such as Thanksgiving, Christmas, and Easter?
1. Yes
 2. No
 3. Sometimes
35. How often do you bring your work home with you at night or study materials related to your courses?
1. Rarely or never.
 2. Once a week or less often.
 3. More than once a week.
36. How often do you go to the school when it is officially closed (such as nights or weekends)?
If this is not possible, circle 0.
1. Rarely or never.
 2. Occasionally (less than once a week).
 3. More than once a week.

37. When you find yourself getting tired while studying, do you usually
1. Slow down for a while until your strength comes back.
 2. Keep pushing yourself at the same pace in spite of the tiredness.
38. When you are in a group, do the other people tend to look to you to provide leadership?
1. Rarely
 2. About as often as they look to others.
 3. More often than they look to others.
39. Do you make yourself written lists of "things to do" to help you remember what needs to be done?
1. Never
 2. Occasionally
 3. Frequently

IN EACH OF THE FOLLOWING QUESTIONS, PLEASE COMPARE YOURSELF WITH THE AVERAGE STUDENT AT YOUR SCHOOL. PLEASE CIRCLE THE MOST ACCURATE DESCRIPTION.

40. In amount of effort put forth, I give
1. Much more effort
 2. A little more effort
 3. A little less effort
 4. Much less effort
41. In sense of responsibility, I am
1. Much more responsible
 2. A little more responsible
 3. A little less responsible
 4. Much less responsible
42. I find it necessary to hurry
1. Much more of the time
 2. A little more of the time
 3. A little less of the time
 4. Much less of the time
43. In being precise (careful about detail), I am
1. Much more precise
 2. A little more precise
 3. A little less precise
 4. Much less precise

44. I approach life in general

1. Much more seriously
2. A little more seriously
3. A little less seriously
4. Much less seriously

Appendix D

The Structured Interview (Student Form)

INTRODUCTION: Most of the questions are concerned with your superficial habits and none of them will embarrass you. I would appreciate it if you would answer the questions to the best of your ability. Your answers will be kept in the strictest confidence. (Begin taping: emphasize capitalized words).

Your code number is _____.

1. May I ask your age, PLEASE?
2. What is your student classification?
 - a. How long have you been at this university?
3. Are you SATISFIED with your school work thus far? (Why not?)
4. Do you feel that university carries HEAVY responsibility?
 - a. Is there any time when you feel particularly RUSHED or under PRESSURE?
 - b. When you are under PRESSURE does it bother you?
5. Would you describe yourself as a HARD-DRIVING, AMBITIOUS type of person in accomplishing the things you want, getting things done as QUICKLY as possible, OR would you describe yourself as a relatively RELAXED and EASY-GOING PERSON?
 - a. Do you have a boyfriend/girlfriend? (Close friend?)
 - b. How would he/she describe you. . . as HARD-DRIVING and AMBITIOUS or as relaxed and easy-going?
 - c. Has he/she ever asked you to slow down in your work? NEVER? How would he/she put it . . . in HIS/HER OWN words?
6. When you get ANGRY or UPSET, do people around you know it? How do you show it?
7. Do you think you drive HARDER to ACCOMPLISH things than most of your associates?
8. Do you complete homework assignments before they are due? How often?

9. Do you know any children between the ages of 6 and 8? Did you EVER play competitive games with them, like cards, checkers, Monopoly?
 - a. Did you ALWAYS allow them to WIN on PURPOSE?
 - b. WHY? (WHY NOT?)
10. When you play games with people your own age, do you play for the fun of it, or are you really in there to WIN?
11. Is there a lot of COMPETITION in school? Do you enjoy this?
 - a. Are you competitive in other areas...sports for example?
12. When you are in your automobile, and there is a car in your lane going FAR TOO SLOWLY for you, what do you do about it? Would you MUTTER and COMPLAIN to yourself? Would anyone riding with you know that you were ANNOYED?
13. Most people who go to school have to get up fairly early in the morning. . . in your particular case. . . what. . . time. . . do you. . . ordinarily. . . get up?
14. If you make a DATE with someone for, oh, two o'clock in the afternoon, for example, would you BE THERE on TIME?
 - a. If you are kept waiting, do you RESENT it?
 - b. Would you SAY anything about it?
15. If you see someone doing a job rather SLOWLY and you KNOW that you could do it faster and better yourself, does it make you RESTLESS to watch?
 - a. Would you be tempted to STEP IN AND DO IT yourself?
16. What IRRITATES you most about this university, or the students here?
17. Do you EAT RAPIDLY? Do you WALK rapidly? After you've FINISHED eating, do you like to sit around the table and chat, or do you like to GET UP AND GET GOING?
18. When you go out in the evening to a restaurant and you find eight or ten people WAITING AHEAD OF YOU for a table, will you wait? What will you do while you are waiting?
19. How do you feel about waiting in lines: BANK LINES, SUPERMARKET LINES, CAFETERIA LINES, POST OFFICE LINES. . .?

20. Do you ALWAYS feel anxious to GET GOING and FINISH whatever you have to do?
21. Do have the feeling that TIME is passing too RAPIDLY for you to ACCOMPLISH all the things you'd like to GET DONE in one day?
 - a. Do OFTEN feel a sense of TIME URGENCY? TIME PRESSURE?
22. Do you HURRY in doing most things?

All right, that completes the interview. Thank you very much.

Appendix E

The Multiple Affect Adjective Checklist

DIRECTIONS: On this sheet you will find words which describe different kinds of moods and feelings. Mark an x beside the words which describe how you feel now - today. Some of the words may sound alike, but we want you to check all the words that describe your feelings. Work rapidly.

- | | | |
|-------------------|--------------------|--------------------|
| 1 ___active | 19 ___calm | 37 ___discouraged |
| 2 ___adventurous | 20 ___cautious | 38 ___disgusted |
| 3 ___affectionate | 21 ___cheerful | 39 ___displeased |
| 4 ___afraid | 22 ___clean | 40 ___energetic |
| 5 ___agitated | 23 ___complaining | 41 ___enraged |
| 6 ___agreeable | 24 ___contented | 42 ___enthusiastic |
| 7 ___aggressive | 25 ___contrary | 43 ___fearful |
| 8 ___alive | 26 ___cool | 44 ___fine |
| 9 ___alone | 27 ___cooperative | 45 ___fit |
| 10 ___amiable | 28 ___critical | 46 ___forlorn |
| 11 ___amused | 29 ___cross | 47 ___frank |
| 12 ___angry | 30 ___cruel | 48 ___free |
| 13 ___annoyed | 31 ___daring | 49 ___friendly |
| 14 ___awful | 32 ___desperate | 50 ___frightened |
| 15 ___bashful | 33 ___destroyed | 51 ___furious |
| 16 ___bitter | 34 ___devoted | 52 ___gay |
| 17 ___blue | 35 ___disagreeable | 53 ___gentle |
| 18 ___bored | 36 ___discontented | 54 ___glad |

- | | | |
|--------------------|------------------|----------------------|
| 55 ___gloomy | 81 ___mild | 107 ___stormy |
| 56 ___good | 82 ___miserable | 108 ___strong |
| 57 ___good-natured | 83 ___nervous | 109 ___suffering |
| 58 ___grim | 84 ___obliging | 110 ___sullen |
| 59 ___happy | 85 ___offended | 111 ___sunk |
| 60 ___healthy | 86 ___outraged | 112 ___sympathetic |
| 61 ___hopeless | 87 ___panicky | 113 ___tame |
| 62 ___hostile | 88 ___patient | 114 ___tender |
| 63 ___impatient | 89 ___peaceful | 115 ___tense |
| 64 ___incensed | 90 ___pleased | 116 ___terrible |
| 65 ___indignant | 91 ___pleasant | 117 ___terrified |
| 66 ___inspired | 92 ___polite | 118 ___thoughtful |
| 67 ___interested | 93 ___powerful | 119 ___timid |
| 68 ___irritated | 94 ___quiet | 120 ___tormented |
| 69 ___jealous | 95 ___reckless | 121 ___understanding |
| 70 ___joyful | 96 ___rejected | 122 ___unhappy |
| 71 ___kindly | 97 ___rough | 123 ___unsociable |
| 72 ___lonely | 98 ___sad | 124 ___upset |
| 73 ___lost | 99 ___safe | 125 ___vexed |
| 74 ___loving | 100 ___satisfied | 126 ___warm |
| 75 ___low | 101 ___secure | 127 ___whole |
| 76 ___lucky | 102 ___shaky | 128 ___wild |
| 77 ___mad | 103 ___shy | 129 ___willful |
| 78 ___mean | 104 ___soothed | 130 ___wilted |
| 79 ___meek | 105 ___steady | 131 ___worrying |
| 80 ___merry | 106 ___stubborn | 132 ___young |

Appendix F

The State-Trait Anger Scale (State Form)

DIRECTIONS: A number of statements that people have used to describe themselves are given below. Read each statement and then circle the appropriate number to indicate how you feel right now. There are no right or wrong answers. Do not spend too much time on any one statement, but give the answer which seems to describe how you feel right now.

	NOT AT ALL	SOME- WHAT	MODER- ATELY SO	VERY MUCH SO
1. I am mad	1	2	3	4
2. I feel angry	1	2	3	4
3. I am burned up	1	2	3	4
4. I feel like I'm about to explode	1	2	3	4
5. I feel like banging on the table	1	2	3	4
6. I feel like yelling at somebody	1	2	3	4
7. I feel like swearing	1	2	3	4
8. I am furious	1	2	3	4
9. I feel like hitting someone	1	2	3	4
10. I feel like breaking things	1	2	3	4

Appendix G

The Attributional Questionnaire

DIRECTIONS: We are interested in your reaction to the problems you have just completed. Please circle the number which indicates your answer to the following questions. There are no right or wrong answers, but please consider each question carefully before you answer it.

1. To what extent did your and your partner's joint performance on the tasks meet with YOUR EXPECTATIONS?

1	2	3	4	5	6	7
Much below my Expectations			Met my Expectations			Much above my Expectations

2. How much did YOUR ABILITY determine your joint performance on the tasks?

1	2	3	4	5	6	7
Not at all			Somewhat			Entirely

3. How much did YOUR PARTNER'S ABILITY determine your joint performance on the tasks?

1	2	3	4	5	6	7
Not at all			Somewhat			Entirely

4. How much did YOUR EFFORT determine your joint performance on the tasks?

1	2	3	4	5	6	7
Not at all			Somewhat			Entirely

5. How much did YOUR PARTNER'S EFFORT determine your joint performance on the tasks?

1	2	3	4	5	6	7
Not at all			Somewhat			Entirely

6. How much did YOUR ATTITUDE toward the tasks determine your joint performance?

1	2	3	4	5	6	7
Not at all			Somewhat			Entirely

7. How much did YOUR PARTNER'S ATTITUDE toward the tasks determine your joint performance?

1	2	3	4	5	6	7
Not at all			Somewhat			Entirely

8. How much did the DIFFICULTY OF THE PROBLEMS determine your joint performance?

1	2	3	4	5	6	7
Not at all			Somewhat			Entirely

9. How much did LUCK determine your joint performance on the tasks?

1	2	3	4	5	6	7
Not at all			Somewhat			Entirely

Appendix H

Ratings of the Confederate/Subject

DIRECTIONS: Because this is an experiment on how people with different interpersonal styles interact to solve problems, we are interested in your perceptions of your partner's style. For the following adjectives, please indicate which point on the scale best captures your partner's style.

1. FRIENDLY

1	2	3	4	5	6	7
Not at all			Somewhat			Very
Friendly			Friendly			Friendly

2. INTELLIGENT

1	2	3	4	5	6	7
Not at all			Somewhat			Very
Intelligent			Intelligent			Intelligent

3. BORING

1	2	3	4	5	6	7
Not at all			Somewhat			Very
Boring			Boring			Boring

4. LIKEABLE

1	2	3	4	5	6	7
Not at all			Somewhat			Very
Likeable			Likeable			Likeable

5. IMPATIENT

1	2	3	4	5	6	7
Not at all		Somewhat			Very	
Impatient		Impatient			Impatient	

6. UNSOCIABLE

1	2	3	4	5	6	7
Not at all		Somewhat			Very	
Unsociable		Unsociable			Unsociable	

7. INCOMPETENT

1	2	3	4	5	6	7
Not at all		Somewhat			Very	
Incompetent		Incompetent			Incompetent	

8. COOPERATIVE

1	2	3	4	5	6	7
Not at all		Somewhat			Very	
Cooperative		Cooperative			Cooperative	

9. CONSIDERATE

1	2	3	4	5	6	7
Not at all		Somewhat			Very	
Considerate		Considerate			Considerate	

10. HOSTILE

1	2	3	4	5	6	7
Not at all			Somewhat			Very
Hostile			Hostile			Hostile

Appendix I
Feedback Scripts

Script #1

Based on our interaction in this experiment, you seem to be a cooperative person. You appear to be able to work well with other people and are probably well-liked by other students. You strike me as being a capable person who does well in his courses. I think that you are the kind of person I would enjoy working with on a project. I bet that you have many friends and I can certainly understand why.

Script #2

During this experiment you acted in ways which were inconsiderate. You seemed impatient with me and didn't strike me as being aware of how your behavior was making me feel. I'm not sure that I would want to work with you on a project, if I had the opportunity to do so. I wonder how many friends you have.

Script #3

You are a very rude, self-centered person. You were completely insensitive to how your behavior was making me feel. I would never want to work with you on any type of project. You would be impossible to get along with. I can't imagine why anyone would want to spend time with you. I bet that you have few friends, and I can certainly understand why.

Appendix J

Post-Experimental Questionnaire

DIRECTIONS: Please answer the following questions in the space provided.

1. Were you suspicious about any aspect of this experiment?

YES _____

NO _____

2. If your answer to Question 1 was yes, explain what you were suspicious about and why.

Appendix K

Assertion Inventory

Many people experience difficulty in handling interpersonal situations requiring them to assert themselves in some way, for example, turning down a request, asking a favor, giving someone a compliment, expressing disapproval or approval, etc. Please indicate your degree of discomfort or anxiety in the space provided before each situation listed below. Utilize the following scale to indicate degree of discomfort:

- 1 = none
- 2 = a little
- 3 = a fair amount
- 4 = much
- 5 = very much

Then, go over the list a second time and indicate after each item the probability or likelihood of your displaying the behavior if actually presented with the situation. For example, if you rarely apologize when you are at fault, you would mark a "4" after that item. Utilize the following scale to indicate response probability:

- 1 = always do it
- 2 = usually do it
- 3 = do it about half the time
- 4 = rarely do it
- 5 = never do it

NOTE: It is important to cover your discomfort ratings (located in front of the items) while indicating response probability. Otherwise, one rating may contaminate the other and a realistic assessment of your behavior is unlikely. To correct for this, place a piece of paper over your discomfort ratings while responding to the situation a second time for response probability.

DEGREE OF DISCOMFORT	SITUATION	RESPONSE PROBABILITY
_____	1. Turn down a request to borrow your car	_____
_____	2. Compliment a friend	_____
_____	3. Ask a favor of someone	_____
_____	4. Resist sales pressure	_____
_____	5. Apologize when you are at fault	_____
_____	6. Turn down a request for a meeting or date	_____
_____	7. Admit fear and request consideration	_____
_____	8. Tell a person you are intimately involved with when he/she says or does something that bothers you	_____
_____	9. Ask for a raise	_____
_____	10. Admit ignorance in some area	_____
_____	11. Turn down a request to borrow money	_____
_____	12. Ask personal questions	_____
_____	13. Turn off a talkative friend	_____
_____	14. Ask for constructive criticism	_____
_____	15. Initiate a conversation with a stranger	_____
_____	16. Compliment a person you are romantically involved with or interested in	_____
_____	17. Request a meeting or a date with a person	_____
_____	18. Your initial request for a meeting is turned down and you ask the person again at a later time	_____

DEGREE OF	SITUATION	RESPONSE
DISCOMFORT		PROBABILITY
_____19.	Admit confusion about a point under discussion and ask for clarification	_____
_____20.	Apply for a job	_____
_____21.	Ask whether you have offended someone	_____
_____22.	Tell someone that you like them	_____
_____23.	Request expected service when such is not forthcoming, eg. in a restaurant	_____
_____24.	Discuss openly with the person his/her criticism of your behavior	_____
_____25.	Return defective items, eg. store or restaurant	_____
_____26.	Express an opinion that differs from that of the person you are talking to	_____
_____27.	Resist sexual overtures when you are not interested	_____
_____28.	Tell the person when you feel he/she has done something that is unfair to you	_____
_____29.	Accept a date	_____
_____30.	Tell someone good news about yourself	_____
_____31.	Resist pressure to drink	_____
_____32.	Resist a significant person's unfair demand	_____
_____33.	Quit a job	_____
_____34.	Resist pressure to "turn on"	_____
_____35.	Discuss openly with the person his/her criticism of your work	_____

DEGREE OF DISCOMFORT	SITUATION	RESPONSE PROBABILITY
_____36.	Request the return of borrowed items	_____
_____37.	Receive compliments	_____
_____38.	Continue to converse with someone who disagrees with you	_____
_____39.	Tell a friend or someone with whom you work he/she says or does something that bothers you	_____
_____40.	Ask a person who is annoying you in a public situation to stop	_____

Lastly, please indicate the situations you would like to handle more assertively by placing a circle around the item number.

Appendix L

Anger Expression Scale

DIRECTIONS: A number of statements which people have used to describe themselves when they feel angry or furious are given below. Read each statement and then circle the number which indicates how often you feel or act in the manner described when angry or furious. There are no right or wrong answers. Do not spend too much time on any one statement. For each item circle the number which seems to best describe how you generally act or feel when you are angry or furious.

WHEN ANGRY OR FURIOUS....	ALMOST NEVER	SOME- TIMES	OFTEN	ALMOST ALWAYS
1. I control my temper . . .	1	2	3	4
2. I express my anger . . .	1	2	3	4
3. I keep things in	1	2	3	4
4. I make threats I don't really mean to carry out	1	2	3	4
5. I pout or sulk	1	2	3	4
6. I withdraw from people	1	2	3	4
7. I make sarcastic remarks to others	1	2	3	4
8. I keep my cool	1	2	3	4
9. I do things like slam doors	1	2	3	4
10. I boil inside, but I don't show it	1	2	3	4
11. I argue with others . . .	1	2	3	4
12. I tend to harbour grudges that I don't tell anyone about	1	2	3	4

- | | | | | | |
|-----|--|---|---|---|---|
| 13. | I strike out at whatever
infuriates me | 1 | 2 | 3 | 4 |
| 14. | I am secretly quite critical
of others | 1 | 2 | 3 | 4 |
| 15. | I am angrier than I am
willing to admit | 1 | 2 | 3 | 4 |
| 16. | I calm down faster than
most other people | 1 | 2 | 3 | 4 |
| 17. | I say nasty things | 1 | 2 | 3 | 4 |
| 18. | I am irritated a great
deal more than people
are aware of | 1 | 2 | 3 | 4 |
| 19. | I lose my temper | 1 | 2 | 3 | 4 |
| 20. | If someone annoys me,
I am apt to tell him
or her how I feel | 1 | 2 | 3 | 4 |

Appendix M

Debriefing Scripts

Control Condition

In this experiment we are interested in how people respond to the behavior of others under certain conditions. In particular, we are interested in how subjects respond to a cooperative person when they are working together on tasks.

In order to help us determine this, we had you work with a research assistant who was told to behave in a cooperative manner. We will be looking at how subjects like yourself respond to this assistant.

Please note that the tasks that you worked on are not measures of intelligence. Thus, you should not take your performance on the tasks as an indication of how intelligent you are.

We ask that you do not discuss the experiment with other Introductory Psychology students. They may be subjects in this experiment at a later date, and it is important that they are unaware of the purpose of the research when they participate.

If you have any questions about the research, please feel free to discuss them with the experimenter. Thank you for participating in this experiment.

Frustration Condition

In this experiment we are interested in how people respond to the behavior of others under certain conditions. In particular, we are interested in how subjects respond to a cooperative person when they are working together on tasks and fail to perform well on those tasks.

In order to help us determine this, we had you work with a research assistant who was told to cooperate with you on the tasks. The graphs you were shown were designed to lead you to believe that you and your partner did poorer than most other subjects on the tasks. That is, the graphs you were shown were not graphs of the scores of other subjects. In fact, the scores on the graphs are impossible to obtain in the time allotted for each task.

Please note that the tasks you worked on are not measures of intelligence as was stated. Thus, you should not take

your performance on the tasks as an indication of how intelligent you are.

We ask that you do not discuss the experiment with other Introductory Psychology students. They may be subjects in this experiment at a later date, and it is important that they are unaware of the purpose of the research when they participate.

If you have any questions about the research, please feel free to discuss them with the experimenter. Thank you for participating in this experiment.

Frustration-Provocation Condition

In this experiment we are interested in how people respond to the behavior of others under certain conditions. In particular, we are interested in how subjects respond to an aggressive, hostile person when they are working together on tasks and fail to perform well on those tasks.

In order to help us determine this, we had you work with a research assistant who was told to behave in a hostile way. He was told to make specific derogatory statements to you regardless of your behavior. He will say the same things to every subject in this condition of the experiment. The graphs you were shown were designed to lead you to believe that you and your partner did poorer than other subjects on the tasks. That is, the graphs you were shown were not graphs of the scores of other subjects. In fact, the scores on the graphs are impossible to obtain in the time allotted for each task. The purpose of these deceptions was to make you angry and have you respond accordingly to the assistant.

As well, please note that the tasks you worked on are not measures of intelligence as was stated. Thus, you should not take your performance on the tasks as an indication of how intelligent you are.

We ask that you do not discuss the experiment with other Introductory Psychology students. They may be subjects in this experiment at a later date, and it is important that they are unaware of the purpose of the research when they participate.

If you have any questions about the research, please feel free to discuss them with the experimenter. Thank you for participating in this experiment.