THE RELATIONSHIP OF SENSE OF HUMOR AND HOSTILITY TO THE TYPE A BEHAVIOR PATTERN

by

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CHAPTER I

INTRODUCTION

Pearl Pizzamiglio, a 60 year old woman who had no history of heart disease or hypertension, died of sudden cardiac death on November 19, 1983. Two hours before she died, she was robbed while working at the registration desk of a motel. The robber was later convicted of felony murder for, in essence, scaring her to death (Monagan, 1986). The legal system is beginning to acknowledge what has long been believed by others--that psychological as well as physical factors play a role in physical health and illness.

The concept of mind/body interaction can be traced back to the earliest recorded history of humankind (Murray, 1983). However, only recently has mind/body interaction been studied with scientific rigor as a result of technological advances and the advent of psychophysiology. One area which psychophysiological research has focussed on involves psychosocial factors associated with cardiovascular heart disease (CHD).

Significance of the Study

The need for treatment and prevention of CHD cannot be

overestimated. According to the World Almanac and Book of Facts (1988), more than 64 million Americans have one or more types of heart and blood vessel disease, and 47.6% of all deaths in the U.S. in 1985 were caused by some form of heart disease. Furthermore, CHD was expected to generate medical and lost output costs of 83.7 billion dollars in 1988 alone.

The variables that have become the risk factors traditionally associated with CHD are: an animal-fat diet, cigarette smoking, lack of exercise, obesity, high blood pressure, and serum cholesterol ("Can I avoid," 1974; Rosenman & Chesney, 1982). Curiously, these factors do not explain a significant portion of CHD incidence, different rates for different cultures, or individual differences, even when considered in combination (Gordon & Verter, 1969; Karvonen, Orma, Punsar, Kallio, Arstila, Luomanmaki, & Takkunen, 1970). Furthermore, eliminating these traditional risk factors has not been shown to eliminate CHD ("Can I avoid," 1974).

Research (Rosenman & Chesney, 1982) has suggested a relationship between Type A Behavior Pattern and CHD. Type A behavior includes "excessive competitive drive, aggressiveness, impatience, and a harrying sense of time urgency" (Friedman & Rosenman, 1974, p. 14). According to these authors, an individual who engages in this behavior pattern uses rapid/emphatic/clipped speech patterns, chronically struggles to do more and more in less and less

time, and exhibits a free-floating hostility. However, when the individual components of the pattern have been examined (Cohen, Syme, Jenkins, & Kagan, 1975; Dembroski, MacDougall, Williams, Haney, & Blumenthal, 1985; Katz & Toben, 1986), some authors have subsequently concluded that hostility is the key psychosocial factor associated with CHD. As a result, hostility (i.e., anger) has become a critical target of treatment and prevention (Levenkron, Cohen, Mueller, & Fisher, 1983). In the quest to modify hostility, subjects have been taught to avoid anger-inducing situations and/or to moderate responses due to hostility (Levenkron et al., 1983; Suinn, 1977). To date, however, no attempts have been made to identify responses which are incompatible with angry responses and could replace them.

One possible response incompatible with anger is humor. The idea that humor affects health is not a new one. Both positive and negative views of the psychological and physical impact of laughter and humor are known to have existed since the time of Plato (Goldstein, 1987; Middleton, 1986). Nevertheless, empirical support for the possible positive effects of laughter and humor on health is still lacking. Although there are over a thousand studies of humor and laughter in existence, studies addressing the long-term effects of humor and its absence or the physiological consequences of repeated or prolonged laughter are almost nonexistent (Goldstein, 1987).

However, existing evidence is promising. Studies of laughter of brief duration (Averill, 1969, Goldstein, Harman, McGhee, & Karasik, 1975) suggest that laughter is capable of reducing the autonomic arousal characteristic of stress. Fry (1979) has pointed out that this very attribute of laughter suggests its potential for reducing stress related to heart disease.

Mantell and Goldstein's (1985) proposition that humor replaces hostility in Type B individuals suggests the response which is incompatible with the hostility of Type A individuals and could replace it. However, the hostility of the Type A Behavior Pattern may actually manifest itself in humor--humor based upon hostility towards others--as is suggested in the nonverbal expression of emotion by those engaging in the Type A Behavior Pattern. Friedman, Harris, and Hall (1984) note that laughter associated with the Type A Behavior Pattern is forced, short, and explosive rather than a belly laugh.

Furthermore, previous studies of sense of humor have assessed appreciation rather than production of humor and have therefore been vulnerable to social desirability response bias. Thus, the humor which might replace the hostility of the Type A Behavior Pattern and which was investigated in this study consists of ". . . a generalized propensity toward humor regardless of the type of humor involved. . ." (Martin & Lefcourt, 1984, p. 145). Such humor was measured using an instrument not susceptible

to demand characteristics.

Statement of the Problem

The question addressed in this study is: What is the relationship of sense of humor and anger to the Type A Behavior Pattern? Mantell and Goldstein (1985) have suggested that individuals with the Type B Behavior Pattern may possess a sense of humor in place of the hostility of those with the Type A Behavior Pattern. Furthermore, Fry (1979) has pointed out that laughter may reduce the stress related to heart disease by reducing autonomic arousal.

Statement of the Hypothesis

The following null hypothesis was tested using an alpha of .05:

H o: In the population there is no significant relationship between behavior pattern and a linear additive combination of the variables of sense of humor and anger.

The alternative hypothesis was:

H 1: In the population there is a significant relationship between behavior pattern and a linear additive combination of the variables of sense of humor and anger.

Definition of Terms

Behavior pattern. The Type A Behavior Pattern

consists of a constellation of behaviors which include competitiveness, aggressiveness, time urgency, impatience, rapid/emphatic/clipped speech, a chronic struggle to do more and more in less and less time, and manifestation of free-floating hostility (Friedman & Rosenman, 1974). The Type B Behavior Pattern consists of the absence of components of the Type A Behavior Pattern (Friedman & Rosenman, 1974). Behavior pattern was operationally defined as the score achieved on the Jenkins Activity Survey (JAS) Type A scale.

Sense of humor. Sense of humor consists of the frequency with which the individual smiles, laughs, or otherwise displays amusement over a variety of situations (Martin & Lefcourt, 1984). This was operationally defined as the score achieved on the Situational Humor Response Questionnaire (SHRQ).

Anger. Anger is an emotional response to provocation (Novacco, 1975). This was operationally defined as the score achieved on the Novacco Anger Scale (NAS).

Limitations of the Study

Due to the nature of the research design used in this study (a correlational design), it was not possible to identify causal relationships. Other limitations included the use of volunteers and the restricted range of educational attainment and of current, previous, and projected occupations of the sample. Level of education

and occupational status have been correlated with Type A Behavior Pattern (Rosenman & Chesney, 1980; Waldron, Zyzanski, Shekelle, Jenkins, & Tannebaum, 1977).

Assumptions of the Study

It was assumed that the pool of individuals, all social science classes at a large southwestern junior college, from which the subjects for this study were drawn was no different from similar populations of students enrolled in social science classes at other junior colleges in the southwest region of the United States. It was also assumed that random selection of classes from this pool would provide a representative sample of the students in the pool.

An antithetical relationship between sense of humor and hostility was assumed. Finally, it was assumed that hostility and the Type A Behavior Pattern, as well as the cardiovascular heart disease often associated with them, reduce the quality of life and that it is appropriate to search for a replacement for the hostility characteristic of this behavior pattern.

CHAPTER II

REVIEW OF RELATED LITERATURE

The concept of mind/body interaction can be traced back to the earliest recorded history of humankind (Murray, 1983). In fact, the heart itself was viewed as the specific body site associated with the soul and mind by the ancient Egyptians, and this view persisted through the period of classical Greece. Aristotle conceptualized the heart and brain as being so dependent upon one another that they could not be separated. The transition from the heart to the brain as the organ believed to control the body began with the Alexandrian anatomists, Herophilus (about 300 B.C.) and Erasistratus (about 260 B.C.) and was reaffirmed by the famous Roman physician, Galen (about 130 to 200 A.D.). This view was essentially adopted and maintained by Christian writers, although the soul and body were viewed as less closely connected than Aristotle had believed because of the Christian view of the soul as immortal. In the seventeenth century, Descartes proposed dualism, a theory in which the mechanistic human body interacts with, but is separate from, the soul. Charcot and Freud's assertions during the nineteenth century that some physical problems such as conversion disorders were

the result of unconscious conflicts reintroduced the concept of mind/body interaction However, the subsequent emergence of behaviorism and its initial disinterest in cognitions re-established the chasm between body and mind Eventually, as behaviorism matured, cognitions were recognized as important additional behaviors which influence feelings and physiological functioning. Concurrently, technological advances made it possible to measure the impact of psychosocial factors upon the human body's physiological processes Psychophysiology was born, and acknowledgment of mind/body interaction was reborn

One particular area which psychophysiology has recently addressed is psychosocial factors associated with cardiovascular heart disease (CHD). The Framingham Study, an epidemiological study of CHD (Shurtleff, 1974), specified the following as definite manifestations of CHD: myocardial infarction, coronary insufficiency, angina pectoris, sudden death from CHD, and non-sudden death from CHD As with the more general concept of mind/body interaction, the idea of a relationship between psychosocial factors and CHD is not new. For example, Rosenman and Chesney (1982) note that

> Van Dusch observed in 1868 that persons with loud vocal stylistics and excessive work involvement were predisposed to CHD Osler (1892) strongly implicated stress and hard-driving behavior in CHD Many years later, Menninger and Menninger (1936) observed CHD patients to be characterized by strongly aggressive behavior Dunbar (1943) found them hard-driving and goal directed, and Kemple (1945) perceived them to be ambitious and compulsively striving to achieve goals

> that incorporated power and prestige. Arlow (1945) and Gildea (1949) observed similar behavior, and in 1950 Stewart correlated new conditions of stress in England with increased CHD rates. (p. 548)

However, the concept of a relationship between behavior and CHD has only been approached with scientific rigor during the past approximately 30 years. This recent research (Rosenman & Chesney, 1982) has suggested that there is a relationship between a psychosocial factor, Type A Behavior Pattern (also known as Coronary-Prone Behavior) and CHD which holds promise for treatment and prevention of CHD.

The Type A Behavior Pattern includes competitiveness, aggressiveness, impatience, and a sense of time urgency (Friedman & Rosenman, 1974). Individuals displaying this pattern use rapid/emphatic/clipped speech, struggle to do more and more in less and less time, and exhibit free-floating hostility. On the other hand, the converse behavior pattern, Type B, is characterized by an absence of time urgency, excessive competitive drive, and free-floating hostility. The speech pattern accompanying this pattern is slow to moderate, minimal in inflection, and not clipped. An individual displaying Type B behavior may be as intelligent and ambitious as his/her Type A counterpart, but his/her drive is accompanied by confidence and security rather than the hostility and insecurity characteristic of the Type A individual (Friedman & Rosenman, 1974; Rosenman & Chesney, 1982). The proportion of those with the Type A Behavior Pattern in any given sample is about 50%; the proportion of those with the Type B Behavior Pattern is

about 40%. Individuals exhibiting a mixture of Type A and B behaviors (the Type X Behavior Pattern) comprise about 10% of any given sample of subjects (Friedman & Rosenman, 1974; Rosenman, 1978). Friedman and Rosenman (1974) assert that "most Americans are in fact either Type A or Type B, though in varying degrees" (p. 85) and that as assessment procedures are refined, the number of individuals classified as Type X will decrease.

It is important to note that the Type A Behavior Pattern is not a personality type, but rather a set of behavioral responses resulting both from certain personal predispositions and from environmental challenges (Rosenman & Chesney, 1982). It should also be distinguished from anxiety states and stress (Rosenman & Chesney, 1980, 1982) Anxious individuals retreat from challenges while individuals displaying Type A behavior, by definition, respond actively to challenges. Likewise, the Type A Behavior Pattern "is neither a stressor situation nor a distressed response but a style of overt behavior used to confront life situations" (Rosenman & Chesney, 1982, p. 549).

The Relationship Between Type A Behavior Pattern and CHD

In an initial study of the Type A Behavior Pattern (Friedman & Rosenman, 1974), 80 men possessing the Type A Behavior Pattern and 80 men possessing the Type B Behavior

Pattern were examined. Although all of the subjects seemed healthy, were in the same age range (thirty-five to sixty years old), and had almost identical diets and exercise habits, the men with Type A behavior had higher serum cholesterol levels than the men with Type B behavior. Perhaps more ımpressively, 28 percent of the seemingly well Type A men already had CHD as opposed to 4 percent of the Type B men. A subsequent comparison of Type A and Type B Behavior Patterns among women (Friedman & Rosenman, 1974) revealed a similar tendency towards higher serum cholesterol levels and CHD among the Type A women.

Friedman and Rosenman (1974) noted that although the Type A women in the study described above suffered as much from CHD as their male counterparts in the previous study, there were and are proportionately fewer American white females with Type A Behavior Pattern as compared to males They attributed this to the lower proportion of females in the work force and predicted a rise in rates of Type A Behavior Pattern and CHD in women as thıs proportion increases. These authors note that ". . . ever since General MacArthur 'liberated' the Japanese female from her previous domestic ısolation, her incidence of coronary heart disease has quadrupled" (p. 79) and insıst that thıs increase cannot be explained by any sıgnificant change in diet, cigarette smoking, or exercıse. Subsequent research (Baker, Dearborn, Hastings, & Hamberger, 1984, Chesney & Rosenman, 1980) has revealed that the Type A Behavior

Pattern is as prevalent among women as among men when occupational and socioeconomic status are controlled.

Additional support for a relationship between Type A behavior and CHD has come from prospectıve research. In the Western Collaborative Group Study (WCGS), 3,154 men who were 39 to 59 years old and did not have CHD at ıntake (1960-61) were assessed for all risk factors and followed up at 8.5 years (Rosenman, Brand, Jenkins, Friedman, Straus, & Wurm, 1975; Rosenman, Brand, Sholtz, & Friedman, 1976). Follow-up revealed that 257 men had developed CHD (Rosenman et al., 1975; Rosenman et al., 1976) and that those classified as Type A at intake were 2.37 times more lıkely to have CHD by follow-up than those classified as Type B (Rosenman & Chesney, 1982). Furthermore, when the other, traditional risk factors (i.e., an animal-fat diet, smoking, lack of exercise, obesity, high blood pressure, and serum cholesterol) were held constant, those 39 to 49 year olds classified as Type A at intake were still 1.87 times more likely to have CHD by follow-up at all levels of other risk factors than those classified as Type B, in the 50 to 59 year old group, the relative risk was 1 98 (Rosenman et al., 1975). In other words, the majority of the dıfference in CHD incıdence between Type A and Type B individuals was attributable to behavior pattern, not to traditional risk factors.

In another prospective study, the Framıngham Study (Haynes, Feinleib, & Kannel, 1980), 39 to 49 year old men

with Type A Behavior Pattern were 1.9 times more likely to develop CHD than 39 to 49 year old men with Type B Behavior Pattern; 50 to 59 year old men with Type A Behavior Pattern were 2.1 times more likely to develop CHD than 50 to 59 year old men with Type B Behavior Pattern. These proportions are similar to those found by the WCGS. They are also similar to each other, suggesting that the risk associated with Type A behavior does not change with age (Rosenman & Chesney, 1982).

Since the 1,822 subjects in the Framingham Study included females, it also provided prospective support for a relationship between Type A Behavior Pattern and CHD among women. At an 8 year follow-up, Type A women were 3.32 times more likely to have angina and 2.14 times more likely to have had a myocardial infarction than Type B women.

The mechanism by which the Type A Behavior Pattern leads to CHD is still speculative, but at least two modes have been proposed for which there is mounting evidence. First of all, Type A behavior may contribute to fatal coronary events (Rosenman & Chesney, 1982). Sudden coronary death, such as that mentioned earlier which was experienced by Pearl Pizzamiglio, may occur when psychological stress and subsequent sympathetic nervous system arousal triggers ventricular fibrillation (Lown & Verrier, 1976). It is interesting to note that subjects with the Type A Behavior Pattern respond to challenging tasks with increased adrenergic output (Dembroski,

MacDougall, Shields, Petitto, & Lushene, 1978) and that subjects with CHD typically exhibit increased adrenergic output as well (Nestel, Verghese, & Lovell, 1967).

Secondly, Type A behavior may be linked to CHD through increased risk of coronary thrombosis (Rosenman & Chesney, 1982). Psychological stress is associated with increased blood clotting (Friedman, Rosenman, & Carroll, 1958) and with myocardial infarction which results from coronary thrombosis (Rosenman & Chesney, 1980). Similarly, both psychological stress and the Type A Behavior Pattern are associated with increased blood platelet aggregation (Haft & Fani, 1973; Jenkins, Thomas, Olewine, Zyzanski, Simpson, & Hames, 1975). In addition, Type A behavior is correlated with the severity of coronary atherosclerosis (Blumenthal, Williams, Kong, Schanberg, & Thompson, 1978; Frank, Heller, Kornfeld, Sporn, & Weiss, 1978; Zyzanski, Jenkins, Ryan, Flessas, and Everist, 1976) and with its progression (Krantz, Sanmarco, Selvester, & Matthews, 1979), even after statistically controlling for the effects of other risk factors.

Researchers continue to investigate the physiological processes associated with the Type A Behavior Pattern. However, treatment and prevention of CHD does not have to wait until such physiological processes are identified. Specific components of the pattern have been identified which are readily modifiable. These include impatience, competitiveness, aggressiveness, time urgency, hostility,

rapid/emphatic/clipped speech, and attempts to do more and more in less and less time (Friedman & Rosenman, 1974; Rosenman & Chesney, 1980, 1982)

It is not surprising that the Type A Behavior Pattern and CHD are more prevalent in industrialized, urban areas than in rural areas (Rosenman & Chesney, 1980, 1982; Sigler, 1958), in the United States than in Europe (Keys, Aravanis, Blackburn, van Buchem, Buzina, Djordjevic, Fidanza, Karvonen, Menotti, Puddu, & Taylor, 1972), and in the Framingham men in England than in Yugoslavians (Kozarevic, Pirc, Racic, Dawber, Gordon, & Zukel, 1976), in Puerto Ricans or Hawaiians (Gordon, Garcia-Palmieri, Kagan, Kannel, & Schiffman, 1974), or in Parisians (Ducimetiere, Cambien, Richard, Rakotovao, & Claude, 1980). It is also not surprising that little correlation between Type A behavior and age has been found, with the exception of a lower rate of Type A Behavior Pattern at younger ages before occupational challenges exist (Gordon & Verter, 1969; Shekelle, Schoenberger, & Stamler, 1976). Finally, the lower incidence among women generally, but the comparable rates for women and men when occupational and socioeconomic factors are held constant (Baker et al., 1984; Chesney & Rosenman, 1980) are to be expected.

Jenkins (1976) reviewed a number of studies assessing the relationship of psychosocial factors such as social class and status, educational level, religion, ethnic background, marital status, occupation,

work overload, social and geographic mobility, status incongruity, anxiety, neuroticism, life events and change, life satisfactions and dissatisfactions, and emotional loss and deprivation to CHD. Some of these psychosocial factors were found to be related to CHD, but few causal relationships were established. Furthermore, the relationship of these factors to CHD becomes more complex when their relationship to the Type A Behavior Pattern is also considered. This pattern has been correlated with social class, level of education, and occupational status (Rosenman & Chesney, 1980; Waldron et al., 1977) and with career advancement and achievement (Waldron et al., 1977). Higher rates of the pattern have been found among white-collar compared to blue-collar workers (Howard, Cunningham, & Rechnitzer, 1977; Rosenman, Bawol, & Oscherwitz, 1977; Shekelle et al., 1976), among white compared to black subjects in Chicago (Shekelle et al., 1976), and among Caucasian compared to Japanese-American male subjects in Hawaii (Cohen et al., 1975).

As was noted earlier in the description of the Type A Behavior Pattern, it must be distinguished from psychopathology (Rosenman & Chesney, 1980, 1982). Thus, as would be expected, Type A behavior is not correlated with anxiety or somatic complaints (Chesney, Black, Chadwick, & Rosenman, 1981). Furthermore, only small correlations between Type A Behavior Pattern and standard psychological tests have been found (Chesney et al , 1981), and no

correlations with psychopathology have been observed (Rosenman & Chesney, 1980, 1982). Indeed, many aspects of the Type A pattern are socially accepted, even rewarded (Chesney et al., 1981; Friedman & Rosenman, 1974; Rosenman & Chesney, 1982).

On the other hand, correlations have been found between Type A Behavior Pattern and job stresses (Caplan & Jones, 1975). Returning to the earlier description of the pattern as ". . . a style of overt behavior used to confront life situations" (Rosenman & Chesney, 1982, p. 549), the relationship to stress makes intuitive sense. Rosenman and Chesney (1982) indicate that Type A behavior emerges as a response to perceived environmental challenges, and job stresses are part of the environmental milieu. However, these authors point out that the behavior also emerges as a result of personal predisposition. It would be difficult, if not impossible (and undesirable, in the case of positive stressful life events), to remove all environmental challenges. The crux, then, in modifying the Type A Behavior Pattern to prevent CHD involves modifying the dispositional components of this pattern.

Components of the Type A Behavior Pattern

The specific components of the Type A Behavior Pattern noted earlier, including competitiveness, impatience, aggressiveness, rapid/emphatic/clipped speech, a sense of time urgency, trying to do more and more in less and less

time, and free-floating hostility (Friedman & Rosenman, 1974; Rosenman & Chesney, 1982), are based on the clinical observations of Friedman and Rosenman (1974). Numerous studies (Burnam, Pennebaker, & Glass, 1975; Matthews & Angulo, 1980; Van Egeren, 1979) have attempted to validate these components experimentally. Of the specific components of the Type A Behavior Pattern, competitiveness and hostility are pivotal factors. It is possible, as found in a study of Japanese subjects, to be hurried, hard working, and achievement oriented without manifesting competitiveness, anger, and subsequent susceptibility to CHD (Cohen et al., 1975). Furthermore, some authors are currently challenging the link between CHD and any of the components of the Type A Behavior Pattern except hostility, claiming that hostility is the key factor (Dembroski et al., 1985, Katz & Toben, 1986).

Friedman and Rosenman (1974) note that individuals with the Type A Behavior Pattern often seek each other out socially, despite the fact that their hostility tends to convert their social meetings into battles. A study by Van Egeren (1979) demonstrated that Type A individuals do indeed exacerbate hostile responses in one another. In that study, college students were allowed to choose whether to cooperate, compete, punish, reward, or withdraw as they communicated with a partner in a mixed-motive game. Students were paired according to one of six possible dyads (AA males, AB males, BB males, AA females, AB females, and

BB females) and then communicated by pressing buttons that could send 55 possible messages to their partners. AA dyads' messages included more threats and angry feelings and more refusals of both partners' messages and requests than those of AB or BB dyads.

Van Egeren (1979) also found no sex differences On the other hand, Type A women in the Framingham Study (Haynes et al., 1980; Haynes, Feinleib, Levine, Scotch, & Kannel, 1978) showed both manifestation and suppression of anger, manifestation of hostility decreased while suppression increased with increasing age. No correlation was found between Type A behavior and anger for men. It is not surprising, then, that Williams, Haney, Lee, Kong, Blumenthal, and Whalen (1980) found an independent relationship between CHD and each of those two variables, Type A behavior and hostility. Similar evidence of a relationship between hostility and CHD has been found by other investigators (Barefoot, Dahlstrom, & Williams, 1983; Shekelle, Gale, Ostfeld, & Oglesby, 1983).

The consistent relationship between hostility and CHD and the somewhat inconsistent relationship between hostility and the Type A Behavior Pattern has recently lead some authors (Dembroski et al., 1985; Katz & Toben, 1986) to challenge the relationship between CHD and any of the Type A Behavior Pattern components except hostility. Furthermore, some investigators have begun to focus on the modification of hostile responses (Levenkron et al , 1983)

In the quest to modify hostility (Levenkron et al., 1983; Suinn, 1977), subjects have been taught strategies for avoiding becoming angry by avoiding anger-inducing situations and/or for moderating responses resulting from hostility such as negative thought patterns and muscle tension. However, an alternative approach which has not yet been addressed is the identification of responses which are specifically incompatible with hostile responses and could replace them.

Humor as an Incompatible Response

The idea that humor affects health is not a new one. Both positive and negative views of the psychological and physical impact of laughter and humor are known to have existed since the time of Plato (Goldstein, 1987; Middleton, 1986). Negative views have included the belief during the Middle Ages that the seat of laughter (a "low" form of behavior) was the spleen. The Pilgrims who settled America viewed laughter with disdain. Even Freud, who acknowledged that humor can be liberating, noted the hostility, bitterness, and anxiety which can lie beneath it. On the other hand, positive views have included the belief by some, such as the 16th century physician named Mulcaster, that laughter is a healthy form of exercise. Indeed, Goldstein (1987) notes steady support for the healthful effects of laughter in the medical literature of the 18th and 19th centuries. Recently, Allport (1956)

noted, "The neurotic who learns to laugh at himself may be on the way to self-management, perhaps to cure" (p. 92)

Nevertheless, empirical support for the possible positive effects of laughter and humor on health is still lacking, despite the growing field of psychophysiology and the widespread interest in humor and health generated by books like Anatomy of an Illness (Cousins, 1979). Cousins wrote of his recovery from ankylosing spondylitis and attributed his recovery to watching humorous movies and taking massive doses of vitamin C. Still, although there are over a thousand studies of humor and laughter currently in existence, studies addressing the long-term effects of humor and of its absence or the physiological consequences of repeated or prolonged laughter are almost nonexistent (Goldstein, 1987).

However, evidence which exists so far is promising. Studies by Averill (1969) and Goldstein et al. (1975) suggest that laughter of brief duration can reduce the autonomic arousal characteristic of stress. Fry (1979) has noted that this characteristic of laughter suggests its potential for reducing stress related to heart disease. Furthermore, Mantell and Goldstein (1985) have proposed that individuals with the Type B Behavior Pattern may possess a sense of humor in place of the anger and hostility of those with the Type A Behavior Pattern.

Mantell and Goldstein's (1985) assertion that humor replaces hostility in Type B individuals suggests the

response which is incompatible with the hostility of Type A individuals and could replace it, but not without a caveat Goldstein (1987) describes how Freud noted that hostility can form the basis of humor and points out that laughter may result from self-deprecation or hostility towards others, neither of which may be healthy or desirable. And indeed, the hostility of the Type A Behavior Pattern may actually manifest itself in humor based upon hostility towards others. Indirect evidence of hostility expressed as humor can be found in the nonverbal expression of emotion by those engaging in the Type A Behavior Pattern. Friedman et al., (1984) note that if and when these individuals laugh, the laughter tends to be forced, short, and explosive instead of a belly laugh and is accompanied by a "strange twist to mouths" (p. 156).

Furthermore, Martin and Lefcourt (1984) note that "The most dour individual could very conceivably rate certain jokes as very funny simply on the basis of demand characteristics" (p. 146). These authors point out that historically, research of individual differences in humor has focussed on peoples' appreciation of humorous material (usually jokes or cartoons) and has been vulnerable to demand characteristics while revealing little about the role of humor in peoples' everyday lives. Thus, the humor which could potentially replace the hostility of the Type A Behavior Pattern ought to be based upon a general propensity toward humor, independent of type (e.g.,

aggression, incongruity, etc) and capable of assessment without influence by social desirability response bias

Summary

The concept of mind/body interaction, and in particular, the concept of psychosocial factors associated with CHD, is not new (Murray, 1983, Rosenman & Chesney, 1982). However, recent scientific rigor applied to studies of the relationship has provided more detailed information than was previously available. For example, a relationship between the Type A Behavior Pattern and CHD was discovered (Rosenman & Chesney, 1982). More recently, research has suggested that one particular component of the Type A Behavior Pattern, hostility, is at the core of the relationship between psychosocial factors and CHD (Dembroski et al., 1985; Katz & Toben, 1986).

Attempts to treat or prevent heart disease by modifying hostility have focussed on teaching subjects to avoid anger-inducing situations and/or to moderate hostile responses such as negative thoughts and muscle tension (Levenkon et al., 1983; Suinn, 1977) However, another approach, identifying and then teaching responses which are incompatible with hostile responses, would seem to be an appropriate alternative. One such possible incompatible response is humor Although research providing empirical support for the positive effects of humor on health is lacking (Goldstein, 1987), findings to date are promising

(Averill, 1969; Goldstein et al., 1975).

However, humor has historically been measured by assessing an individual's appreciation for humorous material (Martin & Lefcourt, 1984). Since it is possible that the hostility of the Type A Behavior Pattern may actually be expressed through humor (Friedman et al., 1984), hostility and humor could become confounded in traditional measures of sense of humor. Furthermore, social desirability response bias could account for supposed appreciation of humorous material (Martin & Lefcourt, 1984). Thus, the quantitative approach of Martin and Lefcourt (1984) in which they assess the frequency with which people experience humor seems to be a more appropriate basis for assessing the sense of humor of individuals engaging in the Type A Behavior Pattern.

CHAPTER III

METHODOLOGY

This chapter describes the experimental methods and procedures which were used in this study. Included are sections dealing with the following areas: subjects, procedures, ınstrumentation, research design, and data analysis.

Subjects

The sample used in this study was drawn from social science classes at a large junior college located ın an urban area in the southwestern United States. Subjects were obtained by randomly selecting classes from which volunteers were recruited. Informed consent (see Appendix A) was obtained from each volunteer prior to participation in the study.

Based on procedures described by Cohen and Cohen (1983), it was determined that a minimum of 150 subjects would have to particıpate in the study to provide a .80 level of power sınce an alpha of .05 would be used, two independent variables would be assessed, and an effect size of $f^2 = .10$ was assumed. Data were collected from 159 subjects, but eight were deleted because of missing data on

the criterion and/or predictor variables Consequently, the actual sample size was 151 subjects.

Of the 151 subjects, 114 were female (75.5%) and 37 were male (24.5%). Ages ranged from 17 to 49 years old with a mean of 26.8 and a standard deviation of 8.3 years. One hundred and eighteen subjects were Caucasian (78 1%), 15 were Black (9.9%), two were Native American (1.3%), nine were Hispanic (6.0%), three were Asian (2.0%), and four did not provide information about their ethnic background.

Concerning educational background, 22 subjects had completed high school (14.6%), 49 had completed one year of college (32.5%), 51 had completed two years (33.8%), 23 had completed three years (15.2%), two had completed a bachelor's degree (1.3%), three had completed some graduate work (2.0%), and one did not report education attained. The mean reported GPA was 2.89 with a standard deviation of .63.

Seventy-nine of the subjects reported that they were single (52.3%), 52 reported that they were married (34.4%), 17 reported that they were divorced (11.3%), two reported that they were separated (1.3%), and one subject did not report marital status. None of the subjects reported a history of heart disease.

Subjects were asked to indicate their current occupations and, if they indicated that they were fulltime students, their previous occupations. Subjects were also asked to indicate their projected occupations. Their

responses were grouped according to the ten major occupational categories in the Dictionary of Occupational Titles (1977) and are summarized in Table 1.

TABLE 1

FREQUENCIES REPORTED BY RESPONDENTS OF OCCUPATIONS

	Current Occupation	Previous Occupation	Projected Occupation
Occupation	n	n	n
Professional, technical, managerial	20	12	125
Clerical, sales	28	10	7
Service	30	19	3
Agricultural, fishery, forestry	0	0	0
Processing	0	1	0
Machine trades	0	0	0
Benchwork	0	0	0
Structural work	2	1	0
Miscellaneous	1	1	1
Unknown/ unidentifiable	7	4	14
Fulltime student	63	15	1
Totals	151	63	151

Procedure

Prior to asking for volunteer participants, permission was obtained both from an institutional review board and from individual instructors at a large southwestern junior college. Subjects were then solicited from randomly selected classes at the junior college by asking students to volunteer to be participants in a study investigating the relationships among behavior, sense of humor, and anger. They were told that students who volunteered to participate would immediately be given four brief questionnaires: the JAS, the SHRQ, the NAS, and a demographic questionnaire assessing age, gender, race, level of education, personal health history, marital status, GPA, and occupational status.

Volunteer participants who gave their informed consent (see Appendix A) completed the four questionnaires in a group format in their respective classrooms. The order of presentation of the four questionnaires was randomly varied to control for order effect. Finally, subjects were mailed a summary of the results of the study if they had indicated on their consent form that they wanted to receive such a summary.

Instrumentation

Demographic questionnaire. Demographic information was gathered from each subject on the following variables

age; gender; race; educational level; a brief, personal health history (including cardiovascular heart disease); marital status, GPA; and occupational status (see Appendix B).

Jenkins Activity Survey (JAS). The JAS is composed of 52 items which provide four scores, one for the composite Type A scale and three for the subscales (speed and impatience, job involvement, and hard-driving) (Jenkins, Rosenman, & Friedman, 1967). For the purpose of this study, only the score from the Type A scale was used.

This self-report questionnaire was developed based upon the Structured Interview (SI) (Jenkins et al., 1967), an assessment instrument designed to assess the Type A Behavior Pattern. However, despite high levels of interrater agreement, stability over time, and a strong relationship to CHD, the SI is described by researchers (Chesney et al., 1981; Rosenman & Chesney, 1982) as somewhat subjective, time-consuming, and costly. Of several available alternatives, the widely-researched JAS (Katz & Toben, 1986; Rosenman & Chesney, 1982) is the most appropriate.

Assessment of the Type A Behavior Pattern using the JAS is both reliable and valid. Both internal consistency and test-retest estimates of reliability have been computed for the JAS Type A scale according to Jenkins, Zyzanski and Rosenman (1979). These authors report that internal consistency reliability coefficients for the Type A scale

derived by two different approaches were .83 and .85 They also report test-retest reliability coefficients ranging from .65 to .82 after a four to six month interval.

The validity of the JAS has been established in a number of ways, including through comparisons with the SI. Glass (1977) found that by using the top and bottom quintiles of the JAS, resulting classification of subjects was quite similar to classification based upon the SI ($r = .88$ to .91), and Zyzanski and Jenkins (1970) found 72% agreement between the JAS Type A scale and the SI rating. Furthermore, scores on the JAS Type A scale have predicted the development of CHD (Jenkins, Rosenman, & Zyzanski, 1974), reinfarction (Jenkins, Zyzanski, & Rosenman, 1976), and extent of atherosclerosis (Zyzanski et al., 1976), although not quite as well as the SI.

Situational Humor Response Questionnaire (SHRQ). The SHRQ is composed of 21 items which provide a measure of the frequency with which people experience humor--a quantitative approach to sense of humor (Martin & Lefcourt, 1984). These authors point out that traditional humor research has assessed appreciation of certain types of humor--a conformist approach to sense of humor. They note that this approach is vulnerable to social desirability response bias and provides little information about the actual role of humor in daily life. Their solution was to develop the SHRQ which directs the respondent's attention towards the humorousness of situations rather than towards

their own internal qualities, focusses on situations in which laughter is relatively unusual, and emphasizes experiential indexes of humor.

Studies of both reliability and validity have provided promising results (Martin & Lefcourt, 1984). The SHRQ appears to be internally consistent. Cronbach alphas range from .70 to .83, and item-total correlations range from .28 to .53 for four samples. A test-retest reliability coefficient for a one month period was .70, with no differences between males and females.

Correlations calculated between scores on the SHRQ and on a social desirability scale (.04 for the total sample, .01 for males, and .16 for females) indicate freedom from social desirability response bias and, therefore, suggest divergent validity. Further evidence of divergent validity was suggested by low negative correlations between a measure of depression and tension and the SHRQ (-.25 for the total sample, -.27 for males, and -.24 for females).

Evidence of convergent validity was demonstrated by calculation of correlation coefficients between scores on the SHRQ and the frequency of laughter during an interview ($r = .30$ for the total sample, $r = .52$ for males, and $r = .39$ for females), the duration of laughter during an interview ($r = .46$ for the total sample, $r = .62$ for males, and $r = .40$ for females), a measure of positive affect ($r = .53$ for the total sample, $r = .69$ for males, and $r = 36$ for females), and peer ratings of sense of humor

(r = 30 for the total sample, r = .25 for males, and r = 34 for females). Further evidence of convergent validity for one or both sexes was found in comparisons between scores on the SHRQ and production of impromptu comedy routines, ratings of the humorousness of this routine, and ratings of the humorousness of a narrative produced while watching a stressful film. These studies (Martin & Lefcourt, 1984) provided greater support for the validity of the SHRQ for males than for females. Martin and Lefcourt suggest that this may be due to a restriction in variability in the females' scores on several of the measures, noting that overall, the evidence supports the validity of the SHRQ for both sexes.

Novacco Anger Scale (NAS). The NAS is composed of 90 items which provide a measure of specific anger reactions to provocation (Novacco, 1975). The author of this scale notes that ". . . the failure to cope effectively with provocation stress can be particularly tragic, as it can result in the alienation of loved ones, disrupted work performance, and even cardiovascular disorder" (p. xi). Notably, Katz and Toben (1986) used the NAS and found a significant relationship (using an alpha level of .05) between anger proneness and both cardiac reactivity and the Type A Behavior Pattern.

Friedman and Rosenman (1974) describe the hostility of individuals that they have worked with who displayed the Type A Behavior Pattern and report that they ". . . showed

an easily aroused hostility, which was likely to flare up under very diverse conditions" (p. 75). Novacco (1975) notes that previously developed methods of assessing hostility usually focus on what people do when angry rather than on what provokes anger. Furthermore, even those scales which tap anger proneness typically contain a very limited range of situations. Therefore, Novacco developed the 90 statements of provocation incidents which became the NAS, and he based many of the items on information from interviews with students about what makes them angry.

While little information related to the reliability and validity of the NAS has been reported, the results of two studies provide evidence that the NAS yields reliable and valid measures. The NAS has been shown to be internally consistent with Cronbach alpha coefficients of .94 for males and .96 for females (Novacco, 1975). Furthermore, the relationship found by Katz and Toben (1986) between anger as assessed by the NAS and the Type A Behavior Pattern implies convergent validity for the NAS

Research Design

The design utilized in this study was a correlational design (Campbell & Stanley, 1966). This was an initial investigation of the relationship of humor to the Type A Behavior Pattern, and, as Campbell and Stanley note·

> . the relatively inexpensive correlational approach can provide a preliminary survey of hypotheses, and those which survive this can then be checked through the more expensive experimental manipulation. (p. 64)

Analysis of Data

An alpha level of .05 was used along with a simultaneous multiple regression analysis of the data in this study. The dependent variable was Type A Behavior Pattern. The independent variables included sense of humor and anger. The power of the analysis was also calculated using a formula provided by Cohen and Cohen (1983).

Summary

This chapter described the experimental methods and procedures which were used in this study. One hundred and fifty-one subjects were obtained by recruiting volunteers from randomly selected social science classes at a large southwestern junior college. Four brief questionnaires, which included the JAS, the SHRQ, the NAS, and a demographic questionnaire, were administered to the subjects in a group format. The results of the demographic questionnaire provided a description of the subject characteristics. Finally, the research design and data analysis techniques chosen for this study were described, along with the rationale for choosing them.

CHAPTER IV

RESULTS

Introduction

The results of the statistical analysis of the data pertaining to the hypothesis being tested in this study are presented in this chapter. The purpose of the study was to determine if measures of hostility and of sense of humor are significant predictors of Type A Behavior Pattern To that end, a simultaneous multiple regression was utilized Tabachnick and Fidell (1983) suggest that to avoid finding a significant regression solution as an artifact of the case-to-variable ratio, "Ideally, one would have 20 times more cases than [independent] variables" (p. 91). With 151 subjects and two predictor variables, there appears to be no danger of this artifact in the present study.

Tests of assumptions of normality, linearity, homoscedasticity, multicollinearity, and singularity were conducted. Examination of both a histogram and a normal probability plot of standardized residuals suggests that the assumption of normality was supported. The spread of the differences between observed and predicted values on measures of behavior pattern, hostility, and sense of humor

is homogenous, indicating that the assumption of homoscedasticity was met. Furthermore, the scatterplot of these differences provides support for the assumption of linearity. Finally, an inspection of the tolerances and a simple correlation matrix calculated between the two predictors (see Table 2) indicates that the assumptions of

TABLE 2

SIMPLE CORRELATIONS CALCULATED BETWEEN SENSE OF HUMOR, HOSTILITY, AND THE TYPE A BEHAVIOR PATTERN

n = 151

	SHRQ	NAS
NAS	-.037	
JAS	.031	.204*

Note. SHRQ = Situational Humor Response Questionnaire; NAS = Novacco Anger Scale; JAS = Jenkins Activity Survey.

*p < .05.

multicollinearity and singularity were met.

In addition to the above theoretical considerations, a practical matter, outliers, was also addressed. An

inspection of the standard residuals indicated that the ten worst outliers fell within three standard deviations of the mean, which according to Tabachnick and Fidell (1983) is an acceptable range.

Test of the Hypothesis

The null hypothesis states that there is no significant relationship between behavior pattern and a linear additive combination of the variables of sense of humor and anger among junior college students. A simultaneous multiple regression analysis between behavior pattern and the two independent variables was performed to determine the predictive contributions of hostility and sense of humor. A significant multiple correlation of .2074 [$F(2,148) = 3.32$, $p = .04$] was obtained between the criterion and predictor variables, resulting in rejection of the null hypothesis. An overall R^2 of .0430 was obtained, indicating that the predictor variables account for about 4% of the variance in the criterion variable.

The only predictor variable for behavior pattern found to be statistically significant was hostility (beta = .2052). The squared semipartial correlation coefficients suggest that hostility accounts for about 4% (.0420) of the total variance in behavior pattern beyond that accounted for by sense of humor while sense of humor accounts for less than 1% (.0015) of the total variance in behavior pattern beyond that accounted for by hostility. Means and

standard deviations for both the predictor and the criterion variables are given in Table 3.

TABLE 3

MEAN SCORES AND STANDARD DEVIATIONS FOR SENSE OF HUMOR, HOSTILITY, AND THE TYPE A BEHAVIOR PATTERN

n = 151

Variables	Mean	Standard Deviation
SHRQ	50.10	9.18
NAS	310.47	50.94
JAS	230.16	66.75

Note. SHRQ = Situational Humor Response Questionnaire; NAS = Novacco Anger Scale; JAS = Jenkins Activity Survey.

Following the statistical analysis of the data using multiple regression, a post hoc examination of potential suppressor variables was conducted. Comparison of the signs of simple correlations (see Table 2) between each predictor variable and the criterion variable with the signs of the beta values indicates that neither predictor

variable was a suppressor variable. In addition, an analysis of the actual level of power was performed. Based on an actual effect size of .04 (using the Cohen & Cohen, 1983, procedure and the sample R^2 as an estimate of the population R^2 to calculate the effect size), an alpha level of .05, and a sample size of 151, the power analysis revealed a level of .60.

Discussion

The overall results of the multiple regression are statistically significant; however, the predictors (hostility and sense of humor) account for so little variance (approximately 4%) in behavior pattern (Type A vs. Type B) as to be of little practical importance. Furthermore, hostility accounts for about 4% of behavior pattern variance while sense of humor does not significantly account for any behavior pattern variance. As Fagley (1986) has pointed out, "Nonsignificant results can be a potential contribution to knowledge [but] only when the power of the statistical tests was high and are ambiguous at best when the power of the statistical tests was low" (p. 391). As noted earlier, a power analysis revealed a power level of 60 for this statistical test, suggesting that the probability of detecting a meaningful effect was low since power should be at least .80 (Fagley, 1986). Therefore, the meaning of the lack of significant results for the unique contribution of sense of humor to

behavior pattern variance is, unfortunately, ambiguous Because the effect size was small and the power level was low, no conclusion can be drawn about the unique contribution of sense of humor to the prediction of behavior pattern.

Summary

This chapter described the results of the statistical analysis of the data pertaining to the hypothesis tested in this study. Tests of assumptions of normality, linearity, homoscedasticity, multicollinearity, and singularity suggested that each of these assumptions were met. A simultaneous multiple regression analysis between behavior pattern and the two independent variables, hostility and sense of humor, was significant. However, the only predictor variable found to be statistically significant was hostility, and it only accounted for about 4% of the variance in behavior pattern, which suggests little practical importance. A power analysis revealed a level of .60, suggesting that the probability of detecting a meaningful effect was low and that the meaning of the lack of significant results is ambiguous for the unique contribution of sense of humor.

CHAPTER V

SUMMARY, CONCLUSIONS, AND RECOMMENDATIONS

Introduction

This chapter presents a general perspective of the study and an interpretation of the results. General conclusions drawn from these results are discussed, and recommendations for future research in this area are provided.

Summary

The purpose of this study was to investigate whether Type A Behavior Pattern can be predicted using measures of hostility and sense of humor. Of particular interest was the contribution of sense of humor.

Subjects in this study were obtained from a population of junior college students enrolled in social science classes during the summer semester at a large southwestern junior college. There were 114 females and 37 males for a total of 151 subjects.

Data consist of the subjects' scores on tests measuring behavior pattern (the Type A scale of the Jenkins Activity Survey), hostility (the Novacco Anger Scale), and

sense of humor (the Situational Humor Response Questionnaire). In addition, demographic data were obtained by means of a questionnaire designed specifically for this study (see Appendix B). The research question and corresponding hypothesis were tested using multiple regression analysis of the data.

The null hypothesis states that there is no significant relationship between behavior pattern (Type A vs. Type B) and a linear additive combination of the variables of sense of humor and anger among junior college students in the southwestern United States. The multiple regression analysis between behavior pattern and the two predictor variables led to a rejection of the null hypothesis. Together, sense of humor and hostility are significant predictors of behavior pattern at the .05 level. When examined separately, however, hostility was found to be a significant predictor variable, but sense of humor was not. Furthermore, an analysis of power revealed that the results were affected by a low level of power.

Conclusions

Since assumptions of normality, linearity, homoscedasticity, multicollinearity, and singularity were met and since outliers fell within an acceptable range, it appears that it was appropriate to apply multiple regression analysis to this data set. Based on the results of the multiple regression analysis of the data, it is

concluded that the independent variables, hostility and sense of humor, are significant predictors of behavior pattern (Type A vs. Type B) when considered in a linear additive combination. Approximately 4% of the variance in behavior pattern is accounted for by these two predictor variables when considered together However, when considered separately, hostility significantly accounts for about 4% of the variance in behavior pattern while sense of humor does not significantly account for any of the variance.

Furthermore, the meaning of the lack of a statistically significant contribution by sense of humor is ambiguous. Calculations of actual effect size and power revealed that the effect size was small (.04) and that the subsequent level of power was low (.60). Consequently, both the conclusion that sense of humor isn't a predictor of Type A Behavior Pattern and the conclusion that the power of the analysis was too low to detect such a relationship although it existed are viable.

Based on the actual effect size and level of power calculated following the multiple regression analysis, it is concluded that either a larger alpha or else a larger sample size was needed to increase power. Since the larger of the two conventional levels of alpha was used, it appears that an increase in sample size would have been the key to increased power. Although sample size was calculated prior to collecting the data in order to obtain

a power level of .80, the estimate of effect size used in that calculation was larger than the actual effect size and resulted in a smaller sample size than was actually needed.

Finally, although hostility is a statistically significant predictor of variance in behavior pattern, the actual amount (4%) is small and of limited practical importance. Approximately 96% of the variance in behavior pattern is still unaccounted for.

Recommendations

The significant relationship overall between behavior pattern and the predictor variables, hostility and sense of humor, suggests that the critical component(s) of the Type A Behavior Pattern and the potential replacement(s) for it/them can be identified. In addition, the present study substantiates the relationship between Type A Behavior Pattern and hostility which has been found in previous studies (Dembroski et al., 1985; Katz & Toben, 1986).

On the other hand, the small proportion (4%) of variance in behavior pattern accounted for overall in the present study and the absence of any significant amount of variance in behavior pattern accounted for by sense of humor is disappointing Furthermore, interpretation of the nonsignificant results pertaining to sense of humor is hindered by the small effect size and the resulting low level of power Small effect sizes and low levels of power

are typical in behavioral science research and make interpretation of nonsignificant results difficult. One solution is to increase power by increasing sample size or alpha. In this study, the alpha used was already the larger of the two conventionally used levels. A larger sample size should be considered in replicating this study now that there is evidence that the effect size in the population is smaller than originally estimated.

Other factors which affect the interpretation of nonsignificant results include the validity and reliability of measures of the independent and dependent variables. As demonstrated earlier, there is evidence that all of the measures used in this study are both valid and reliable. However, it should be noted that when Katz and Toben (1986) found a relationship between hostility and Type A Behavior Pattern, they only used subjects whose scores were in the top and bottom quintiles on the JAS. The fact that some of the variance in behavior pattern, albeit a small amount, was predicted in this study by amount of hostility of subjects with JAS scores ranging across the full spectrum is gratifying. On the other hand, a larger amount of variance in behavior pattern might have been predicted by hostility--and for that matter, by sense of humor as well--if the data used in this multiple regression had only included subjects with extreme scores on the JAS. However, it should be noted that using only the data from subjects whose scores are in the top and bottom quintiles on the JAS

requires collecting data from a much larger number of people than the number of subjects one ultimately needs and discarding/wasting a huge amount of data. In addition, the generalizability of the results will be limited by this procedure. In a replication of this study, the possible benefits of looking only at the data of those with high or low scores on the JAS should be weighed against the high cost in terms of loss of data and limited generalizability.

Another concern related to the validity of the measures used in this study involves the potential for confounding humor with hostility in the form of disparaging humor, humor at the expense of others. Martin and Lefcourt (1984) developed the Situational Humor Response Questionnaire (SHRQ) which is a valid and reliable measure of ". . . a generalized propensity toward humor regardless of the type . . ." (p. 145). The SHRQ, therefore, is a potential solution to the possibility of confounding disparaging types of humor with the hostility of the Type A Behavior Pattern. However, the authors included at least one item which, if the situation elicits humor, results in amusement at another's expense ("If you were eating in a restaurant with some friends and the waiter accidently spilled some soup on one of your friends . . .", p. 150). Although a simple correlation coefficient calculated between the NAS and the SHRQ was not significant ($p > .05$) (see Table 2), further assessment of such possible confounding should be conducted before using the SHRQ for

future assessments of humor in those with the Type A Behavior Pattern. Indeed, Martin and Lefcourt (1984) indicate that ". . . items could be altered or replaced by other situations that might be more germane to other populations" (p. 154).

Furthermore, although there is evidence for the validity of the SHRQ for both sexes, there is less evidence of the validity of the questionnaire for women than for men, and the authors believe that this might be due to a restriction in variability in the women's scores. Since the majority of subjects in this study were female, the lack of evidence for a unique contribution from sense of humor in predicting behavior pattern may be due to a restriction in variability in the women's scores on the SHRQ rather than an actual lack of variability in senses of humor. It would seem prudent to examine the relationship between sense of humor and behavior pattern separately for men and women at the very least and perhaps to even try to find a valid and reliable measure of sense of humor with a wider range of scores for women.

It should be noted that until very recently, there has been a lack of valid and reliable measures of sense of humor. This may at least in part account for the lack of research on the relationship between sense of humor and Type A Behavior Pattern even though Friedman and Rosenman (1974) included quantitative and qualitative differences in sense of humor when comparing Type A and Type B Behavior

Patterns The SHRQ is a promising instrument for such research; its authors (Martin & Lefcourt, 1984) provide strong evidence of its validity and reliability, and the present study suggests that as a measure of humor, it is not confounded with hostility. However, as noted earlier, individual ıtems on the SHRQ and the impact of subjects' gender need to be studied further.

The fact that the majority of subjects in this study were female raises some additional issues. There is less variability in women's senses of humor generally than in men's as measured by the SHRQ in the original study (Martin & Lefcourt, 1984). Perhaps females with the Type A Behavior Pattern are different from males with the Type A Behavior Pattern on sense of humor. For example, perhaps there is no difference between women who engage in the Type A Behavior Pattern and women who engage in the Type B Behavıor Pattern on sense of humor while there is a difference between men who engage in either one or the other of the behavior patterns. On the other hand, it is worth noting that the mean SHRQ score for all subjects ın this study was 50.10 with a standard deviation of 9.18 whıle the mean SHRQ score for all subjects in the origınal study of the SHRQ (Martin & Lefcourt, 1984) was 59.6 with a standard deviation of 9.06. The somewhat larger variabilıty overall in this study wıth the subjects being predominantly female suggests that there is less difference on sense of humor between males wıth the Type A Behavior

Pattern and males with the Type B Behavior Pattern than there is between females with one or the other of these two behavior patterns. As noted earlier, future studies should examine the relationship between sense of humor and behavior pattern separately for men and women.

Another factor worth noting is that students who choose to attend school during the summer may differ in some significant way from the general student population. Perhaps, for example, students who attend school in the summer are generally more serious. As noted above, the mean SHRQ score in this study is approximately a standard deviation lower than the mean SHRQ score in the original study and suggests that the subjects in the original study of the SHRQ had greater propensity toward humor than the subjects in the present study.

In addition, the restricted variability found on demographic variables in this study might be a factor in the results obtained. As Gordon and Verter (1969) and Shekelle et al. (1976) have noted, age does not appear to be related to Type A Behavior Pattern with the exception of a lower rate at younger ages before occupational challenges exist. On the other hand, other characteristics such as level of education and occupational status are related to Type A Behavior Pattern (Rosenman & Chesney, 1980, Waldron et al., 1977).

Thus, the results suggest that sense of humor and hostility are significant predictors of Type A Behavior

Pattern when examined together. However, when examined separately, sense of humor is not a significant predictor of behavior pattern in this study. Furthermore, an analysis of power revealed a low level of power. Therefore, the meaning of the lack of significant contribution by sense of humor is ambiguous. Sense of humor may or may not be related to behavior pattern. Consequently, the issues raised above concerning subjects and instruments should be considered carefully when planning replications of this study.

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APPENDIX A

CONSENT FOR PARTICIPATION IN

A RESEARCH PROJECT

Thank you for volunteering to participate in this study. This is a study designed to assess how behavior, sense of humor and anger are related. In participating, we will ask you to complete a demographic form and to respond to three questionnaires It is anticipated that this will take approximately 30 minutes. Your participation is strictly voluntary, however, your decision to take time to complete the study will provide important information You may withdraw from participating in this study at any time for any reason whatsoever without penalty.

All information will be gathered in strict conformance with APA guidelines for human subjects' participation Your responses will be completely anonymous; no attempt will be made to attach your name to responses. The results of this study will only be reported as group data, not individual responses. This study is being conducted by Jean Birbilis, a doctoral student, under the supervision of Dr James Seals. If you should have any questions about this study, please contact either of us by calling Applied Behavioral Studies, Oklahoma State University, at (405) 744-6036. For information regarding legal rights as a research subject, please contact Terri McIula, Office of University Research Services, 001 Life Sciences East, Oklahoma State University, (405) 744-5700 We appreciate your cooperation and efforts.

I have read these instructions and understand my rights I further understand that this sheet will immediately be removed from the rest of the packet and that I will receive a copy of this form outlining my rights as a research participant. (After signing and turning in the consent form, please complete the three questionnaires)

(Signed)	(Witness)
(Date)	(Date)

___ Check here if you want feedback regarding the results of the study when they are available Include your mailing address only if you want this feedback. This page will be immediately detached from your responses

_____
(Name)

_____
(Address)

_____
(City, State, Zip)

APPENDIX B

DEMOGRAPHIC QUESTIONNAIRE

Please answer each of the following items.

1 Date of Birth: _____ Age: _____

2. Sex: F ___
M ___

3 Race: _____

4 Educational Attainment (indicate the highest):
12 years ___
13 years ___
14 years ___
15 years ___
Baccalaureate Degree ___
Some Graduate Study ___
Graduate Degree(s) ___

5 Personal Health History:
Please place a check mark next to any of the following health problems which you have experienced.
kidney disease ___
heart disease ___
asthma ___
stomach problems ___
frequent headaches ___
seizures ___
stroke ___
thyroid disease ___
diabetes ___
cancer ___
surgery ___
other (please specify) _____

6 Marital Status. _____

7 Overall College Grade Point Average (If this is your first college semester, please indicate) _____

8 Current Occupation (If you are not either employed outside of the home or else a homemaker, please put "student"): _____

If you answered "student" above and held an occupation prior to becoming a student, what was it? (If you were a fulltime homemaker, please put "homemaker"): _____

9 What is your projected career when you finish school?

_____

VITA

Jean Marie Birbilis

Candidate for the Degree of

Doctor of Philosophy

Thesis: THE RELATIONSHIP OF SENSE OF HUMOR AND HOSTILITY TO THE TYPE A BEHAVIOR PATTERN

Major Field: Applied Behavioral Studies

Biographical:

Personal Data: Born in Tulsa, Oklahoma, September 17, 1955, the daughter of Tom and Delma Birbilis.

Education: Received the Bachelor of Science degree in Psychology with a Teaching Certificate from Oklahoma State University at Stillwater in December, 1976; received the Master of Art degree in Clinical/Applied Psychology at the University of Tulsa at Tulsa in May, 1981; completed requirements for the Doctor of Philosophy degree at Oklahoma State University in July, 1990.

Professional Experience: Fieldwork, Tulsa Junior College, 1980; Fieldwork, Oral Roberts University Counseling Center, 1980-1981; Research/Clinical Associate, Center for Behavioral Medicine, Oklahoma College of Osteopathic Medicine and Surgery, 1981-1985, Behavioral Clinician, Pain Management Program, Hillcrest Medical Center, 1982-1984, Psychology Instructor, Tulsa Junior College, 1984-1989; Practicum, Kaiser Rehabilitation Center, 1987-1988; Practicum, Bi-State Mental Health Foundation, 1988-1989; Internship, University Counseling Services, University of Minnesota, 1989-1990; Instructor, North Hennepin Community College, 1990.

Professional Organizations: Associate Member of the American Psychological Association and the Association for Applied Psychophysiology and Biofeedback.