Humor, fitness, happiness, and cardiorespiratory after pulse as components of wellness

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Humor, fitness, happiness, and cardiorespiratory after pulse as components of wellness

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Iowa State University, 1991
Humor, fitness, happiness, and cardiorespiratory after pulse
as components of wellness

by

Kay Rutherford Bartels

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CHAPTER I. INTRODUCTION

Interest in the topic of wellness has been growing steadily since the 1960s when Americans began to show more interest and awareness of their need to be healthier, to exemplify less illness, and to have more control over their own bodies. The interest in wellness started with the idea of the "absence of illness" and has since progressed to the idea of a continual state of wellness growth. This wellness growth has been described as the movement from premature death (Travis & Ryan, 1988) and low-level-worseness (Ardell, 1977) to the end achievement of high-level-wellness. This movement of wellness growth is described as a broad, holistic, and ongoing process, which includes many areas; these areas are separate entities that work together as a harmonious whole. Halbert Dunn (1961) described wellness as being an interrelated, interdependent quality that encompasses the "whole human being." Sperry (1984) said that "well" persons are more than just the sum of their separate and individual parts. The interrelatedness of these various areas of wellness is an essential quality of the wellness entity.

Even though the interest in wellness research today has continued to expand, there is presently a lack of research found about the interrelatedness of certain specific wellness areas. This study has explored the interrelatedness of four of the many areas of wellness. The areas of wellness explored were the social, fitness, physiological, and emotional areas. The social area of wellness was examined by the concept of humor, the fitness area of wellness with the concept of Fitness History (FHx),
the physiological area of wellness with the concept of cardiorespiratory after pulse (CAP), and the emotional area of wellness with the concept of happiness.

Humor has been an intriguing concept for many years. Humor was called both a social obligation (Dreikurs, Sovola, McBurney, & Stahl, 1951) and an essential ingredient in Adlerian "social interest" (Adler, 1964b). It has been said that the sense of humor is valued so highly in American society that few people would admit to not having one (Treadwell, 1970). Although the entire wellness area continues to be a topic of research interest today, there is a need for the concept of humor, and its interrelatedness to other concepts of wellness, to be explored in greater depth.

Fitness has been one of the more inclusive concepts of wellness. The concept of fitness has included the past and present history of well or not well individuals. The fitness concept of individuals portrays the ongoing process of wellness. Are individuals fit (or well) due to active rather than passive roles? Are individuals fit because they have a healthy mental attitude? Are individuals fit because they have healthy habits and lifestyles? Does gender, age, and smoking history affect the fitness of individuals? There is a need for the concept of fitness, and its interrelatedness to other wellness concepts, to be explored.

The physiological concept of wellness has long been researched within the area of physical health, and it has been discussed in this study as cardiorespiratory after pulse (CAP). From a health perspective, CAP is the most important component of physical health (Anspaugh, Hamrick, &
Rosato, 1991) as it shows subjects' physical endurance by measuring their heart rate after exercise. The physiological area of wellness has been known and well respected, but its interrelatedness with other wellness areas has been explored and somewhat less developed. There presently exists a need to relate CAP with the other humor, Fitness History, and happiness concepts of wellness.

The happiness concept of wellness has been an area that society has shown great interest in since the early part of this century (Taylor, 1988). Bradburn (1969) explored the affective processes or moods involved in the study of happiness, and Andrews and Withey (1974) studied the needs and aspirations involved in happiness research. Even though the study of happiness has been growing, the interrelatedness of happiness with the wellness concepts of humor, Fitness History, and CAP needs to be explored in greater depth.

Is the well person more humorous? Is the well person happier? Do happiness and humor contribute to people's wellness? Are physically well persons happier and do they have a better sense of humor than physically unwell persons? These are the various questions of interest in this study. The wellness concepts of humor, Fitness History, CAP, and happiness and their interrelatedness are discussed in the following study.

Purpose of the Study

The purpose of this research was to examine the wellness concepts of humor, FHx, CAP, and happiness. The social, fitness, physiological, and emotional areas of wellness in this study are exemplified by the wellness
concepts of humor, FHx, CAP, and happiness. The research was initiated by hypothesizing a priori sources of humor, FHx, CAP, and happiness, developing and using various assessments, and collecting and analyzing data among exercise groups at Iowa State University.

Research Questions and Related Null Hypotheses

Four research questions were formulated in this study of wellness, including the wellness concepts of humor, FHx, CAP, and happiness:

1. Are there subcomponents (factors) of the Natural Setting Humor (Natural SH) instrument?
2. Are there subcomponents (factors) of the Fitness History (FHx) instrument?
3A. How reliable (consistent) are the responses to humor and FHx?
3B. Are there significant relationships within the variables assessing humor, FHx, CAP, and happiness?
3C. Are there significant relationships across the variables humor, FHx, and happiness?
   Ho 1: There are no significant relationships across the factors and component scores of humor, FHx, and happiness.
3D. Are there significant differences between humor, FHx, CAP, happiness, and the variables of marriage, children, gender, and individual questions?
   Ho 2: There are no significant differences between married and not married participants on the humor, FHx, CAP, and happiness scores.
Ho 3: There are no significant differences between those participants who have children at home and those who do not, on the humor, FHx, CAP, and happiness scores.

Ho 4: There are no significant differences between men and women participants on the humor, FHx, CAP, and happiness scores.

Ho 5: There are no significant differences between men and women participants on individual question scores on humor, FHx, CAP, and happiness scores.

3E. Are there significant differences between humor, FHx, CAP, happiness, and the variables of exercise groups, hours of exercise, and CAP categories?

Ho 6: Among the six exercise groups, the mean scores on humor factors and instruments, FHx factors and components, CAP, and happiness scores are the same.

Ho 7: There are no significant differences on selected humor factors and instruments, FHx factors and components, CAP, and happiness scores when considered by number of hours exercised.

Ho 8: There are no significant differences on Composite Humor scores and Composite Happiness scores when considered by CAP categories.

4. What selected factors, instruments, components of humor, FHx, CAP, and happiness can predict humor and CAP?
Ho 9: The components of marriage, the FHx factors of WAF and HAF, hours of exercise, children at home, reads comics, feels better with exercise, CAP, gender, age, and the physical appearance factor of happiness do not predict humor.

Ho 10: The components of marriage, the FHx factors of WAF and HAF, hours of exercise, children at home, reads comics, feels better with exercise, gender, age, and the physical appearance factor of happiness, do not predict CAP.

Definitions

1. **Wellness** - the ongoing, dynamic process of continual and steady growth in one's present state of health (Travis & Ryan, 1988). It is much more than just the absence or prevention of disease (Ardell, 1977, 1986). It is one's optimal striving to be as healthy as one can be. It is multidimensional with many concepts included in its entirety; these wellness concepts are interrelated (Adler, 1964c; Dunn, 1961; Ardell, 1986; Travis & Ryan, 1988).

2. **Humor** - the concept of social wellness that is exemplified by the ability to amuse others and/or the ability to laugh, neither of which may necessarily involve laughter or joking (Mosak, 1987).

3. **Fitness History (FHx)** - the concept of fitness within wellness that is exemplified by the past and present state of a person's wellness.
which, in turn, displays an ongoing wellness growth (Pollock, Wilmore, & Fox, 1978, 1984).

4. **Cardiorespiratory after pulse (CAP)** - the physiological area of wellness that is displayed by the heart rate of persons who have just exercised (Kasch & Boyer, 1968; Kurucz, Fox, & Mathews, 1969).

5. **Happiness** - the concept of the emotional area of wellness that is displayed by the state of well-being and contentment; a pleasurable satisfaction that exemplifies the state of being gratified and the overall appreciation of one's life as a whole (Veenhoven, 1984a).
CHAPTER II. REVIEW OF LITERATURE

The purpose of this review is to present an overview of four wellness areas; social wellness as exemplified by the concept of humor, fitness as exemplified by Fitness History, physiological wellness as exemplified by cardiorespiratory after pulse, and emotional wellness as exemplified by happiness. Each wellness concept is reviewed as a concept within itself and as a concept interrelated with the other concepts. A literature review of the all-inclusive area of wellness is presented first, with the wellness concepts of humor, Fitness History, cardiorespiratory after pulse, and happiness following. The literature review of the previous assessments used with each concept is presented following the wellness concept literature reviews.

Wellness in Totality

In the following literature review, the researcher explains what the total area of wellness entails. After wellness is discussed as a total area, the researcher examines the four individual wellness concepts of humor, Fitness History (FHx), cardiorespiratory after pulse (CAP), and happiness.

The concept of wellness has been discussed and examined in depth over the past 40 years; and even though it is a recent topic, a wealth of information about wellness has been formulated these 40 years.

Wellness has been described as an ongoing, dynamic process of continual and steady improvement in one's state of health. Wellness is much
more than just the absence or prevention of disease; it is one's optimal striving to be as healthy as possible. To reach that goal, one must examine and strive to improve in the many and varied conceptual areas of wellness. These wellness concepts have included such aspects as physical fitness, emotional and social well-being, intellectual and occupational satisfaction, stress management, nutritional awareness and practice, environmental sensitivity, and the personal concepts of moving, feeling, and thinking, etc. Frequently, wellness concepts are determined by one's own self-responsibility and by one's own set of cultural and normative values (Travis & Ryan, 1988; Ardell, 1986; Dunn, 1961; Anspaugh et al., 1991).

One of the first concepts to emerge began with the definition of wellness as the "prevention of disease" or "the absence of illness." This concept was pictorially presented by John Travis, M.D. (Travis & Ryan, 1988), and the use of his Illness/Wellness Continuum as shown below:

```
Premature death                High-level-wellness
A  B  C    |    D  E  F

Neutral point
(Absence of illness)
```

This continuum shows the progression of one's wellness improvement, as shown by the movement from premature death to absence of illness and, eventually, to high-level-wellness. The points on the continuum are as follows: A=Disability, B=Symptoms, C=Signs, D=Awareness, E=Education, and F=Growth. This emphasizes the idea that wellness is a dynamic and a continually growing entity. One may become "more well" each day with new
growth in one or more of the wellness concepts. What matters in wellness growth is which direction one is moving towards--premature death or high-level-wellness.

Len Sperry (1984) discussed wellness in its totality--the holistic aspect of wellness. He stated that the total person is active, creative, and more than just the sum of his separate and individual parts. He defined wellness as a dynamic state with forward movement toward a higher level of bodily functioning, in the context of a highly supportive lifestyle and environment. As persons grow more well, they are better able to listen to what their bodies are saying, to their mental self-talk, and to their spirits' need for balance and harmony. In a similar vein, Halbert L. Dunn, the author of "High Level Wellness" (1961), described wellness as "being alive clear to the tips of your fingers and clear to the tips of your toes" and as being interrelated, interdependent, and as encompassing the whole human being (p. 43).

Donald B. Ardell (1977) described "high-level-wellness" as:

...giving care to the physical self, using the mind constructively, channeling stress energies positively, expressing emotions effectively, becoming creatively involved with others, and staying in touch with the environment (p. 10).

Ardell said that wellness has five major dimensions: self-responsibility, nutritional awareness, stress management, physical fitness, and environmental sensitivity, which includes social interest (Appendix A, p. 154). In 1986, Ardell revised and listed the five components of wellness (Appendix A, p. 155) as self-responsibility and medical self-care; ethics,
values, and purposes; stress management and boredom immunity; nutrition and fitness; and cultural norms or rules.

John Travis and Regina Sara Ryan (1988) view wellness as consisting of 12 areas, which were conceptualized in a Wellness Wheel (Appendix B). The Wellness Wheel consists of the following areas: self-responsibility and love, breathing, sensing, eating, moving, feeling, thinking, playing/working, communicating, sex, finding meaning, and transcending. Travis and Ryan also encouraged the use of gentle compassion and "taking oneself lightly" during wellness training, and they encouraged the participants to be both happy "within" and "with" themselves.

The Adlerian counseling approach includes many wellness and holistic ideas. The Adlerian counselor views humans as responsible, self-directing, autonomous, and with a social-interest philosophy including three components in a person's lifestyle: love, friendship, and work. Adler believed that it was "the degree of social interest which determined the fate, the failure, or the possibility for happiness of a person" (Adler, 1964c, p. 58). The extent to which a person chose to maintain an interest in society affected the level of happiness sustained. It was thought that humor and happiness also indicated an individual's level of social interest (Adler, 1964c).

Other ideas in the wellness entity include stress reduction and eclecticism. Adlerians view stress as a challenge rather than as a defeat. Adlerians also encourage eclectism. Wellness is eclectic, as it is composed of many areas and many concepts.
In *Concepts and Applications Wellness* by Anspaugh et al. (1991), various wellness inventories are exemplified; for example, these areas include Health Locus of Control, Barriers to Change, Eating Behaviors, Effects of Smoking, Cardiovascular Risk-Factor Analysis, Fitness Walking Test, Stressors of Life, Stress Style, Hardiness Scale, Drinking Problems, Drugs in my Life, Sexually Transmitted Disease, and Cancer Awareness Inventory.

**Humor**

The researcher has found that the respectability and importance of humor as a research topic is often questioned and belittled by society. Thus, the researcher emphasizes the importance and respectability of humor in this study. The following humor review is divided into four sections including: 1) definition of humor, 2) types of humor, 3) humor in psychotherapy, and 4) the negative aspects of humor.

**Definition of humor**

What is a "sense of humor"? How is humor defined? Is the sense of humor something one does or is it something one has? These questions are answered in the following definitions, descriptions, and literature review. An attempt is made to give examples of humor and its use.

Treadwell (1970) said that in the American society, having a good sense of humor was valued so highly that few people would admit to not having one (cited in Mosak, 1987). Moody (1978) said that sharing jokes and laughing together accomplishes two objectives—it serves as a social lubricant and it enhances what Adler (1964b) called "social interest."
Levine and Rakusin (1959) said that the sense of humor encompasses the ability to amuse others and/or the readiness to laugh, and that the sense of humor was thought to be an attribute that someone "has."

Ed Sovola (1951) described his humorous experiences and how the general public reacted to them. Sovola said that when people laugh, they momentarily forget their troubles; then they try to participate and "enter into the thing." Humor helps people to do their work, to release their tension, and to go on. Sovola was particularly interested in audience participation. He took a worm's-eye view by climbing into a trash can and watching the debris come in. When an individual woman put something in the can, he said, "Thank you," which, of course, surprised the woman. When it was discovered that he was actually in the can, the woman laughed and they both chatted. This showed a reversal of something quite familiar, and the audience could imagine themselves in that situation. This was a vaudeville, slap-stick type of humor. When Sovola was asked if anybody tried to climb in the trash can with him he answered, "There isn't too much room in a trash can!" (Sovola, 1951, p. 7 [cited in Dreikurs et al., 1951]).

Dr. Dreikurs, an Adlerian psychiatric professor, reported that humor integrated a group. He said humor was contagious, and when people laughed together, they had a stronger feeling of cohesion.

When I have given a talk to an audience or to a group and I couldn't make them laugh, they were distant, but when they laughed, they were responsive, became a unit, and I have become a part of it.... If we were in an embarrassing situation, we
could elevate ourselves above that situation, if we could laugh. We could free ourselves from the impression that a situation is a "downer" if we could bring ourselves from an inferior position to a superior position in regards to that embarrassing situation or that fearsome task. Anyone without a sense of humor was socially inadequate. One had to have it to get along. A sense of humor was one of the means of getting along and enabled one to remain somewhat poised in dealing with it. It had almost become a social obligation (Dreikurs et al., 1951, p. 4).

Laughter is both a physiological and a social event. A purely social event includes "polite laughter," which has taken about the same amount of energy as speech. A purely physiological laugh is categorized as the "laughter of relief." The act of laughing is regulated and controlled by society (Coser, 1959 [cited in Mosak, 1987]), as extreme or bizarre laughter could be a sign of disease or dementia; whereas, the lack of laughter in the depressed may have been labeled as pathological.

LeShan (1982) said that laughter was for sharing. Laughter has relieved our existential aloneness (Lathrop, 1981, p. 9 [cited in Mosak, 1987]). The adaptive potential of laughter as a survival mechanism and as an alternative to hostility and aggression is great. Perhaps the subsidizing of a corps of comedians to spread around the world as an antidote to war and riots and in place of the CIA should be considered (Lathrop, 1981, p. 9)! Stylites (1950) suggested that progress in society could be measured by the stock of jokes it no longer found amusing. Mosak (1987) surmised that the sharing of laughter was generally a socially conjunctive
experience that bridged the gap between people and served an extremely valuable function in the maintenance of social cohesiveness (pp. 47-48).

**Types of humor** Raskin (1985) discussed the three broad categories of humor, including release-related, disparagement-related, and incongruity-related humor. Mosak (1987) described release-related humor as "unable to contain, giggling fits, bubbling over...bursts out, erupts" (p. 13). Norman Cousins (1979) described the release theory of humor while recuperating from a serious collagen disease. He claimed that a good ten minute belly guffaw could produce two hours of pain-free sleep. Cousins believed that if unhealthy emotions could lead to disease, then perhaps good emotions could lead to recovery. He quoted, "A merry heart doeth good like a medicine; but a broken spirit drieth the bones (Proverbs 17:22).

Disparagement-related humor is exemplified by Dreikurs (Dreikurs et al., 1951) when he suggested that laughter was caused by the unexpected nature of an event, e.g., "the surprise at the fall." Roberts and Johnson (1957 [cited in Dreikurs et al., 1951]) said that laughter was seen as relief at being spared the pain and embarrassment of having it happen to us! Rom (1971 [cited in Mosak, 1987]) said people laughed at an incident because they felt in a position of superiority over the victim and were indeed happy (p. 227). Mosak (1987, p. 227) said, "The perception of the comic is a tie of sympathy with other men--that could be us falling there or splitting our pants!" We confirmed for each other that we were human beings. When we laugh at others in this kind of predicament, we are basically laughing at our own humanness, as in the well-known and generally accepted phrase, "There, but for the grace of God, go I." We are
realizing our own humanness, our likeness to other people, our fellowship in the community of man, and our common vulnerability (Mosak, 1987, p. 20).

"Schadenfreude" humor emphasized malicious enjoyment of others' misfortunes. This "ego-deflating" variety of humor (Mettee & Wilkins, 1972) is found among those who feel a strong sense of inadequacy or have low self-esteem. Disparagement jokes allow us to express our aggression at those who place themselves above us; this illustrates a point that Adler (1964a [cited in Ansbacher & Ansbacher, 1964]) made—that jokes permit us to revolt against socially normal frames-of-reference. In both jokes and neuroses, we find the striving for significance with tendencies towards the depreciation of others (Ansbacher & Ansbacher, 1956). A client's example of this type of joke is the "can't win" type, e.g., a client complained about the analyst and said, "If I come early to my session, you say I'm overanxious; if I come late, you say I'm resisting; and if I come on time, I'm compulsive!" (Mosak, 1987, p. 22). The aggressive element in jokes is partly as a rebellion against the control which social agents may exercise over our lives. It may also be an effort to "humanize" others, to bring them down to our level of common humanity from the pedestal which some pretend to inhabit. "The more we must respect someone, the readier we are to laugh at him," said the French novelist Stendhal (1924 [cited in Ellenberger, 1970, p. 632 and Mosak, 1987]).

An example of laughing at oneself or self-disparagement humor is exemplified as follows. Much Jewish humor falls within this category and has been explained as a survival mechanism. Rabbi Ben Ezra (whom Robert
Browning memorialized in a poem, in a verse of his own, wrote, "If I sold lamps, the sun, in spite, would shine at night!" (cited in Mosak, 1987, p. 33).

Black humor dealt with the tragic. We felt we shouldn’t laugh at the joke, but "It is precisely the fact that we laugh that demonstrates our humanity" (Asimov, 1971, p. 6 [cited in Mosak, 1987]). Gallows humor was described by Freud as the cruelest form of humor, e.g.: A rogue who was being led out to execution on a Monday remarked, "Well, this week's beginning nicely!" (Mosak, 1987, p. 60).

Incongruity-related theories conclude that laughter comes about from the surprise of "the switch of the tracks" (Mosak, 1987, p. 25). Examples of incongruity-related theories include: incongruity, exaggeration, contradiction, understatement, a reversal, surprise, and something ludicrous and totally unreal. A requirement of well-developed mental processes was required to understand incongruities (Graham, 1958; McGhee, 1972a, 1972b [cited in Mosak, 1987]). An example of an incongruity-related joke is:

(From authority on etiquette): Should olives be eaten with the fingers? No, the fingers should be eaten separately! (Mosak, 1987, p. 25).

A ludicrous story is:

How do you get five elephants in a Volkswagen? Simple: Three in the front and two in the back!
An example of a surprise is:

What's that fly doing in my soup? Looks like the backstroke to me! (Mosak, 1987, p. 25).

**Humor in psychotherapy**  Morris Brody (1950) believed that a laugher, being unable to express his/her aggression directly, expresses it indirectly in the socially accepted manner of laughing. The depressed person, involved within himself, is unable to laugh because its meaning is too evident to him. "It is the most psychopathological and the healthiest people who can laugh easily. It has been said, 'The man that loves and laughs must sure do well'" (p. 210).

Weinstein & Goodman (1980) concluded that laughter is a natural state and that it facilitates connectedness, the feeling of belonging, and a cooperative spirit (p. 15). The generally accepted phrase, "Laugh and the world laughs with you," goes beyond just the physical aspect of laughing. LeShan (1982) believes that "Humor permits us to laugh at ourselves; it binds us together. It makes life's problems easier to endure...it heals" (p. 17). Humor is a clue that liking oneself is the beginning of being civilized to others.

"Humor is one technique used by the counselor/therapist, and it serves the purpose of bonding the relationship between the therapist and the patient/client. Deliberate use of humor in therapy can serve the function of emphasizing the humanness of the therapist and the client" (Mosak, 1987, p. 23). Adlerian therapy not only permits, but encourages the therapist to be "human" and to be a fellowman to the individual he is
trying to help. The client is not in a submissive position and the therapist is not the "expert" (Mosak & Phillips, 1980), but the two of them make a contract to work together in an atmosphere of mutual respect, as fellowmen (Mosak, 1984). This low level of tension facilitates such a cooperative, task-solving approach. Adlerians believe that learning occurs more readily in a relaxed atmosphere and that therapy is an educational and re-educational process (Mosak, 1987, p. 42). Narboe (1981) believed that therapy had indeed begun when humor appeared and that while life was indeed "nasty, brutish, and short, it was also funny" (p. 55). Dreikurs (Dreikurs et al., 1951, p. 20 [cited in Mosak, 1984, p. 43]) discussed an atmosphere of equality between himself and his clients when he heard his clients talking about him in a humorous way--"At any rate, it added yeast to the warm feeling my clients had toward me."

The farseeing psychologist, Dostoyevsky, surmised, "One can recognize a person's character much better by his laughter than by a boring psychological examination." This statement was endorsed by Adler (1927b [cited in Mosak, 1987]).

Studies have indicated that the lack of joking ability is an indicator of stress (Smith & White, 1965) and that humor disturbances are associated with disturbances in other emotional areas (Redlich et al., 1951). O'Connell (1975) cited, "In general, low humor response is related to repressive life styles" (p. 185).

In psychotherapeutic diagnoses, it is important to assess one's assets as well as one's difficulties, and humor is useful as a diagnostic tool. Humor has been shown to be positively correlated with intelligence,
insight, creativity (Smith & White, 1965), empathy, and reality contact (Roberts & Johnson, 1957), as well as general adjustment, maturity, internal locus of control, and lack of defensiveness (Lefcourt et al., 1974; O'Connell, 1960; Smith & White, 1965 [cited in Mosak, 1987, p. 49]).

Adler (1964b) used joking to let the client know that "he can take his trouble more lightly than he is doing" (p. 269). Clients have been known not only to "accept the importance of their own symptoms," but also to "play up the importance of their suffering and maintain their symptoms in order to avoid meeting the ordinary tasks of life." Humor helps clients take themselves and their problems less seriously when they need to do just that (Shulman & Mosak, 1967 [cited in Mosak, 1987]). "If a patient can first be induced to laugh, the grasping of an interpretation may become possible" (Rosen, 1963, p. 715 [cited in Mosak, 1987]). Jokes have been used to confront a patient with his/her hidden manipulations. An example of a joke used in this situation was that of the kindly and sympathetic man who was too gentle and tender-hearted to crop his dog's twelve-inch tail off, all at once; so he chopped it off one inch at a time (Mosak, 1987, p. 54!)

Both Adler (1964a) and Ellis (1977) encouraged the production of self-directed humor. When trying to change clients' irrational beliefs or their "life-style" patterns, the use of humor helps the client "get out of himself" and see the humorous side of some of his/her self-negative and self-defeating thoughts and behaviors. Warren Rule (1977) talked of the use of increasing self-modeled humor. Rule conducted a quasi-experiment which encouraged individuals to write down all of their self-defeating,
negative thoughts, during a two-week time span. The subjects were then required to record and listen to their self-defeating thoughts on a tape. After listening to the tape, the subjects were to try and reframe their thoughts, once again, in a humorous manner, and laugh at their negative thoughts. After a time span, the hypothesis that humor decreased the number of self-negative and irrational thoughts was positively supported.

Kuhlman (1984 [cited in Ansell et al., 1981]) believed that humor took the client off the track for a short time, and while on this sidetrack the client is given a slightly different view of his/her present situation. Mindess (cited in Ansell et al., 1981) saw humor as a facilitating insight but also as a helpmate for catharsis, self-acceptance, and openness in therapy.

Viktor Frankl (1969) suggested using paradoxical intention in a humorous way. He suggested telling a joke to depressed clients and letting them laugh—then telling them they can’t laugh! Why not? Because laughter is incompatible with depression (cited in Hassett & Schwartz, 1977, p. 103). Moody (1978) speculated that "for at least a moment, a person who laughs can forget his troubles. Perhaps humor sometimes works just by withdrawing attention from pain" (p. 112). Other humorous tactics in psychotherapy have included giving funny gifts, puppets, clowning, or humorous rational-emotive songs (Ellis, 1977, 1981).

Much therapy work is through the process of identification (Shoben, 1960). When the therapist shows an ability to laugh at himself, to accept his own weaknesses, and shows his own obvious enjoyment of life, the client has an example of a healthy sense of humor to model. Humor allows
man/womankind to detach themselves from themselves and thus to attain the fullest possible control over themselves (Mosak, 1987). Frankl (1969) said that humor allows man/womankind to create perspective and to put distance between himself and whatever may confront him.

Harold Greenwald (1975) spoke of the value of humor in psychotherapy by concluding:

"I think my humor comes out of a basic philosophic base that this world is an absurd place. One of the things that would be helpful for people to understand is the absurdity of it. The best example that I know of is Charles Chaplin. If you look at a Chaplin movie, you can dissolve in tears at its profound tragedy. But if you turn it just one degree the other way, it is a hilarious, comedy-farce. I like to help the people I work with to see the absurdity, the hilarity, the farce of life, and to enjoy it" (p. 116).

Grotjahn (1971) said that when the counselor and client do not laugh together, something has been missing in the therapy. Clients have shown the ability to survive errors if they wish to survive—and when they don’t survive them, they will leave therapy, whether or not errors (in humor, or in other techniques) are committed. In Adlerian therapy, errors of the therapist are not considered tragic, since the counselor is a fellow person—not God, or even "the expert" (Mosak, 1987, p. 76). If the client is comfortable enough to correct the therapist, it sometimes shows a partnership in the therapist/client relationship and also that the therapist has "the courage to be imperfect" and the "willingness to take risks"
(p. 76). Norman Cousins (1979, 1983) also stressed the doctor/patient relationship and its benefit to the client's sense of control over both his health and his progress.

Mosak (1987) emphasized that humor presents no more dangers than any other therapist's techniques and that any psychotherapy is risky for both the participant and the therapist--that both must take their risks if therapy is to succeed. Narboe (1981, p. 56) said, "Our usefulness as therapists lies in the range between what is expected and what is intolerable--too safe and there's no reason to move--too risky and there's no support for movement." Erv Polster (cited in Narboe, 1981, p. 56) used humor to demand contact. He trusted the client's ability to support himself. He trusted that messes could be recovered from.

The establishment of a positive sense of humor is considered a goal or a by-product of treatment and is one criterion of the success of therapy (Olson, 1976). Therapists confirm that a clear correlation often exists between increased mental health and the ability to laugh at oneself (Cassell, 1974; Fried, 1970; Grotjahn, 1966, 1971); in fact, emotional factors may interfere with our ability even to comprehend jokes (Levine & Abelson, 1959; Levine & Redlich, 1960; Smith & White, 1965). Mosak (1987) changes Grotjahn and Shakespeare's well-known statement, "He jests at scars, that never felt a wound," to read, "He jests most at scars who has recovered from his wounds" (p. 71). "Jokes grow best on the graves of old anxieties" (Grotjahn, 1972 [cited in Mosak, 1987, p. 69]).

Negative aspects of humor Humor, of course, may be malicious, just as any technique or form of communication may be. As the researcher
discusses the use of humor in both psychotherapy and wellness, it is assumed that the humor used is constructive and not used in an ill or unhealthy manner. Adler (1927b) reminded us that humor and laughter are both useful and useless, as any behavior could be. Laughter and cheerfulness have been used on the "useless" side to support an individual's defensive denial of reality or in aggressive support of his private fiction of superiority.

Kubie (1971) also supported a generally negative view of using humor in therapy. He still supported the "necessary incognito" behavior of the therapist, rather than the person-to-person "humanist" therapy. Kubie said that humor has a high potential destructiveness and that it is a dangerous weapon; and the mere fact that it amuses and entertains the therapist and gives him a pleasant feeling, is not evidence that it is a valuable experience for the patient or that it has exerted, on the patient, an influence toward healing change. Patients may become more relaxed when humor is used as a social lubricant, but other patients may have been sealed off and frightened into silence by the general impersonal atmosphere of joviality (p. 861). Humor is not always kind in casual social situations, let alone its use in therapy situations. A client may have wondered whether the therapist is serious about what he is saying or if he is "only joking"—what is serious and what is jest? The client may feel a need to "join in" with the humor, even though he is uncomfortable with it or does not really understand it. Of course, the individual situation of each client needs to be considered. Perhaps the client has had enough teasing and mockery in his past and thus, does not now need
more of the same in therapy. Kubie said a client may be assisted with the
therapist's "light touch of humor" in order to gain insight into his own
illness by being more objective. He encourages that humor should be used
only by the very experienced psychotherapist, and if used then, it should
not be used as a model for the younger, inexperienced junior therapist.
It was stated that a dour approach in therapy could also have its dangers.
Many clients have had enough "dourness" in life, also. Kubie concluded
with the fact that "Humor has its place in life" (p. 866) but that its
role has been very limited in psychotherapy.

Humor assessments literature review

The following paragraphs include a discussion of the varying humor assessment techniques used throughout history by several researchers. The majority of the studies include the use of subjects that are of college or adult age. The summary of these research studies is of value because the researcher in this study has compiled a humor assessment (the Natural Setting Humor [Natural SH] instrument, [Appendix C]) which includes many ideas from these previously tested humor instruments and assessments.

The "sense of humor" is an important personality trait. Hans Eysenck (1943) analyzed various tests in the "Appreciation of Humor." He dis­
cussed the following methods of determining a person's humor:

1. Comparing one's ranking of humorous items with that of a
standard group (Roback test, 1939).

2. Comparing the absolute judgments of funniness of various
humorous items with a standard derived from a large
group (Almack, 1928).
3. Requiring the subject to select the funniest ending for a joke, several endings being provided (Moss et al., 1926).

4. Presenting subjects with a cartoon and requiring them to produce a funny caption for it or to finish an unfinished joke (Claparede, 1934; Harrower, 1932).

The cognitive agreement (as in 1) or the affective score (as in 2) was assessed. Eysenck suggested that both the cognitive and affective scores be combined by asking the subjects how many items they find amusing or funny. His humor tests included jokes, pictures, limericks, verses, and comparisons. Three factors were found to be considered in explaining the amusement derived from a joke; these factors included comic (cognitive), wit (conative), and humor (affective).

Cattell and Luborsky (1947) also researched humor based on the fact that a man's personality may be revealed by observing the things at which he laughs most heartily. The following foundations regarding humor were considered:

1. Individuals are consistent in their preferences for certain kinds of humor.
2. Humor appears to be linked to repressions in the subjects, as Freud described.
3. There is a relationship between humor and projection tests.
4. "Humor tests" may be used to investigate deeper dynamic structure and degrees of emotional maturation of the subjects.

Many variables need to be considered when assessing a subject's humor, such as his or her differing social conventions, intelligence levels, sentiments, passing moods, the situation in which the joke is presented, familiarity with the joke, and the joke form (limerick, cartoon, etc.).

Redlich et al. (1951) believed that as emotional behavior, humor lends itself particularly to experimental and clinical investigation; it is the one form of emotion in our culture that can be expressed freely without restraint or anxiety (p. 718). Redlich (1951) devised a "Mirth Response Test" (MRT) to assess humor. This test includes cartoons because they are pictorial and probably more immediate and easily comprehended by the subject. Cartoons were selected from well-known magazines like the New Yorker, the Saturday Evening Post, Collier's, etc. The test is divided into three successive steps: 1) free expression (the observer records the subject's reactions to the cartoon by recording his laughter, expressions of disgust, etc.); 2) sorting (asking the subject to distinguish between those cartoons he likes, those to which he is indifferent, and those he dislikes); and 3) inquiry (the subject is encouraged to make any associative connections to the cartoon). The vocabulary of free expressions includes the belly laugh, horse laugh, hearty laugh, hysterical laugh, inhibited laugh, chuckle, snort, chortle, etc. A "smile" is a half-smile, stiff smile, artificial smile, sweet smile, empty smile, grin,
beam, etc. Negative responses are a sneer, snicker, titter, simper, giggle, cackle, roar, snarl, frown, etc. The Mirth Spectrum consists of the following items: 1) negative response, 2) no response, 3) half-smile, 4) smile, 5) chuckle, and 6) laugh. This test operates on Freud's theory that humor is a pleasurable release of inhibited wishes and that personality characteristics may be assessed by persons' appreciation of various forms of humor (p. 720).

Treadwell (1970) concluded that the study of humor is a useful approach to creativity research. Self-report measures of humor use and appreciation are devised for use by the subjects. To evaluate the subjects' humor, subjects are asked to rate themselves on a variety of humor preferences and to estimate the frequency with which they used humor in different situations.

Babad (1974) used a multi-method approach to the assessment of humor. Sociometric data were found to be the most valid, especially when humor was studied as a social, interactive phenomenon, and not as a cognitive phenomenon. Thus, Babad obtained the sociometric humor ratings from the subjects' peers and compared them to the subjects' self-report of their own humor. Subjects were divided into five groups according to the consensus of their peers: nonhumorous, appreciators, producers, reproducers, and producers-reproducers.

Fine (1975) conducted "perceived" sense of humor research in which subjects were asked to rate themselves and their same-sex best friend on sense of humor. In this research, the mean sense of humor rating was quite high for both self and best friend. A short "Sense of Humor
Questionnaire" of ten questions was filled out by the subjects, and they were asked to rate their own sense of humor and their best friend's sense of humor from poor (1) to excellent (9), their ability to make humorous remarks, and their frequency of humorous remarks from infrequent (1) to very frequent (9) (p. 793).

Alan Feingold (1983) measured humor ability by revising Fine's humor perceptiveness test (Fine, 1975). The test items are in the form of joke completions, e.g., "Take my wife _______!" (Feingold, 1983, p. 163) and include relatively common jokes that American urban college students have had an opportunity to encounter. The examples are classic one-liners by Henny Youngman and Groucho Marx. It is important to remember that a test of humor comprehension should require more than the recall of jokes. When hearing a joke for the first time, humorous people can often "figure out" the punchline before the end of the joke is reached.

Townsend, Mahoney, and Allen (1983) discussed the relationship between humor and stress in test situations. College students were asked to complete a regular class test of 35 multiple-choice items interspersed with five humorous items--either verbal items written in multiple-choice format or selected cartoons from a nationally syndicated comic strip (Charles Shultz's comic strip of "Peanuts" (1968).

Paul Dixon (Dixon et al., 1987) simply measured the humor of his research subjects by asking them to rate their sense of humor on a scale of from 1 to 10, from "least" to "most." Robinson and Shaver (1973) said that such one-item scales as the sense of humor have been shown to have high test-retest reliability and strong correlations with behavioral
measures. Dixon's subjects were found to have a positive relationship between their self-ratings of happiness and humor. The high social interest subjects (as rated on the Social Interest Index [Greever et al., 1973]) rated themselves as having greater humor than the low social interest subjects.

Jerry Greenwald suggested to the researcher, "You want to assess humor? Ask them, 'Are you humorous? Tell me your favorite story!'" When speaking of written humor assessments, he also said, "A humor assessment? That doesn't sound very humorous!" (Greenwald, 1991).

Lefcourt & Martin (1986) devised and tested the two humor assessments, the Situational Humor Response Questionnaire (1986) (Appendix E) and the Coping Humor Scale (1986) (Appendix F). These authors published the book, "Humor and Life Stress: Antidote to Adversity." The entire book discussed the varying ways in which these two humor assessments were tested for reliability and validity and it is reviewed in the methodology section of this study. These authors also discussed and tested Svebak's Humor Questionnaire (1974a) (Appendix D), which was an assessment designed to assess generalized individual differences in humor production and appreciation, rather than preferences for particular types of humor.

William Fry and Waleed Salameh (1987) discussed the physiological as well as the psychological benefits of humor. Fry first coined the phrase that laughter is "internal jogging" (p. 74).
Fitness History (FHx)

Fitness in the wellness area has included the study of persons' past and present Fitness History (FHx). The FHx research areas frequently mentioned and examined in this literature review were: physical wellness, exercise, mental wellness, stress level, humor and laughter status, cigarette smoking, and lifestyle situations, such as having children or marital status.

In the 1990s, one finds it almost impossible to go through an entire day without being exposed to media that have involved physical wellness. The concept of the attractive, healthy, and physically fit person is an "in" item in the 1990s. This apparent national preoccupation with fitness has affected many segments of our society. People of all ages and backgrounds have decided to take responsibility for their own physical and mental wellness and fitness by becoming physically active (Prentice, 1991). The positive benefits of exercise in both health and disease states have been listed by Pollock et al. (1984), who discuss the use of exercise for improving cardiorespiratory disease, obesity and weight control, cardiovascular disease, and the musculoskeletal function.

Yet, with all of this mass-media advertisement of wellness and fitness, there has been a need to define "fit" persons as those who are fit in totality, and not just in physical wellness. In fact, this emphasis in the 1980s and 1990s is quite a change from even the early 1980s. Pollock et al. (1984) write about the advancement of America's highly technological society and how Americans no longer work physically hard to survive. Their lives of ease and comfort are creating a nation at risk
for cardiorespiratory and cardiovascular disease. Pollack et al. (1984), Travis and Ryan (1988), and Ardell (1986) discuss the need for people to deal with their "total being" and to alter their "total lifestyle" to achieve good health habits.

The area of mental health and stress reduction in wellness is another area of Fitness History. Hans Selye (1978 [cited in Anspaugh et al., 1991]) defined the term stress as the "nonspecific response of the body to any demands made upon it" (p. 43). The view that stress can be either viewed as eustress or distress shows us that stress can be viewed as either good or bad. Healthy eustress occurs when stress is viewed as positive, and it serves to initiate emotional and psychological growth. Unhealthy distress is stress that results in negative responses. Unchecked, negative psychological functioning of the body (distress) may ultimately result in disease or disability (Anspaugh et al., 1991).

Stress has also been viewed as the Type A coronary-prone behavior pattern and has been characterized by extreme competitiveness, striving for achievement, and a chronic sense of time urgency. Type A behavior has been linked with coronary heart and health problems (Steptoe & Mathews, 1984).

Another inclusive summary of mental wellness is the hardiness scale. Kobasa (1979, p. 51 [cited in Bigbee, 1985]) first identified the concept of hardiness. He defined it as "constellation of personality characteristics that function as a resistance resource in the encounter with stressful life events." The three components of hardiness include commitment, challenge, and control, each of which helps people feel as though their
stress and life-changing events are challenges. These challenges provide
the potential for growth and greater authenticity, rather than providing
negative, victimizing experiences over which they have no control. Other
fitness areas included smoking, humor, and lifestyle situations. Tobacco
use has been determined to be harmful to your health (Surgeon General,
Dept. of Health, Camel filters cigarette package). Both Anspaugh et al.
(1991) and Prentice (1991) discuss the health-damaging aspects of tobacco
use: for example, cancer, emphysema, coronary heart disease, peptic
ulcers, and complications in pregnancy. Tobacco use assessment was
discussed by Prentice (1991) with his assessment entitled "Test Your
Knowledge about Cigarette Smoking" (pp. 49-50) and Anspaugh et al. (1991),
with their "Risks of Smoking" table (p. 220) and "Smoking Cessation"
information (p. 221). Humor and laughter have been included in the FHx,
as they affect people's mental and psychological health. Fry and Salameh
(1987) spoke of laughter as "internal jogging" because it increased
persons' blood circulation, heart rate, and endorphin rush. The many
benefits of humor are cited by numerous authors, as seen in the previous
humor literature review. Lifestyle situations, such as marriage and
having children at home, are included in the concept of FHx. These
lifestyle situations include demographic and everyday situations that do,
in fact, affect persons' wellness and FHx. Lifestyle situations are
discussed in both Prentice (1991) and Anspaugh et al. (1991). Don Ardell
(1977) also has discussed the norms and culture lifestyle of persons when
evaluating their wellness. Travis and Ryan (1988) have discussed life-
style situations in each of their 12 wellness areas.
Physical wellness and exercise, other elements in Fitness History, have been assessed in many ways. Pollock et al. (1984) summarized the physical and exercise wellness assessments as follows: medical screening and evaluation procedures, prescribing exercise for the apparently healthy, prescribing exercise for the rehabilitation of the cardiac patient, and nutrition in health and disease (Golding et al., 1982; Kannel et al., 1976).

Mental wellness and stress level assessments, other Fitness History elements, have been discussed by Ardell (1977), Travis and Ryan (1988), and Selye (1978 [cited in Prentice, 1991]). Ardell discussed stress management as well as his stress indices, and Travis and Ryan discussed mental wellness in the "feeling, thinking, communicating, and transcending" areas of their wellness wheel. Selye (1978, p. 247 [cited in Prentice, 1991]) explains the GAS (General Adaptation Syndrome) and the body's response to stress, and Prentice assessed stress with his Personal Stress Inventory and the Hurry Sickness Index (Steptoe & Mathews, 1984).

Humor and laughter have been assessed in many areas, and these various assessments are listed in the previous humor assessment literature review. Other researchers to note were Eysenck (1943), who assessed humor as the "Appreciation of Humor," Redlich et al. (1951) and their "Mirth Response Test," Cattell and Luborsky (1947) and their assessment of laughter, Treadwell (1970) with his self-report measures of humor and humor frequency, and Babad (1974) and his multi-method sociometric evaluation of humor.
Cardiorespiratory after pulse (CAP)

The physiological area of wellness is exemplified by the concept of cardiorespiratory after pulse (CAP). CAP is one method of evaluating cardiorespiratory endurance. David Anspaugh et al. (1991) listed several health-related components of physiological wellness, and cardiorespiratory endurance was one of them. These health-related components were cardiorespiratory endurance, muscular strength, muscular endurance, flexibility, and body composition. Anspaugh et al. (1991) define cardiorespiratory endurance as "the ability to take in, deliver, and extract oxygen for physical work." It is the ability to persevere at a physical task, and it improved with regular participation in aerobic activities such as walking, jogging, cycling, swimming, and cross-country skiing. The term "aerobic" literally means "with oxygen," but when applied to exercise, it refers to activities whose oxygen demand can be supplied continuously, by individuals, during physical performance. Anspaugh et al. (1991, p. 141) also said that "from a health perspective, cardiorespiratory endurance is the most important component of physical wellness, and it is the foundation for the development of total fitness."

CAP assessment literature review

Cardiorespiratory functioning is dependent upon efficient respiratory and cardiorespiratory systems that help the body utilize oxygen during exercise (Astrand & Rodahl, 1970; Wilmore, 1982; McArdle et al., 1981). The heart is the key to the oxygen transport system that improves with endurance training (Pollock et al., 1984, p. 53). Because VO₂ (maximum oxygen uptake), or aerobic capacity, summarizes what is going on during maximum or exhaustive exercise and can
be measured rather easily, it is used as the measure most representative of cardiorespiratory fitness (Pollock et al., 1984). Thus, one method of evaluating physiological wellness is by testing persons' cardiorespiratory endurance. CAP was the method and measurement used in this study to evaluate persons' cardiorespiratory endurance. Bench step tests (Katch & McArdle, 1983; Baumgartner & Jackson, 1982; Golding et al., 1982; Kasch & Boyer, 1968) were designed to determine aerobic working capacity by measuring the time required for the heart rate to reach a specified level while performing a standardized workload. This measurement of heart rate from the bench step test is called cardiorespiratory after pulse (CAP). It is noted that consistent participation in exercise is necessary to improve cardiorespiratory health status. The effects of physical training persisted as long as the exercise continued, as sporadic exercise did not promote physical fitness as effectively as regular exercise.

The effects of physical training on cardiorespiratory endurance are both measurable and predictable. Important components of the oxygen transport system improved with endurance training (Pollock et al., 1984, p. 53). Maximum oxygen uptake ($V_{O_2} \text{max}$), or aerobic capacity, is the largest amount of oxygen that one can utilize under the most strenuous exercise (Astrand & Rodahl, 1970; Wilmore, 1982; Pollock et al., 1984). $V_{O_2} \text{max}$ correlates highly with cardiac output. Maximum oxygen uptake generally summarizes what is going on during maximum or exhaustive exercise and is measured rather easily. It is used as the measure most representative of cardiorespiratory wellness (Astrand & Rodahl, 1970;
The 3-minute bench step test is a recommended, accepted, valid, and reliable method of measurement of cardiorespiratory fitness (Anspaugh et al., 1991; Prentice, 1991; Baumgartner & Jackson, 1975; Golding et al., 1982). Exercise physiologists (Astrand & Rodahl, 1970) report that recovery heart rate gives only a rough idea of the heart rate attained during work. The reported correlation between recovery heart rate and steady state during aerobic work was .77. By contrast, correlations as high as r=.96 were found between the heart rate during 1 to 1½ minutes of exercise and the steady state achieved during aerobic work.

The prediction of VO$_2$ max is also determined by a submaximal bench stepping test (Baumgartner & Jackson, 1975; Kurucz et al., 1969; Katch & McArdle, 1983). The basic assumption of this test is similar to that of the submaximal cycle test. Given an equal amount of work to accomplish (stepping up and down on a bench at the same rate and total time), the participant with a lower heart rate is in better physical condition and therefore has a higher VO$_2$ max.

Step tests are not only reliable for evaluating aerobic working capacity, but are also useful for teaching important concepts about physical fitness. In order to improve test scores, students must have 1) lowered the heart rate for the specified workload, 2) lowered the body weight if overweight, or 3) shown a combination of both. This observation is verified by examining the regression equation reported by Golding et al. (1982). A higher estimated oxygen uptake is achieved by increasing
work and lowering body weight. These were basic objectives of physical fitness programs (pp. 195-204). A submaximal bench step test for healthy, middle-aged adults was developed by Kasch and Boyer (1968 [cited by Golding et al., 1982; Kannel et al., 1976]). Norms for adult men and women on the Kasch Bench Step Test are available in "The Y's Way to Physical Fitness" (Golding et al., 1982 [cited by Pollock et al., 1978, p. 181]) (Appendices I and J).

**Happiness**

Happiness research, with a focus on the various ways individuals experience their lives, has been traced back to the early part of this century (Veenhoven, 1984a). As interest steadily grew, social scientists began obtaining life satisfaction and subjective happiness data during the 1950s. By the 1960s, these data, from national and cross-national polls, were considered to be influential in national policy decisions as well as in presenting promising indications about the nature of human behavior on the psychological frontier.

In Fellows' (1966) review, the concept of happiness was examined in regard to the psychological and sociological perspectives of the day; this perspective included goal setting, performance, motivation, the release of tension, and energy. The happiness concept was felt to be equated with positive mental health and psychological well-being (Bradburn & Caplovitz, 1965). Correlates found to be positively identified with happiness were evident from survey data: these included the correlates of enjoyment, interest, and success in one's occupation or related meaningful activity,
and good health (Flügel, 1925; Usager, 1948). Social relationships, which included support from friends and family, were also apparent (Usager, 1948; Lawton, 1943; Watson, 1930).

Wilson (1967) postulated that happiness was defined by the prompt satisfaction of three types of need: physiological, pleasure-seeking, and acquired. A second postulate was that an individual's happiness and degree of fulfillment were dependent upon variations in adaptive levels, past experiences, comparisons with others, values, and other factors. Correlates positively associated with happiness included happy childhood memories, youth, successful social relationships, reduced worrying, maintaining health, pursuing sports, and outside activities (Bradburn & Caplovitz, 1963; Fellows, 1966; Washburne, 1941).

Bradburn, Andrews, and Withey categorized the study of happiness in two general approaches. The first approach was based on an individual's affective processes or moods. Bradburn (1969) weighed the amounts of pleasant affect against the amounts of unpleasant affect experiences. The second method was based on an individual's notions of the needs and aspirations being sought (Andrews & Withey, 1974). This approach involved asking individuals to indicate their subjective impressions of happiness by needs and aspirations.

The three happiness theories most pertinent to this study and to the happiness index used in this study were the Multiple Discrepancies Theory (MDT) developed by Michalos (1986), a two-component theory of happiness developed by Veenhoven (1984a), and Fordyce's cognitive approach to happiness (Fordyce, 1977 [cited in Taylor, 1988]).
In the Multiple Discrepancies Theory, Michalos (1986) defined happiness as feelings and attitudes that were relatively long lasting and justified. Basically, Michalos postulated that net life satisfaction was the result of discrepancies between what one has and what one wants out of life. The discrepancies were concerned with what one currently wanted, needed, and expected compared to what one wanted, needed, and expected in the future. Michalos applied this theory to the aged, to university clerical workers, and to rural community members. He suggested that this progressive vision included the elements needed to assist others in moving away from an unsatisfactory state of life to a more satisfactory one.

Veenhoven (1984a, p. 17) defined happiness as "the overall appreciation of one's life as a whole." His volumes included an analysis of some 245 empirical studies of happiness, and he spoke of the "hedonistic affect" and contentment associated with happiness.

Based on the assumptions that happiness can be taught, and that increased knowledge and self-growth can occur, Fordyce (1977) attempted to answer two questions: 1) Could individuals modify their lifestyles to be more like happy persons? and 2) Could these changes be permanent? Fordyce developed two self-report measures in conjunction with an education program, the Happiness Measures and the Psychap Inventory (Fordyce, 1977, 1985).

Humor, Fitness History, CAP, and happiness interrelatedness

The area of wellness and the wellness concepts of humor, FHx, CAP, and happiness have previously been discussed as separate concepts. In the
following paragraphs, the interrelatedness of these concepts will be discussed.

The total area of wellness began with the physical wellness and physical fitness concept. Providing a weight-lifting room or gym in a place of business was how the area of physical wellness first began. To measure one's physical wellness, various sources of measurement are used. The measurement of CAP is one method of measuring physiological wellness.

Wellness experts encourage clients to "take themselves lightly" and to "use gentle compassion" (Travis & Ryan, 1988) with themselves and with others. These two phrases link humor and happiness with the wellness philosophy. The concept of humor is frequently referred to in many wellness programs and wellness reading sources. Ardell (1986, p. 54) emphasized the importance of enjoying what you do to manage stress and of "getting lost" in a calming activity. He also emphasized the fact that "exercise is fun, so don't cheat yourself by taking an activity too seriously," and to "find your own pleasures." He stated that:

High-level-wellness is more rewarding than low-level-worseness because the high-level well person is simply more fun, stronger, better looking, exhibited a higher morale, has better circulation, superior bowel movements, and more antibodies to resist illness. Such a person is warmer in winter, cooler in summer, and sleeps better all year round! (p. 54).

Ardell's wellness books (1977, 1986) were interspersed with humorous sayings, quotes, and jokes. There was a pervading atmosphere of frequent-
ly encouraging and allowing the readers to be gentle and compassionate with themselves during this wellness endeavor.

Humor and happiness were shown in the areas that appear to pervade each of the 12 wellness areas (Travis & Ryan, 1988) in this study. Correlates found to be positively identified with happiness were evident from survey data, and they included good health (Iisager, 1948; Lawton, 1943). Health is thought to be highly associated with happiness (Edwards & Klemmack, 1973; Larson, 1978; Markides & Martin, 1979; Near, Rice, & Hunt, 1980; Ray, 1979; Riddick, 1980; Spreitzer & Snyder, 1974; Toseland & Rasch, 1979-80; Zeglen, 1977). One speculation is that with good health, options to increase one's life satisfaction, in many ways, are also provided (Taylor, 1988, p. 14). In Gillespie's (1942) wartime study, the sample group of working-class adults identified many factors related to their happiness; one was humor, and others were security, knowledge, action, and beauty. Maintaining health, pursuing sports, and outside activities (Bradburn & Caplovitz, 1965; Fellows, 1966; Washburne, 1941; Watson, 1930) were summarized as correlating positively and associating with happiness in Wilson's Happiness Critique (cited in Wilson, 1967).

Summary of Literature Review

The wellness entity is made up of many concepts. When these concepts are found working together in a harmonious and holistic manner, they exemplify "well" persons. The researcher reviewed many wellness concepts in the literature review. The wellness concepts discussed in this review were those of humor, FHx, CAP, and happiness. The art of using "gentle
compassion" and "taking yourself lightly," as John Travis and Regina Sara Ryan suggested (1988), is used throughout the wellness theme of this dissertation. Humor is one way to assess social wellness, and it has been defined, divided into various types, explained in the psychotherapeutic sense, and reviewed for its negative aspects. In the FHx, the concept of fitness and wellness was discussed in its multi-categorical sense, including physical wellness and exercise, mental wellness and stress reduction, humor and laughter, smoking, and lifestyle situations.

The CAP concept was the physiological wellness area discussed in this study. The measurement of CAP was summarized and explained. The emotional wellness area of happiness was reviewed by explaining various happiness ideas. Many indicators consistently reappeared in the happiness assessment review; these included employment, good health, social relationships, and the personal qualities of self-esteem, contentment, the ability to love and give to others, and commitment toward goals.
CHAPTER III. METHODOLOGY

The purpose of this study is to examine the wellness concepts of humor, Fitness History (FHx), cardiorespiratory after pulse (CAP), and happiness. This process involved the following steps: 1) hypothesizing a priori sources of humor, FHx, CAP, and happiness, 2) developing a humor instrument, 3) conducting a pilot study of the humor instrument, 4) revising and redeveloping the humor instrument, 5) developing a FHx instrument and assessing the subjects' fitness, 6) assessing the subjects' humor by using the Natural SH and three additional humor instruments, 7) assessing the subjects' happiness by using a happiness index, 8) assessing the subjects' CAP by evaluating their performance on a bench step physical assessment, and finally, 9) implementing the actual study data collection and data analysis.

Because of the many aspects that are included in a wellness philosophy, the researcher chose to research and discuss four of the many wellness areas for this study. Thus, this research has been limited to the discussion of the area of social wellness as exemplified by the concept of humor; the fitness area as exemplified by the concept of Fitness History; the physiological area of wellness as exemplified by the concept of CAP; and the emotional wellness area as exemplified by the concept of happiness.

The subjects in this study are first identified and discussed, after which the instrumentation utilized will be discussed. The instrumentation section includes the development of the new humor instrument (Natural SH),
its modification, and all of the additional instruments used for the assessment of humor, FHx, CAP, and happiness. The entire data collection for all concepts is then explained, and the data analysis procedures are provided at the conclusion of this chapter.

Subjects

The subjects in this study were all Iowa State University (ISU) employees or students who had enrolled in the ISU exercise clinic classes for the semester during this research (Spring, 1991). The classes were physical fitness classes taught by the physical education/exercise physiology instructors.

The research was conducted during the exercise clinic’s regularly scheduled class periods. The exercise groups were chosen as a source for subjects because the participators have shown an expressed interest in exercise by attending the exercise class. The classes were one-hour sessions at two or three times per week.

The 98 subjects were participants in six exercise groups meeting at different times of the day, with different instructors and different types of exercise offered. The morning (6-7 a.m.) exercise group of 15 subjects participated in approximately 50 minutes of running, walking, or cycling (participants’ choice). The second morning (6-7 a.m.) exercise group of 17 subjects participated in approximately 50 minutes of water aerobics. The noon (12-1 p.m.) exercise group of 23 subjects participated in approximately 50 minutes of step aerobics (stepping up and down on a bench).
The second noon (12-1 p.m.) exercise group of 14 subjects participated in approximately 50 minutes of running, walking, or cycling. The evening (5-6 p.m.) exercise group of 24 subjects participated in approximately 50 minutes of running, walking, or cycling. The second evening (5-6 p.m.) exercise group of five subjects participated in approximately 50 minutes of aerobic exercise.

The total number of exercise subjects was 98, and there were 34 men and 64 women. One subject was only available for the first humor assessment. In the pilot study, there were 15 subjects consisting of 11 females and four males.

Instrumentation

There were four humor instruments, one FHx instrument, one CAP instrument, and one happiness instrument used in this study. The four humor instruments included the Natural Setting Humor (Natural SH) instrument (Bartels, 1991), Svebak's Humor Questionnaire (Svebak's HQ) (Svebak, 1974a), the Situational Response Humor Questionnaire (Situational RHQ) (Lefcourt & Martin, 1986), and the Coping Humor Scale (Coping HS) (Lefcourt & Martin, 1986). The FHx instrument included the Fitness History (FHx) (Bartels, 1991). The cardiorespiratory after pulse (CAP) instrument was the Kasch Bench Step Test (Kasch & Boyer, 1968), and the happiness instrument was the Actual and Ideal Happiness Scale (AIHS) (Taylor, 1988).
Humor instrumentation

Humor is used as the concept that best exemplifies the area of social wellness in this study. In order to have the subjects' humor evaluated in its totality, four humor instruments were used. The researcher designed a humor assessment; this first humor instrument was compiled of many other researchers' methods and techniques of evaluating humor. The first humor instrument was called the Natural Setting Humor (Natural SH) instrument. The researcher used three other humor instruments: the Svebak's HQ (Svebak, 1974a), the Situational RHQ (Lefcourt & Martin, 1986), and the Coping HS (Lefcourt & Martin, 1986). This "test-battery" approach was utilized, as it appeared to provide a more reliable, valid, and comprehensive method of assessing humor. The validity of the four humor instruments is provided in the following discussion.

In Lefcourt and Martin's (1986) validational research, they correlated subjects' scores on the three humor scales (Svebak's HQ, Situational RHQ, and Coping HS) with a number of criteria, including the behavioral observations of their laughter and smiles during an interview, the rated funniness of their attempts to create humorous monologues, and the rating of their sense of humor as obtained from their friends. Five studies were discussed and thus provided varying degrees of support for the validity of each of the three humor scales as assessments of the sense of humor of university students. These data indicated that the instruments are generally valid as assessments of humor. The validational criteria that were significantly correlated with one or more of the humor scales included: 1) the frequency and duration of subjects' laughter during an
interview, 2) peers' ratings of subjects' sense of humor and their tendency not to take themselves too seriously, 3) a measure of positive moods, 4) a measure of self-esteem, 5) ratings of mirth following experiences of failure, 6) the number of witty remarks and rated humorousness of an impromptu comedy routine, 7) the rated humorousness of a narrative produced while watching a stressful film, and 8) the number of witty comments produced spontaneously in response to a test of creativity.

A simple frequency count of significant correlations suggested a greater validity for the Situational HRQ than for the other scales. This may have been due in part to the greater length, and therefore higher reliability, of this instrument. Lefcourt and Martin (1986, p. 47) suggested the various humor indices be used in a sort of test-battery approach, providing profiles of scores for individual subjects.

Natural Setting Humor (Natural SH) instrument The Natural Setting Humor (Natural SH) instrument was compiled by the researcher and combined ten aspects of the humor assessments used by previous researchers (Appendix C). The subjects' sense of humor was assessed in the natural setting of the exercise clinic. (Conducting humor evaluations of subjects in their own natural setting was suggested by Brown et al. [1982].)

The Natural SH was composed of five areas which included the following: 1) rating cartoons according to their degree of humor in section 1; 2) rating jokes according to their degree of humor (section 2); 3) completing one-line jokes (section 3); 4) filling in captions to cartoons (section 4); and 5) responding verbally and in writing to questions about the subjects' humor (questions 5-9). These varying methods of evaluating
humor allowed the cognitive and affective aspects of an individual subject's humor to be compared with the entire group's humor. The five areas of evaluating humor found in the Natural SH were used by other prior researchers. These prior researchers, and their methods of evaluating humor, are discussed in the following paragraphs.

The first two areas of evaluating humor in the Natural SH were:
1) rating cartoons according to their degree of humor and 2) rating jokes according to their degree of humor. Several humor researchers used these two methods. Hans Eysenck (1943), Roback (1939), and Almack (1928) discussed the use of evaluating one's humor by the rating of humorous items and comparing the funniness of humorous items (sections 1 and 2 of the Natural SH). Redlich et al. (1951) asked his subjects to tell which cartoons they liked and disliked (section 1).

The third and fourth methods of evaluating humor involved:
3) filling in the answers to jokes and 4) filling in the captions to cartoons. Feingold (1983) evaluated humor by using joke completions. He used the classic one-liners by Henny Youngman and Groucho Marx (as seen in section 3 in the Natural SH). Townsend et al. (1983) used "Peanuts" cartoons by Charles Schultz to help subjects express their humor (section 4). Eysenck (1943) and Moss et al. (1926) also talked of requiring the subjects to select the funniest ending for a joke (section 3). Eysenck (1943), Claparede (1934), and Harrower (1932) presented cartoons and required the subjects to produce a funny caption for them (section 4). Eysenck's (1943) humor assessments included several varying uses of jokes, pictures, limericks, verses, and comparisons (sections 1-4).
Redlich et al. (1951) used cartoons (section 4) when assessing humor because they were usually more easily comprehended by the subject.

The fifth area of humor evaluation in the Natural SH subjects' was verbal and written responses to questions about their own humor. The question in section 5 asked the subjects to a) estimate the number of times they had laughed during this Natural SH assessment session (question 5); b) rate their own sense of humor (question 6); c) tell the researcher their favorite humorous story (question 7); and d) ask colleagues to rate subjects' humor (questions 8 and 9).

The researcher, on the basis of the individual assessment session, evaluated the subjects' humor, with the following methods: 1) rated the subjects' sense of humor (from 1-5); 2) rated the subjects' humorous story (from 1 to 3); 3) recorded the frequency and type of the subjects' laughter; and 4) rated the subjects' type of humor (active, passive, producer, reproducer of humor). Support for questions 5-9 and subsequent evaluation comes from Treadwell (1970), Dixon et al. (1987), Eysenck (1943), and Greenwald (1975).

Dixon et al. (1987) asked subjects simply to evaluate their own sense of humor (question 6) by rating themselves on a scale from 1 to 10. Harold Greenwald (1975) suggested asking the subjects, "Are you humorous?" (question 6) and "Tell me your favorite story!" (question 7). Babad (1974) found sociometric humor assessment to be the most valid, including both the subjects' and their peers' evaluation of their humor (questions 6, 8, and 9). Fine (1975) asked subjects to perceive their own sense of humor by rating themselves (question 6) and the sense of humor of their
best friend or colleague (questions 8 and 9). Redlich et al. (1951) evaluated the subjects' reactions to cartoons by recording their laughter, including their snorts, chuckles, smiles, sneers, titter, giggles, and frowns (as observed by researcher). Babad (1974) also categorized the subjects into passive or active humorists, and into humor producers or humor reproducers (as observed by the researcher).

The Natural SH was evaluated for length, amount of time needed to complete, and for any confusing or unclear items by first conducting a pilot study. In the pilot study, the Natural SH instrument was administered to 15 graduate students in a counseling class. Participants in the pilot study were given the same beginning instructions used later in the main study, and were also asked for any comments concerning ambiguous or confusing items on the instrument. Three people refused to fill in the cartoons, saying, "I have a hard time with this sort of thing," or "This is not for me." One subject wrote that she did not get joke #4 in section 2 of the instrument. One subject suggested that the scale for rating the cartoons and subjects involve more than three points (not humorous, moderately humorous, or very humorous). The subjects needed about 20 minutes rather than the 15 minutes the researcher told them the assessment would take. In conclusion, there was no substantial confusion concerning the test. The researcher noted some hesitancy about filling in the cartoons, yet felt that was an important element in assessing humor—to see if the subjects would actually take the time to try and be humorous, and show such by filling in the cartoons. A longer Likert rating scale
for the cartoons and jokes was considered, but rejected for the sake of brevity and consistency.

**Svebak's Sense of Humor Questionnaire**

The Svebak's SHQ (Svebak, 1974a) (Appendix D) was designed to assess generalized individual differences in humor production and appreciation, rather than preferences for particular types of humor. Svebak's SHQ consists of three essential elements: 1) metamessage sensitivity (MS), or the ability to recognize humor in situations; 2) personal liking of humor (PL), or the enjoyment of humor and the humorous role; and 3) emotional expressiveness (EE), or the tendency to express one's emotions freely. A sample item of the MS is, "I can usually find something comical, witty, or humorous in most situations" (question 4 of Svebak's SHQ). Typical of the items in the PL subscale is, "It is my impression that those who try to be funny really do it to hide their lack of self-confidence" (question 13). An item from the EE is, "I appreciate people who tolerate all kinds of emotional expression." The EE questions were not used in this study, as explained in the following paragraphs.

Svebak (1974a, 1974b) did not report any reliability or validity data for his scale. Lefcourt and Martin (1986) examined the psychometric properties of the Svebak HQ. The internal consistency coefficients (Cronbach alphas) for the MS, PL, and EE subscales, respectively, were .59, .65, and .00. The total scale had an internal consistency of .63. Stability coefficients over a one-month period for the three subscales and total scale were .78, .58, .58, and .69, respectively. These findings have generally been replicated in several other studies in which this
instrument has been used: reliabilities in the .60 to .75 range for the first two subscales and usually below .20 for the third subscale. Thus, the EE subscale was clearly not reliable enough, whereas the first two subscales, although their reliabilities were fairly low, showed some promise. The researcher did not use the EE items in this study, as they did not show high reliability or validity when Lefcourt and Martin (1986) tested them. Over the course of numerous studies, Lefcourt and Martin accumulated a considerable body of largely favorable validity data for the MS and PL subscales.

The Situational Humor Response Questionnaire (Lefcourt & Martin, 1986) (Appendix E) emphasized the behavioral approach rather than focusing on actual expressions of mirth, such as smiles and laughter. This humor instrument indicated that humor can be defined in the quantitative rather than the conformist sense, if a wide variety of situations are sampled. This approach indicated how often people smile and laugh in situations that they encounter in their daily lives, not just how much they agree with others in appreciation of specific jokes and cartoons. Both pleasant and unpleasant situations and specific-to-general situations were included in the questions in the Situational HRQ.

The 21-item Situational HRQ was administered to well over one-thousand male and female undergraduate students at the university level, and the Cronbach alphas were found to range between .70 and .85. Analyses of individual items revealed average corrected item-total correlations ranging from .25 to .55. Test-retest reliability coefficients were obtained over a one-month period in the .70 range. No differences in
reliability were obtained between males and females. Considering the heterogeneity of the situations described in the scale items, they considered these levels of internal consistency and stability to be acceptable. Of special interest was the self-rating question, item 20 ("How would you rate yourself in terms of your likelihood of being amused and of laughing in a wide variety of situations?"). Six percent of subjects rated their sense of humor below average and 94% rated theirs as average or above. Because the responses on this question were highly correlated with the total score, however, they retained it in the test (Lefcourt & Martin, 1986, pp. 22-27).

The Coping Humor Scale In view of the interest in humor as a moderator of stress, Lefcourt and Martin (1986) created an additional humor assessment that was designed specifically to assess the degree to which individuals make use of humor in coping with the stressful events that they encounter in their lives. The previously cited Situational HRQ was designed to assess individuals' overall sense of humor, regardless of its role in coping with stress. This short seven-item scale, called the "Coping Humor Scale" (Coping HS) (Appendix F) contained such items as, "I have often found that problems have been greatly reduced when I tried to find something funny in them," and "I can usually find something to laugh or joke about even in trying situations." Subjects rated the degree to which they agree or disagree with each item on a four-point scale, and a total score was computed by summing across the items. Internal consistency analyses for this instrument have generally produced Cronbach alphas in the .60 and .70 range (Lefcourt & Martin, 1986).
Fitness History instrumentation (FHx)

Fitness History (FHx) was the concept that best exemplified the fitness area of wellness in this study. The reason for including a fitness instrument in this study was to assess the subjects' fitness longevity. A time span of three years was arbitrarily utilized to compare the subjects' present fitness with their fitness at an earlier date.

A brief FHx questionnaire was constructed and given to the subjects. This one-page questionnaire, entitled Fitness History (FHx) (Appendix G), included 13 questions pertaining to the subjects' physical wellness, exercise, mental wellness, stress level, humor, laughter, reads comics, cigarette smoking, gender, and lifestyle situations of having children and marital status. The questions were selected to briefly portray the subjects' fitness status in several of the common and well-known areas of wellness.

The physical wellness question in the FHx included: "I am more physically well now than I was three years ago." The exercise questions included: "I get more exercise now than I did three years ago," "I exercise approximately ___ hours per week," "I like to exercise more today than I did three years ago," and "I feel better when I exercise." The mental wellness question included: "I am more mentally well now than I was three years ago." The stress level question included: "My life is more stressed now than it was three years ago." The humor and laughter status questions included: "I am more humorous than I was three years ago," "I laugh more than I did three years ago," and "I read the comics in the newspaper or magazines." The cigarette smoking question included: "I
smoke more or less than I did three years ago (or I don’t smoke)." The lifestyle situation questions included: "I am or am not married," and "I have or do not have children living at home with me." The previously listed questions were included in the FHx to exemplify the subjects’ fitness today as compared with three years ago.

Cardiorespiratory after pulse instrumentation

The cardiorespiratory after pulse (CAP) exemplified the area of physiological wellness in this study. CAP has been considered the most important component of physical wellness and fitness (Anspaugh et al., 1991); thus, this study has used CAP as the assessment that best exemplified the subjects’ physiological area of wellness. CAP was actually the heart rate recorded after the subjects’ physical exercise. The concepts of CAP and bench step tests are explained in the following paragraphs.

The submaximal bench step test was given to the subjects in this study to estimate their state of physical wellness by measuring their cardiorespiratory after pulse (CAP). The basic assumption of this test was to predict the subjects’ VO$_2$ max (aerobic capacity), which was similar to that of the submaximal cycle test (Baumgartner & Jackson, 1975; Kurucz et al., 1969; Kasch & Boyer, 1968). Given an equal amount of work to accomplish (stepping up and down on a bench at the same rate and total time), the participant with a lower heart rate is in better cardiorespiratory physical condition and therefore had a higher VO$_2$ max. Bench-stepping at a prescribed cadence is used to standardize physical workload and is used extensively for mass testing because the only equipment it re-
quires is a bench of a specified height. Several subjects can be tested simultaneously (Appendix I).

A submaximal bench step test for healthy, middle-aged adults was developed by Kasch & Boyer (1968 [cited in Golding et al., 1982; and Kannel et al., 1976]) (Appendix I), and this is the bench step test used in this study. It is a 3-minute test conducted at 24 steps per minute on a bench 12 inches high. After completion of the test, the participants sat down, and their pulse was counted for one minute, beginning five seconds into the recovery period (after the bench step exercise). Norms for adult men and women are available in "The Y's Way to Physical Fitness" (Golding et al., 1982, p. 181) (Appendix I).

**Happiness instrumentation**

Happiness is the concept that best exemplifies the area of emotional wellness in this study. The Actual and Ideal Happiness Scale (AIHS) (Taylor, 1988) was used to assess the subjects' happiness. This 30-item written index asked the subjects to express their actual (present) happiness on each item and then to express their ideal (future) happiness on each of those same items. Actual happiness was defined as "current identified happiness based on an individual's perceptions of affective and cognitive happiness being experienced." Ideal happiness was defined as "future identified happiness based on an individual's perceptions of affective and cognitive happiness." The subjects were asked to evaluate their happiness using numbers from 1 to 99. It was the difference (discrepancy) of these two numerical values (actual and ideal) that determined
how happy a subject was on a particular item. A larger number discrepancy indicated a lower level of happiness. The 30 happiness items in this index were factored into five areas. These factors were physical appearance, desire for learning, social relationships, assisting others, and goal striving (Appendix H). In this study, it was found that happier subjects had lower scores on goal striving; this is an example of construct validity.

The AIHS was tested from a total sample of 823 university students, and the following statistics were derived from the factor analysis, item contrasts, and paired t-tests. The AIHS factors were developed based on happiness sources which were positively correlated with the subjective experience of happiness. Construct validity was demonstrated on the AIHS as several items appeared to cluster around four hypothesized factors when factor-analyzed. The four factors (minus the desire-for-learning factor) accounted for 12.91% of the actual happiness variance for both American and international students. In the ideal happiness responses, these same four factors accounted for 13.14% of the variance for the American students and 12.12% of the variance for the international students. The fifth factor, desire for learning, proved to be significant in the mean score comparisons and the paired t-test procedures. The individual paired t-tests showed 25 out of 30 of the AIHS items were significant at the p<.001 level for all subjects.
Summary of Instrumentation

Instrumentation was used to assess the four concepts of wellness: the humor concept representing the social area of wellness, the FHx concept representing the fitness area of wellness, the CAP concept representing the physiological area of wellness, and the happiness concept representing the emotional area of wellness. The instruments used in this study included four humor instruments, one FHx instrument, one CAP instrument, and one happiness instrument.

The four humor instruments included the Natural SH (Bartels, 1991), Svebak's HQ (Svebak, 1974a), the Situational RHQ (Lefcourt & Martin, 1986), and the Coping HS (Lefcourt & Martin, 1986). The FHx instrument included the FHx (Bartels, 1991). The CAP instrument was the Kasch Bench Step Test (Kasch & Boyer, 1968), and the happiness instrument was the Actual and Ideal Happiness Scale (Taylor, 1988).

The Natural SH evaluated the subjects' sense of humor through the use of rating and producing cartoons and jokes, and the subjects' self-report and researcher's observation report of the subjects' humor. Svebak's HQ assessed the respondents' reported ability to perceive the humorous aspects of situations in the environment (to "get the joke," so to speak) and assessed the degree to which subjects reported placing a high value on humor. The Situational HRQ focused on the behavioral manifestation of humor, which assessed the degree to which respondents reported laughing and smiling in a variety of life situations. Finally, the Coping HS measured more specifically the degree to which subjects reported making use of humor in coping with stressful or unpleasant events in their lives.
The FHx was used to assess the fitness area of wellness. This questionnaire assessed the subjects' fitness longevity over a time span of three years. The fitness areas assessed were those of physical wellness, exercise, mental wellness, stress level, humor, laughter, comics, cigarette smoking, and lifestyle situations of children and marriage.

The CAP assessment used in this study was the Kasch Bench Step Test (Kasch & Boyer, 1968). This bench step measured the subjects' heart rate after three minutes of exercise (stepping on a bench).

The happiness assessment used in this study was the AIHS (Taylor, 1988) (Appendix H). This scale basically compared the subjects' present happiness with their future happiness on 30 different items that had been factored into five clusters which emphasized construct validity.

Data Collection

The Iowa State University Committee on the Use of Human Subjects in Research reviewed this project and concluded that the rights and welfare of the human subjects were adequately protected, that the risks were outweighed by the potential benefits and expected value of knowledge sought, that confidentiality was assured, and that informed consent was obtained by appropriate procedures.

A pilot study was first performed, and subsequently, the actual study. The actual study consisted of giving the subjects a total of seven instruments. The instruments included four humor instruments (the Natural SH, Svebak's HQ, Situational RHQ, and Coping HS), one fitness instrument.
(the FHx), one CAP instrument (the Kasch Bench Step Test, 1968), and one happiness assessment (the Actual and Ideal Happiness Scale, 1988).

A total of 15 graduate students participated in the pilot study; this pilot study was designed to assess only the Natural SH. The data collection among these students was handled by distributing the Natural SH to one graduate counseling education class. The return rate was 100%, as the researcher handed the assessment out to the students in class and stayed with them until they finished it. After the pilot study, the researcher gave the other assessments to the 98 actual study subjects.

The researcher went to each exercise session, met with the participants, and exercised with each exercise group. The researcher announced research plans and the anticipated schedule two weeks ahead of data collection; thus, the subjects had two weeks to decide if they wanted to participate in the study. An informed consent form was first read and signed by each subject who agreed to participate (Appendix K).

The subjects were assessed either at the beginning, during, or after their exercise session, when the subjects volunteered, or had the time to begin their assessments. The order of the study went as follows: 1) structured interview between researcher and subjects; 2) visual observation by the researcher of the subjects, 3) self-report by the subjects, and 4) physical bench step test of the subjects. The assessments were given in the same order to each participant, beginning with the Natural SH.

The Natural SH was given to each subject by the researcher. This structured interview was conducted in a manner conducive to answering any
questions the subjects had. The following instructions were given to each subject before taking the Natural SH:

Your code number is __. Please use this code number on all forms. You have read and signed your consent form: Yes__ No__. Please relax. There are no right or wrong answers. This assessment should take approximately 20 minutes. Please ask the researcher if you have any questions. Feel free to laugh out loud. Do not get "stuck" on one question; if you do, please come back to it later. The last cartoon on p. 2 says, "...comin' through the rye!" (it is a bit hard to read). You will be given assessments to take home with you. Please remember to put your code number on each assessment. These take-home assessments should take approximately 40 minutes. Please do not discuss the content of these assessments with anyone else during the course of this study.

The visual observation was noted by assessing the subjects' laughter response and their type of humor while the test was in progress.

The three remaining take-home questionnaires were distributed to each subject (three humor questionnaires, one FHx questionnaire, one CAP questionnaire, and one happiness questionnaire), and their written responses determined the subjects' self-reports. The last step of the data collection was the actual physical testing of the subjects with the Kasch Bench Step Test (Kasch & Boyer, 1968). The bench step test was given to the subjects by the exercise physiologists of the exercise clinic.
Of the 98 subjects who participated, the complete return rate included 97 subjects. One subject failed to finish all of the questionnaires and the step test; thus, the final return rate was 98%.

Data collection included directions for each instrument. The subjects were informed about each of the instruments, the purpose of the study, and the response format. The subjects were also informed of the importance of responding honestly, the confidentiality of their responses, and that participation in the study was completely voluntary.

Data Analysis

Data analysis procedures were conducted for the data collected in this study. The purpose of the data analysis was expanded to four questions: 1) Are there subcomponents (factors) of the Natural Setting Humor (Natural SH) instrument? 2) Are there subcomponents (factors) of the Fitness History (FHx) instrument? 3A) How reliable (consistent) are the responses to humor and FHx? 3B) Are there significant relationships within the variables assessing humor, FHx, CAP, and happiness? 3C) Are there significant relationships across the variables humor, FHx, and happiness? 3D) Are there significant differences between humor, FHx, CAP, happiness, and the variables of marriage, children, gender, and individual questions? 3E) Are there significant differences between humor, FHx, CAP, happiness, and the variables of exercise groups, hours of exercise, and CAP categories? and 4) What selected factors, instruments, components of humor, FHx, CAP, and happiness can predict humor and CAP? To accomplish
this purpose, the data were analyzed using procedures according to the SPSS-X Information Analysis System, Release 3.0 (User's Guide, 1988).

Data for this study involved many and varied statistical analyses. A factor analysis provided the extraction of three factors from the Natural SH and two factors from the FHx. The three Natural SH factors were the Self-rank humor, the Humor with self, and the Humor with others. The two FHx factors were the Wellness assessment factor (WAF) and the Humor assessment factor (HAF). Reliabilities were calculated for the factors of the Natural SH and the FHx. Correlations were calculated for the humor, FHx, CAP, and happiness factors, instruments, and components. T-tests were done on the dichotomous variables of marriage, children, gender, and selected individual questions. Analyses of variance were calculated to analyze the mean differences in the different exercise groups on various humor, FHx, CAP, and happiness factors, instruments, and components. Multiple regressions were calculated to determine the prediction value of humor and CAP.
CHAPTER IV. RESULTS

The purpose of this study was to investigate the wellness concepts of humor, Fitness History (FHx), cardiorespiratory after pulse (CAP), and happiness. The data analysis was accomplished to explore the following four research questions:

1. Are there subcomponents (factors) of the Natural Setting Humor instrument (Natural SH)?
2. Are there subcomponents (factors) of the Fitness History (FHx) instrument?
3A. How reliable (consistent) are the responses to humor and FHx?
3B. Are there significant relationships within the variables assessing humor, FHx, CAP, and happiness?
3C. Are there significant relationships across the variables humor, FHx, and happiness?
3D. Are there significant differences between humor, FHx, CAP, happiness, and the variables of marriage, children, gender, and individual questions?
3E. Are there significant differences between humor, FHx, CAP, happiness, and the variables of exercise groups, hours of exercise, and CAP categories?
4. What selected factors, instruments, components of humor, FHx, CAP, and happiness can predict humor and CAP?

This chapter will present the descriptive data, the overview of analysis, and the results of the statistical analyses.
Descriptive Data

The participants in this study included 98 subjects from six different exercise groups. All subjects completed the entire study except for one, who dropped out after taking the first instrument only, the Natural SH; thus, the data included 98 subject responses for the data that came from the Natural SH and 97 subject responses from all of the other instruments. The subjects included 64 females and 34 males between the ages of 20 and 63, with a mean age of 42. The six exercise groups included 15 morning fitness participants (who ran, walked, or cycled), 17 morning swimmers, 23 noon aerobic participants, 14 noon fitness participants (who ran, walked, or cycled), 24 evening fitness participants (who ran, walked, or cycled), and five evening aerobic participants. Seventy-one subjects did not have children at home and 26 subjects did have children at home. Sixty-seven subjects were married and 30 subjects were not married at the present time.

The following descriptive statistics were from the Fitness History (FHx) (Appendix G). The FHx consisted of 13 questions about physical wellness, exercise, mental wellness, stress level, humor, laughter, and comics, tobacco smoking, and lifestyle situations. The FHx questions that ask for a comparison of the present (today) with three years ago are in Table 1. Over two-thirds of the subjects responded with "more today than three years ago" in the following question areas: physically well (68%), exercise (69%), mentally well (81%), and likes to exercise (78%). The percentages of subjects that responded with "more today than three years ago" in other question areas were as follows: humorous (55%) and laugh
(60%). Fifty-six percent of the subjects responded with "less stress today than three years ago," 35% responded with "more stress today than three years ago," and 8% said their stress level today was the same as compared with their stress level of three years ago. Ninety-one percent of the subjects responded with "I don't smoke."

In conclusion, the majority of subjects responded with "more today than three years ago" in six of the eight questions, with "less today than three years ago" on the question about stress, and a great majority responded with "I don't smoke" on the smoking question.

The FHx questions that ask for "yes," "no," or "same" responses are in Table 2. The majority of subjects responded with "yes" answers to the areas listed as the following: read comics (71%), feels better with exercise (98%), and marriage (68%). The only area that showed a majority of subjects with the "no" response was in the children area; 72% did not have children at home. One subject answered with "same" on the question, "I feel better with exercise."

Overview of Analysis

This study examined four major concepts of wellness, including humor, Fitness History (FHx), cardiorespiratory after pulse (CAP), and happiness, which included 39 variables. These variables were grouped into units, then discussed and analyzed the units individually for discussion purposes (Figures 1a and 1b).

The units consisted of the following: Humor with 16 humor components which included 11 questions from the Natural SH, one total Natural SH
Table 1. Fitness History (FHx) comparisons of past (3 years ago) and present (today): Numbers and percentages (n=97)

<table>
<thead>
<tr>
<th>Questions</th>
<th>More</th>
<th>Less</th>
<th>Same</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>N</td>
<td>%</td>
<td>N</td>
</tr>
<tr>
<td>Physically well</td>
<td>67</td>
<td>68.4</td>
<td>23</td>
</tr>
<tr>
<td>Exercise</td>
<td>68</td>
<td>69.4</td>
<td>18</td>
</tr>
<tr>
<td>Mentally well</td>
<td>79</td>
<td>80.6</td>
<td>8</td>
</tr>
<tr>
<td>Stress</td>
<td>34</td>
<td>34.7</td>
<td>55</td>
</tr>
<tr>
<td>Likes to exercise</td>
<td>76</td>
<td>77.6</td>
<td>12</td>
</tr>
<tr>
<td>Humorous</td>
<td>54</td>
<td>55.1</td>
<td>19</td>
</tr>
<tr>
<td>Laugh</td>
<td>59</td>
<td>60.2</td>
<td>16</td>
</tr>
<tr>
<td>Smoke</td>
<td>5</td>
<td>5.1</td>
<td>3</td>
</tr>
</tbody>
</table>

Table 2. Fitness History instrument comparisons: Numbers and percentages (n=97)

<table>
<thead>
<tr>
<th>Questions</th>
<th>Yes</th>
<th>No</th>
<th>Same*</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>N</td>
<td>%</td>
<td>N</td>
</tr>
<tr>
<td>Read comics</td>
<td>70</td>
<td>71.4</td>
<td>27</td>
</tr>
<tr>
<td>Feels better with exercise</td>
<td>96</td>
<td>98.0</td>
<td>1</td>
</tr>
<tr>
<td>Children (at home)</td>
<td>25</td>
<td>25.5</td>
<td>71</td>
</tr>
<tr>
<td>Marriage</td>
<td>67</td>
<td>68.4</td>
<td>30</td>
</tr>
</tbody>
</table>

*I feel the same with exercise or without exercise.*
Figure 1a. The individual units of humor, FHx, CAP, and happiness and the components thereof

*Figure not to scale.

*Listed components in Figure 1b.
Humor Unit:
Natural Setting Humor instrument (Natural SH)
1. Twelve cartoons rating
2. Six written jokes rating
3. Nine one-line jokes
4. Four cartoon answers
5. Number of laughs (as estimated by subjects)
6. Humorous? (as rated by subject)
7. Humorous story (estimated by subjects and researcher)
8. Colleague's rank of subjects' humor
9. Type of humor (as estimated by researcher)
10. Number of laughs (as estimated by researcher)
11. Humorous (as estimated by researcher)
12. Natural SH instrument total
13. Svebak's HQ instrument
14. Situational RHQ instrument
15. Coping HS instrument
16. Composite Humor score (total of all humor instruments)

Fitness History (FHx) Unit:
FHx instrument
17. Physically well (more, less, same)
18. Exercise (more, less, same)
19. Mentally well (more, less, same)
20. Stress (more, less, same)
21. Humorous (more, less, same)
22. Exercise (1-8 or more hours per week)
23. Children living at home or not
24. Married or not
25. Like to exercise (more, less, same)
26. Smoke (more, less, don't smoke)
27. Laugh (more, less, same)
28. Read comics (yes, no)
29. Feel better with exercise (yes, no)
30. Age
31. Gender
32. Composite FHx score (total FHx)

CAP Unit:
33. Cardiorespiratory After Pulse (CAP)

Happiness Unit:
Actual Ideal Happiness Scale (AIHS)
34. Physical appearance factor
35. Desire for learning factor
36. Social relationships factor
37. Assisting others factor
38. Goal striving factor
39. Composite Happiness score

Figure 1b. Listed components
score, the three other humor instrument scores (Svebak's HQ, Situational RHQ, and Coping HS), and one Composite Humor score; FHx with 16 components which included 13 FHx questions, two components of gender and age, and one Composite FHx score; CAP with one score for cardiorespiratory after pulse; and happiness unit with five factors including physical appearance, desire for learning, social relationships, assisting others, and goal striving, and one Composite Happiness score.

The various instrument scores from these four individual units of humor, FHx, CAP, and happiness are shown in Table 3. This table summarizes the maximum score, range of scores, mean, and standard deviations found for each of the instruments. The humor unit consisted of the four humor instruments: 1) the Natural SH, 2) Svebak's HQ, 3) Situational RHQ, and 4) Coping HS and the four humor instruments' total score, and 5) the Composite Humor score. The FHx unit consisted of one instrument, the Fitness History (FHx), two components for gender and age, and the Composite FHx score. The FHx instrument included 13 questions that totaled to a possible 22 points (two points were given for each positive answer and one point for each "same" answer, and a -1 for each negative answer). The CAP unit consisted of one assessment, the Kasch Bench Step Test (Kasch & Boyer, 1968), which included the cardiorespiratory after pulse (CAP) scores. The happiness unit consisted of one instrument, the Actual and Ideal Happiness Scale (AIHS), that included five factors (including physical appearance, desire for learning, social relationships, assisting others, and goal striving) from a previous factor analysis study and one Composite Happiness score (total happiness score) of these five factors.
Table 3. Summary of humor, Fitness History (FHx), cardiorespiratory after pulse (CAP), and happiness instrument scores

<table>
<thead>
<tr>
<th></th>
<th>Maximum score</th>
<th>Range</th>
<th>Mean</th>
<th>S.D.</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Humor:</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Natural setting humor instrument (Natural SH)</td>
<td>139</td>
<td>26 - 115</td>
<td>77.88</td>
<td>14.10</td>
</tr>
<tr>
<td>Svebak's HQ</td>
<td>56</td>
<td>22 - 53</td>
<td>41.64</td>
<td>5.57</td>
</tr>
<tr>
<td>Situational RHQ</td>
<td>84</td>
<td>19 - 70</td>
<td>37.08</td>
<td>10.08</td>
</tr>
<tr>
<td>Coping HS</td>
<td>28</td>
<td>11 - 27</td>
<td>20.02</td>
<td>3.51</td>
</tr>
<tr>
<td>Composite Humor score</td>
<td>307</td>
<td>82 - 228</td>
<td>164.46</td>
<td>22.4</td>
</tr>
<tr>
<td><strong>FHx:</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Composite FHx score</td>
<td>22</td>
<td>-3 - 15*</td>
<td>8.75</td>
<td>3.54</td>
</tr>
<tr>
<td><strong>CAP:</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>CAP</td>
<td>--</td>
<td>65 - 158</td>
<td>104.23</td>
<td>19.12</td>
</tr>
<tr>
<td><strong>Happiness:</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Composite Happiness score</td>
<td>2970</td>
<td>0 - 1057</td>
<td>409.62</td>
<td>246.04</td>
</tr>
<tr>
<td>Factors</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Physical appearance (6 items)</td>
<td>594</td>
<td>0 - 270</td>
<td>89.22</td>
<td>69.10</td>
</tr>
<tr>
<td>Desire for learning (6 items)</td>
<td>594</td>
<td>0 - 236</td>
<td>56.56</td>
<td>50.15</td>
</tr>
<tr>
<td>Social relationships (7 items)</td>
<td>693</td>
<td>0 - 250</td>
<td>72.02</td>
<td>60.27</td>
</tr>
<tr>
<td>Assisting others (5 items)</td>
<td>495</td>
<td>0 - 335</td>
<td>83.02</td>
<td>75.20</td>
</tr>
<tr>
<td>Goal striving (6 items)</td>
<td>594</td>
<td>0 - 364</td>
<td>107.18</td>
<td>84.95</td>
</tr>
</tbody>
</table>

*Negative score is possible (coded as +1, -1, 0).
In this study, a factor analysis provided the extraction of three factors from the Natural SH and two factors from the FHx. Reliabilities were calculated on the factors of the Natural SH and the FHx. Correlations were computed for the humor, FHx, CAP, and happiness factors, instruments, and components. T-tests were completed on the dichotomous variables of marriage, children, gender, and selected individual questions from the humor instruments. One-way analyses of variance were used to analyze the mean differences in the different exercise groups on various humor, FHx, CAP, and happiness factors, instruments, and components. Multiple regressions were used to determine the prediction value of humor and CAP.

Statistical Analysis

The statistical analyses of this study and the four research questions previously listed above are examined in the following paragraphs. Results are presented by research questions and null hypotheses.

Research Question 1

Are there subcomponents (factors) of the Natural Setting Humor (Natural SH) instrument?

Because of the large number of individual items and questions for the Natural SH and FHx instruments, a factor analysis was completed to determine if these variables could be represented by a smaller number of variables (factors). The factor loadings were rotated to assist the
researcher in interpreting the factor analysis. The varimax rotation was selected for this research.

In Table 4 the rotated factors and the factor loadings for the Natural SH instrument are presented. Three factors from the Natural SH instrument were extracted by means of Principal Axis Factoring. The first of the three factors, labeled the self-rank humor (S Rank H) factor, included the rating of 12 cartoons and six jokes, the number of times subjects estimated they laughed during the assessment period, and the self-rating of the humorous story as told by the subjects (Appendix C). The second factor, labeled the humor with self (HW Self) factor, included the subjects' completion of the nine one-line jokes, the researcher's estimate of the type of humor exhibited by the subjects during the assessment period, and the researcher's count of the number of times the subjects laughed while taking the Natural SH instrument (Appendix C). The third factor, labeled the humor with others (HW Others) factor, consisted of colleague rating of the subjects' sense of humor, the subjects' cartoon answers, and the rating of the subjects' humorous story by both the subjects themselves and the researcher (Appendix C). There were no items from the Natural SH instrument that did not factor in the factor analysis.

Research Question 2

Are there subcomponents (factors) of the Fitness History (FHx) instrument?

In the following Table 5, the rotated factor matrix and the factor transformation matrix of the FHx are presented. The first factor, labeled
Table 4. The factor loadings (rotated factor matrix) of the Natural Setting Humor (Natural SH) instrument

<table>
<thead>
<tr>
<th>Components</th>
<th>Factor 1</th>
<th>Factor 2</th>
<th>Factor 3</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Self-ranked humor (S Rank H)</td>
<td>Humor with self (HW Self)</td>
<td>Humor with others (HW Others)</td>
</tr>
<tr>
<td>Rating of 12 cartoons</td>
<td>.76470</td>
<td>.08298</td>
<td>.05394</td>
</tr>
<tr>
<td>Rating of 6 jokes</td>
<td>.59164</td>
<td>.35957</td>
<td>-.02430</td>
</tr>
<tr>
<td>Number of laughs (estimated by subject)</td>
<td>.57143</td>
<td>.15784</td>
<td>.42501</td>
</tr>
<tr>
<td>Humor story (as rated by subject)</td>
<td>.39128</td>
<td>.01341</td>
<td>.12714</td>
</tr>
<tr>
<td>Completion of 9 one-line jokes</td>
<td>.02102</td>
<td>.65740</td>
<td>.16483</td>
</tr>
<tr>
<td>Type of humor</td>
<td>.1226</td>
<td>.51103</td>
<td>.30989</td>
</tr>
<tr>
<td>Number of laughs (as estimated by researcher)</td>
<td>.19801</td>
<td>.45154</td>
<td>.13552</td>
</tr>
<tr>
<td>Humor rating by colleague</td>
<td>.12662</td>
<td>.15833</td>
<td>.70447</td>
</tr>
<tr>
<td>Subjects' cartoon answers</td>
<td>.04900</td>
<td>.35160</td>
<td>.47277</td>
</tr>
<tr>
<td>Humor story rating (as rated by subjects and researcher)</td>
<td>.20800</td>
<td>.34143</td>
<td>.42516</td>
</tr>
</tbody>
</table>
Table 5. The factor loadings (rotated factor matrix) of the Fitness History (FHx) instrument

<table>
<thead>
<tr>
<th>Components</th>
<th>Factor 1 Wellness assessment (WAF)</th>
<th>Factor 2 Humor assessment (HAF)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Exercise (more or less)</td>
<td>.87002</td>
<td>.02090</td>
</tr>
<tr>
<td>Physically well (more or less)</td>
<td>.69584</td>
<td>.12651</td>
</tr>
<tr>
<td>Likes to exercise (more or less)</td>
<td>.62506</td>
<td>-.16983</td>
</tr>
<tr>
<td>Mentally well (more or less)</td>
<td>.46148</td>
<td>.27438</td>
</tr>
<tr>
<td>Humorous (more or less)</td>
<td>-.04738</td>
<td>.89467</td>
</tr>
<tr>
<td>Laugh (more or less)</td>
<td>.12227</td>
<td>.79854</td>
</tr>
</tbody>
</table>

The wellness assessment factor (WAF), consisted of the following four questions from the FHx instrument: "I get more exercise or less exercise today than I did three years ago"; "I am more physically well or less physically well today than I was three years ago"; "I like to exercise more or less today than I did three years ago"; and "I am more mentally well or less mentally well today than I was three years ago" (Appendix G).

The second factor, labeled the humor assessment factor (HAF), consisted of two questions from the FHx: "I am more humorous or less humorous today than I was three years ago"; and "I laugh more or less than I did three years ago" (Appendix G).

The seven items not included in the factor analysis for the FHx instruments, and thus treated as individual items in this study, were the
following: married or not, feeling better with exercise, stress, smoking, reading comics, hours of exercise per week, and children at home or not.

Research Question 3A

How reliable (consistent) are the responses to humor and FHx?

After having done the factor analysis, reliability was calculated on the resulting factors. This reliability calculation was necessary to determine if the factors were reliable enough to be classified and used as factors in the subsequent analyses. Alpha coefficients were used to determine the reliability of the factors. Inter-item correlations were calculated to see the degree to which individual items in the factors were related.

The correlation matrices of the individual factors, and their inter-item correlations, are shown in Tables 6 through 11. In Tables 6, 7, and 8 the correlation matrices of the three factors of the Natural SH instrument are presented. In Table 6 the S Rank H (Factor 1) is presented, in Table 7 the HW Self (Factor 2) is presented, and in Table 8 the HW Others (Factor 3) is presented. The FHx instrument correlation matrices are shown in Table 9 (WAF, Factor 1) and Table 10 (HAF, Factor 2). The combined total inter-item correlations of all the factors are found in Table 11. In conclusion, the mean inter-item correlation (.70) for the HAF of the FHx instrument is the highest, which indicates that the items in the HAF are the most correlated to each other. The items in all three factors (of the Natural SH instrument) combined are the least correlated, as they have the lowest inter-item correlation number (.25).
Table 6. Correlation matrix of S Rank H (Factor 1) of Natural SH instrument

<table>
<thead>
<tr>
<th>Components</th>
<th>Cartoons (rating of 12)</th>
<th>Jokes (rating of 6)</th>
<th># Laughs (estimated by subjects)</th>
<th>Humor story (estimated by subjects)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cartoons</td>
<td>1.000</td>
<td>.4954</td>
<td>.4617</td>
<td>.3097</td>
</tr>
<tr>
<td>Jokes</td>
<td></td>
<td>1.000</td>
<td>.3833</td>
<td>.1985</td>
</tr>
<tr>
<td>Number of laughs</td>
<td></td>
<td></td>
<td>1.000</td>
<td>.3077</td>
</tr>
<tr>
<td>Humor story</td>
<td></td>
<td></td>
<td></td>
<td>1.000</td>
</tr>
</tbody>
</table>

Table 7. Correlation matrix of HW Self (Factor 2) of Natural SH instrument

<table>
<thead>
<tr>
<th>Components</th>
<th>One-line jokes (completion of 9)</th>
<th>Type (estimated by researcher)</th>
<th># Laughs (estimated by researcher)</th>
</tr>
</thead>
<tbody>
<tr>
<td>One-line jokes</td>
<td>1.000</td>
<td>.3191</td>
<td>.3581</td>
</tr>
<tr>
<td>Type</td>
<td></td>
<td>1.000</td>
<td>.3701</td>
</tr>
<tr>
<td>Number of laughs</td>
<td></td>
<td></td>
<td>1.000</td>
</tr>
</tbody>
</table>
Table 8. Correlation matrix of HW Others (Factor 3) of Natural SH instrument

<table>
<thead>
<tr>
<th>Components</th>
<th>Friend</th>
<th>Fill-in cartoons</th>
<th>Humor story</th>
</tr>
</thead>
<tbody>
<tr>
<td>Humor rating by colleague</td>
<td>1.000</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Subjects' cartoon answers</td>
<td>.3782</td>
<td>1.000</td>
<td></td>
</tr>
<tr>
<td>Humor story rating (as rated by subjects and researcher)</td>
<td>.3612</td>
<td>.3797</td>
<td>1.000</td>
</tr>
</tbody>
</table>

Table 9. Correlation matrix of WAF (Factor 1) of FHx instrument

<table>
<thead>
<tr>
<th>Items</th>
<th>Exercise</th>
<th>Physically well</th>
<th>Likes exercise</th>
<th>Mentally well</th>
</tr>
</thead>
<tbody>
<tr>
<td>Exercise (more or less)</td>
<td>1.000</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Physically well (more or less)</td>
<td>.6208</td>
<td>1.000</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Likes to exercise (more or less)</td>
<td>.5144</td>
<td>.4057</td>
<td>1.000</td>
<td></td>
</tr>
<tr>
<td>Mentally well (more or less)</td>
<td>.4006</td>
<td>.2583</td>
<td>.3035</td>
<td>1.000</td>
</tr>
</tbody>
</table>
Table 10. Correlation matrix of HAF (Factor 2) of FHx instrument

<table>
<thead>
<tr>
<th>Items</th>
<th>Humor</th>
<th>Laugh</th>
</tr>
</thead>
<tbody>
<tr>
<td>Humorous (more or less)</td>
<td>1.000</td>
<td></td>
</tr>
<tr>
<td>Laugh (more or less)</td>
<td>.6967</td>
<td>1.000</td>
</tr>
</tbody>
</table>

Table 11. Total mean inter-item correlations (reliabilities) for Natural Setting Humor instrument (Natural SH) factors and Fitness History instrument (FHx) factors

<table>
<thead>
<tr>
<th></th>
<th>Mean inter-item correlation</th>
<th>Alpha</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Natural SH instrument:</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Self-rank humor (S Rank H) (Factor 1)</td>
<td>.36</td>
<td>.53</td>
</tr>
<tr>
<td>Humor with self (HW Self) (Factor 2)</td>
<td>.35</td>
<td>.57</td>
</tr>
<tr>
<td>Humor with others (HW Others) (Factor 3)</td>
<td>.37</td>
<td>.56</td>
</tr>
<tr>
<td>Factors combined (Factors 1,2,3)</td>
<td>.25</td>
<td>.67</td>
</tr>
<tr>
<td><strong>FHx instrument:</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Wellness assessment factor (WAF) (Factor 1)</td>
<td>.42</td>
<td>.75</td>
</tr>
<tr>
<td>Humor assessment factor (HAF) (Factor 2)</td>
<td>.70</td>
<td>.82</td>
</tr>
</tbody>
</table>
Table 11 also shows the alpha coefficients for the factors in the Natural SH instrument and in the FHx instrument. The S Rank H factor (Factor 1 of the Natural SH instrument) shows the lowest reliability (.53) of the individual factors, and the WAF (.75) and HAF (.82) factors from the FHx instrument show the highest reliabilities.

**Research Question 3B**

Are there significant relationships within the variables assessing humor, FHx, CAP, and happiness?

The correlation matrix used all the humor factors, instruments, components, and Composite Humor score (16), FHx factors, components, and Composite FHx score (16), CAP (1), and happiness factors and Composite Happiness score (6) found in the various instruments used with the 97 subjects in the six exercise groups. The 39 by 39 correlation matrix is not shown in entirety because of size; however, significant correlations were isolated, grouped, and used in subsequent analyses.

Selected humor factors and instruments, FHx instrument and components, CAP, and happiness factors and Composite Happiness score and their correlations are shown in the following Tables 12-14. For the sake of brevity and interpretation, the correlations are divided into the following four wellness concepts: 1) humor, 2) FHx, 3) CAP, and 4) happiness.

**Humor:** In Table 12 the correlation coefficients among eight selected humor components, including humor factors, humor instruments, and the Composite Humor score are presented. The first three humor factors are
Table 12. Correlations among humor factors, instruments, and Composite 
Humor score

<table>
<thead>
<tr>
<th>Factors and composites</th>
<th>Humor</th>
<th>Situational</th>
<th>Coping</th>
<th>Natural</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>S rank H</td>
<td>HW Self</td>
<td>HW Others</td>
<td>Svebak's HQ</td>
</tr>
<tr>
<td>Humor factors:</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>S rank H</td>
<td>1.00</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>HW Self</td>
<td>.28**</td>
<td>.15</td>
<td>.31**</td>
<td>1.00</td>
</tr>
<tr>
<td>HW Others</td>
<td>.27**</td>
<td>.41**</td>
<td>1.00</td>
<td></td>
</tr>
<tr>
<td>Humor instruments:</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Svebak's HQ</td>
<td>.27*</td>
<td>.15</td>
<td>.31**</td>
<td>1.00</td>
</tr>
<tr>
<td>Situational RHQ</td>
<td>.43*</td>
<td>.15</td>
<td>.25*</td>
<td>.41**</td>
</tr>
<tr>
<td>Coping HS</td>
<td>.47**</td>
<td>.13</td>
<td>.29*</td>
<td>.50**</td>
</tr>
<tr>
<td>Natural SH</td>
<td>.71**</td>
<td>.83**</td>
<td>.65**</td>
<td>.30**</td>
</tr>
</tbody>
</table>

Composite: 
Composite Humor score (all humor instruments) .70** .37** .54** .68** .82** .72** .70** 1.00

*S rank H = Self-rank humor; HW Self = Humor with self; HW Others = Humor with others.

**Significant at the .01 level.
the three Natural SH instrument factors including: 1) S Rank H, 2) HW Self, and 3) HW Others. The three additional humor instruments are the 4) Svebak's SHQ, 5) Situational HRQ, and 6) Coping HS. The seventh component is the 7) Natural SH instrument total and the eighth humor component consisted of the 8) Composite Humor score of all four of the humor instruments (Natural SH, Svebak's HQ, Situational RHQ, and Coping HS).

The highest correlation was found between the Natural SH instrument and Composite Humor score (.70 at p<.01), which indicates that the Natural SH instrument and the Composite Humor score are highly correlated with each other. On the other hand, the lowest correlations were found between S Rank H and HW Self (.28, p<.01) and HW Others (.27, p<.01), which indicate a lower degree of correlation among these factors of the Natural SH instrument.

FHx: In Table 13 the correlation coefficients among CAP, gender, and age (gender and age are two components of the FHx instrument) are presented. In Table 13, CAP was correlated with gender at .31 (p<.01), which indicates that men tended to have a lower CAP on average than women. The -.28 correlation between gender and age indicates that men tended to be older on average than the women (men coded as 1 and females coded as 2 in the computer program).

CAP: The CAP correlation was discussed in the previous FHx section, with men showing a significantly lower CAP than women. The CAP correlation with age was not significant.

Happiness: The correlations among the happiness factors and Composite Happiness score are shown in Table 14. The highest correlations
Table 13. Correlations among CAP, gender, and age

<table>
<thead>
<tr>
<th>Selected components</th>
<th>CAP</th>
<th>FHx</th>
<th>Gender</th>
<th>Age</th>
</tr>
</thead>
<tbody>
<tr>
<td>CAP</td>
<td>1.00</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>FHx</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Gender</td>
<td>.31**a,b</td>
<td>1.00</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Age</td>
<td>-.003</td>
<td>-.28**c</td>
<td>1.00</td>
<td></td>
</tr>
</tbody>
</table>

*aMales coded as "1"; females coded as "2."
bMales have lower CAP on average than females.
cMales are older on average than females.
**Significant at the .01 level.

were found between Composite Happiness score and physical appearance (.64), desire for learning (.74), social relationships (.72), and assisting others (.64) (significant at the .01 level). These high correlations indicate that these four factors are indeed correlated with the Composite Happiness score. The lowest correlations were found between physical appearance and goal striving (-.17) and between social relationships with assisting others (.18). The negative correlations between goal striving and the other factors of happiness indicate that as overall happiness decreases, goal striving happiness increases (since a higher score on the happiness scale (AIHS) indicates a lower level of happiness).

Research Question 3C

Are there significant relationships across the variables humor, FHx, and happiness?
Table 14. Correlations among happiness factors and Composite Happiness score

<table>
<thead>
<tr>
<th>Factors and Composite</th>
<th>Physical Appearance</th>
<th>Desire for Learning</th>
<th>Social Relationships</th>
<th>Assisting Others</th>
<th>Goal Striving</th>
<th>Composite Happiness Score</th>
</tr>
</thead>
<tbody>
<tr>
<td>Physical appearance</td>
<td>1.00</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Desire for learning</td>
<td>.37**</td>
<td>1.00</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Social relationships</td>
<td>.36**</td>
<td>.43**</td>
<td>1.00</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Assisting others</td>
<td>.25**</td>
<td>.47**</td>
<td>.18*</td>
<td>1.00</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Goal striving</td>
<td>-.17*</td>
<td>-.35**</td>
<td>-.25**</td>
<td>-.30**</td>
<td>1.00</td>
<td></td>
</tr>
<tr>
<td>Composite</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Composite Happiness score</td>
<td>.64**</td>
<td>.74**</td>
<td>.72**</td>
<td>.64**</td>
<td>-.42**</td>
<td>1.00</td>
</tr>
</tbody>
</table>

*Significant at the .05 level.
**Significant at the .01 level.
Additional correlations were done with various humor, CAP, FHx, and happiness components. Correlations were calculated for selected factors of humor (S Rank H, HW Self, HW Others), humor instruments (Natural SH, Svebak's HQ, Situational RHQ, and Coping HS), Composite Humor score, and selected FHx factors (WAF and HAF) and components (married or not, reads the comics, feeling better with exercise, age, and gender) of the FHx instrument. The listed factors, instruments, and components were chosen on the basis of previous hypotheses, questions, and the researcher's interest. The resulting significant correlations among these factors, instruments, and components are discussed in the following sections.

The significant correlation coefficients are shown in Table 15. This table shows the summary of significant correlations of various humor factors, instruments, and Composite Humor score, and their relationships to other FHx instrument factors and components, and two happiness factors and one Composite Happiness score.

Null Hypothesis 1 There are no significant relationships across the factors and component scores of humor, FHx, and happiness.

The highest correlations were found between Situational RHQ and age (-.36) and Composite Humor and marriage (-.31). Thus, there is a tendency for Situational RHQ and Composite Humor scores to decrease as the subjects are older in age. The lowest significant correlations were found between Composite Humor score and WAF (.17) (Factor 1 of FHx instrument), between HW Others (Factor 3 of Natural SH instrument) and reads comics (component of FHx instrument) (.17), and between HW Others (Factor 2 of Natural SH
Table 15. Significant correlations among humor factors, instruments, and components, selected Fitness History (FHx) factors and components, and happiness factors and Composite Happiness score.

<table>
<thead>
<tr>
<th>Selected components</th>
<th>Natural Svebak's</th>
<th>Situational Coping Humor</th>
</tr>
</thead>
<tbody>
<tr>
<td>S rank</td>
<td>H</td>
<td>Self</td>
</tr>
<tr>
<td>Humor components</td>
<td></td>
<td></td>
</tr>
<tr>
<td>factors:</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Wellness assessment factor (WAF)</td>
<td>.20*</td>
<td>.21*</td>
</tr>
<tr>
<td>Humor assessment factor (HAF)</td>
<td>.23**</td>
<td></td>
</tr>
<tr>
<td>Components:</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Married or not</td>
<td></td>
<td></td>
</tr>
<tr>
<td>(yes or no)</td>
<td></td>
<td>-.18*</td>
</tr>
<tr>
<td>Reads comics</td>
<td></td>
<td>.17*</td>
</tr>
<tr>
<td>(yes, no, some)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Feeling better with exercise</td>
<td></td>
<td>.24**</td>
</tr>
<tr>
<td>Age</td>
<td></td>
<td>-.17*</td>
</tr>
<tr>
<td>Gender</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Happiness factors:</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Physical appearance</td>
<td>.18*</td>
<td>.24**</td>
</tr>
<tr>
<td>Goal striving</td>
<td></td>
<td>-.18*</td>
</tr>
<tr>
<td>Composite:</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Happiness score</td>
<td></td>
<td>.22**</td>
</tr>
</tbody>
</table>

*S rank H = Self-rank humor; HW Self = Humor with self; HW Others = Humor with others.

*Significant at the .05 level.

**Significant at the .01 level.
instrument) and age (component of FHx instrument) (-.17). These low correlations show less correlation among the above listed factors and components. The negative married component correlation coefficients (for FHx) show that when subjects are married, their humor scores tend to decrease on the following humor instruments and Composite Humor score; those of Svebak's HQ (-.18), Coping HS (-.21), and Composite Humor (-.31). The negative correlation coefficients found in the age component (of the FHx instrument) show that as subjects are older in age, the scores on certain factors, instruments, and components decrease, as in the following: the factor HW Others (of the Natural SH instrument) (-.17), Situational RHQ (-.36), and Composite Humor score (-.24). The remaining values correlate positively with the humor values.

The correlation coefficients of FHx instrument factors and components and happiness factors and Composite Happiness score and their relationship to other FHx instrument factors and components and CAP are shown in Table 16.

The highest correlations were found among the HAF factor (for FHx) and age (-.36) and among the happiness factor assisting others and age (-.32). Thus, HAF factor has a tendency to increase as the subjects are younger in age and the happiness factor of assisting others decreases as the subjects are older in age. The lowest correlations include having children at home and WAF (from FHx instrument) (-.17) and CAP and feeling better with exercise (component of FHx instrument) (-.17). Thus, if subjects have children at home, their WAF factor tends to increase.
Table 16. Significant correlations among Fitness History (FHx) factors and components and happiness factors and Composite Happiness score and selected FHx factors and components and cardiorespiratory after pulse (CAP) components

<table>
<thead>
<tr>
<th>Selected components</th>
<th>FHx components</th>
<th>Feeling better w/exercise</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Hours of exercise</td>
<td>Chil-</td>
</tr>
<tr>
<td>Age Gender</td>
<td>Hours of exercise</td>
<td>Chil-</td>
</tr>
</tbody>
</table>

FHx:

Factors:
- Wellness assessment factor (WAF): -.21* .21* .18* -.17*
- Humor assessment factor (HAF): -.36* -.19* -.25** .20*

Components:
- Number of hours of exercise per week: -.22*
- Read comics: -.23** .22*

Feeling better with exercise: -.17*

Happiness:

Factors:
- Physical appearance: -.24** .25** -.19* .20* .25**

*Significant at the .05 level.
**Significant at the .01 level.
Table 16. Continued

<table>
<thead>
<tr>
<th>Selected components</th>
<th>Age</th>
<th>Gender</th>
<th>Hours of exercise</th>
<th>Feeling better w/exercise</th>
<th>CAP</th>
</tr>
</thead>
<tbody>
<tr>
<td>Social relationships</td>
<td></td>
<td></td>
<td></td>
<td>.23**</td>
<td></td>
</tr>
<tr>
<td>Assisting others</td>
<td></td>
<td></td>
<td>-.32**</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Goal striving</td>
<td></td>
<td></td>
<td>.22*</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Composite:</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Composite Happiness</td>
<td></td>
<td></td>
<td>-.25**</td>
<td>.18*</td>
<td></td>
</tr>
</tbody>
</table>
Research Question 3D

Are there significant differences between humor, FHx, CAP, happiness, and the variables of marriage, children, gender, and individual questions?

Null Hypothesis 2 There are no significant differences between married and not married participants on the humor, FHx, CAP, and happiness scores.

The significant t-test results for marriage are presented in Table 17. Pooled variance estimates were used, as the F values were not significant at the .05 level. Situational RHQ had a mean for not married of 43.40 and a mean for married of 34.25 (two-tailed probability at <.001). Coping HS had a mean for not married of 21.10 and a mean for married of 19.54 (two-tailed probability at <0.042). Composite Humor score had a mean for not married of 174.90 and a mean for married at 159.79 (two-tailed probability of <.002). The other listed humor components, including the humor instrument Svebak HQ, the humor factors of S Rank H, HW Self, HW Others, the FHx factor of WAF, the happiness factor of physical appearance, and CAP score did not significantly differ (at the .05 level) with marriage.

With the instruments of Situational RHQ, Coping HS, and with the Composite Humor score, the null hypothesis was rejected, and the alternative null hypothesis of significant mean difference was accepted. Not
Table 17. Significant t-test results for married and not married subjects on selected humor, Fitness History (FHx), cardiorespiratory after pulse (CAP), and happiness components

<table>
<thead>
<tr>
<th>Components</th>
<th>Mean</th>
<th>S.D.</th>
<th>t-value</th>
<th>df</th>
<th>prob.</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Situational RHQ:</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Not married(^a)</td>
<td>43.40</td>
<td>10.93</td>
<td>4.53</td>
<td>95</td>
<td>0.000</td>
</tr>
<tr>
<td>Married(^b)</td>
<td>34.25</td>
<td>8.31</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Coping HS:</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Not married</td>
<td>21.10</td>
<td>2.92</td>
<td>2.06</td>
<td>95</td>
<td>0.042</td>
</tr>
<tr>
<td>Married</td>
<td>19.54</td>
<td>3.67</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Composite Humor score:</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Not married</td>
<td>174.90</td>
<td>20.12</td>
<td>3.21</td>
<td>95</td>
<td>0.002</td>
</tr>
<tr>
<td>Married</td>
<td>159.79</td>
<td>22.01</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

\(^a\)Not married, N=30.
\(^b\)Married, N=67.

Married subjects show significantly higher scores on Situational RHQ (mean for not married was 43.40, mean for married was 34.25), Coping HS (mean for not married was 21.10, mean for married was 19.54), and Composite Humor score (mean for not married was 174.90, mean for married was 159.79). With all other items, the mean differences were not significantly different, so the null hypothesis was retained.

**Null Hypothesis 3** There are no significant differences between those participants who have children at home and those who do not, on the humor, FHx, CAP, and happiness scores.
There were no significant differences between those who had children living at home or did not on any of the above listed humor instruments of Svebak's HQ, Situational RHQ, Coping HS, the Composite Humor score, the humor factors of S Rank H, HW Self, HW Others, the FHx factor of WAF, the happiness factor of physical appearance, and CAP. The null hypothesis was retained for all items (Appendix G).

Null Hypothesis 4 There are no significant differences between men and women participants on the humor, FHx, CAP, and happiness scores.

The significant and nonsignificant t-test results for gender are presented in Tables 18a and 18b. Significant mean differences were found in the following listed components. The Coping HS instrument mean for males was 19.00 and the mean for females was 20.57 (two-tailed probability of .035). The WAF factor of the FHx mean for males was .43 and the mean for females was .67 (two-tailed probability of .042). The happiness factor of physical appearance had a mean for males at 57.97 and a mean for females at 90.13 (two-tailed probability of .014). The CAP male mean was 96.12 and female mean was 108.60 (two-tailed probability of .002).

Females' higher Coping HS instrument scores indicated a greater level of humor than males and the males' lower happiness factor score of physical appearance indicated higher degree of happiness in physical appearance. The females showed higher scores on the WAF factor of the FHx and CAP. These higher scores indicated that females scored higher on the FHx factor of WAF and higher on CAP than males did. The other components of humor instruments including Svebak's HQ, Situational RHQ, the Composite Humor score, and the Natural S humor factors of S Rank H, HW Self, and HW Others
Table 18a. Significant t-tests of gender and selected humor, Fitness History (FHx), cardiorespiratory after pulse (CAP), and happiness components.

<table>
<thead>
<tr>
<th>Components</th>
<th>Males^</th>
<th>Females^</th>
<th>Pooled variance estimate</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Mean</td>
<td>S.D.</td>
<td>t-value\textsuperscript{b}</td>
</tr>
<tr>
<td>Humor:</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Coping HS:</td>
<td>19.00</td>
<td>3.21</td>
<td>-2.14*</td>
</tr>
<tr>
<td>Males\textsuperscript{c}</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Females\textsuperscript{d}</td>
<td>20.57</td>
<td>3.57</td>
<td>-2.06*</td>
</tr>
<tr>
<td>FHx:</td>
<td>57.97</td>
<td>48.52</td>
<td>-2.52*</td>
</tr>
<tr>
<td>Wellness assessment factor (WAF):</td>
<td>0.43</td>
<td>0.62</td>
<td>-2.06*</td>
</tr>
<tr>
<td>Males</td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>Females</td>
<td>0.67</td>
<td>0.51</td>
<td>-3.21**</td>
</tr>
<tr>
<td>Happiness:</td>
<td>90.13</td>
<td>65.36</td>
<td></td>
</tr>
<tr>
<td>Physical appearance:</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>CAP:</td>
<td>96.12</td>
<td>18.53</td>
<td></td>
</tr>
<tr>
<td>Males</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Females</td>
<td>108.60</td>
<td>18.10</td>
<td></td>
</tr>
</tbody>
</table>

\textsuperscript{a}df = 95.
\textsuperscript{b}Negative t-values indicate that the second mean is greater than the first.
\textsuperscript{c}Males, N=34.
\textsuperscript{d}Females, N=64.
\*Significant at the .05 level.
\**Significant at the .01 level.
Table 12b. Nonsignificant t-tests of gender and selected humor instruments, factors, and Composite Humor score

<table>
<thead>
<tr>
<th></th>
<th>Mean</th>
<th>S.D.</th>
<th>t-value&lt;sup&gt;b&lt;/sup&gt;</th>
<th>2-tail prob.</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Humor:</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Instruments:</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Svebak’s HQ</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Males&lt;sup&gt;c&lt;/sup&gt;</td>
<td>40.94</td>
<td>4.87</td>
<td>-0.91</td>
<td>0.37</td>
</tr>
<tr>
<td>Females&lt;sup&gt;d&lt;/sup&gt;</td>
<td>42.02</td>
<td>5.91</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Situational RHQ</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Males</td>
<td>35.35</td>
<td>10.00</td>
<td>-1.24</td>
<td>0.22</td>
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<tr>
<td>Females</td>
<td>38.02</td>
<td>10.08</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Factors:</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>S Rank H</td>
<td></td>
<td></td>
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</tr>
<tr>
<td>Males</td>
<td>9.85</td>
<td>1.53</td>
<td>-0.70</td>
<td>0.48</td>
</tr>
<tr>
<td>Females</td>
<td>10.11</td>
<td>1.75</td>
<td></td>
<td></td>
</tr>
<tr>
<td>HW Self</td>
<td></td>
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<tr>
<td>Males</td>
<td>8.55</td>
<td>2.70</td>
<td>0.43</td>
<td>0.67</td>
</tr>
<tr>
<td>Females</td>
<td>8.30</td>
<td>2.75</td>
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<td></td>
</tr>
</tbody>
</table>

<sup>a</sup>df=95.
<sup>b</sup>Negative t-values indicate that the second mean is greater than the first.
<sup>c</sup>Males, N=34.
<sup>d</sup>Females, N=64.
Table 18b. Continued

<table>
<thead>
<tr>
<th></th>
<th>Mean</th>
<th>S.D.</th>
<th>t-value</th>
<th>2-tail prob.</th>
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</thead>
<tbody>
<tr>
<td><strong>HW Others</strong></td>
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<td>4.41</td>
<td>1.23</td>
<td>1.08</td>
<td>0.28</td>
</tr>
<tr>
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<td>4.11</td>
<td>1.36</td>
<td></td>
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<tr>
<td><strong>Composite:</strong></td>
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<tr>
<td>Composite Humor score</td>
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<td>Males</td>
<td>161.38</td>
<td>20.70</td>
<td>0.99</td>
<td>0.32</td>
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<tr>
<td>Females</td>
<td>166.13</td>
<td>23.35</td>
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</table>
were not significantly different with gender at the .05 level of significance.

**Null Hypothesis 5** There are no significant differences between men and women participants on individual question scores on humor, FHx, CAP, and happiness scores.

The significant results of this t-test are seen in Table 19. The following components are listed in Table 19: CAP (cardiorespiratory after pulse) (Appendix J); telephone call at night (question 2, Situational RHQ, Appendix E); romantic evening with friend (question 10), Situational RHQ, Appendix E); effective coping and using humor (question 7, Coping HS, Appendix F); physical appearance (one of the five factors from the happiness index (AIHS) (Appendix H); body, shape, and size (question 2), satisfaction with physical appearance (question 10), concerned with physical appearance (question 22) (all from the AIHS, Appendix H); and computer error/standing in line (question 15, Situational RHQ, Appendix E).

The most significant differences were found between gender on CAP with the male mean of 96.12 and for females of 108.60 (two-tailed probability of .002) and effective coping with the male mean of 2.91 and the female mean of 3.37 (two-tailed probability of .005). (The pooled variance estimate was used when no significant difference in variance was found between the two groups in the F-test.) Thus, it is indicated that females had a higher CAP rate than males, and that females' higher effective coping score indicated a higher ability to use humor to cope with
Table 19. Significant t-test results for gender and individual questions and other humor, Fitness History (FHx), cardiorespiratory after pulse (CAP), and happiness components

<table>
<thead>
<tr>
<th>Components</th>
<th>Mean</th>
<th>S.D.</th>
<th>Pooled variance estimate</th>
<th>2-tail t-value&lt;sup&gt;b&lt;/sup&gt;</th>
<th>2-tail prob.</th>
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<td>CAP:</td>
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<td></td>
</tr>
<tr>
<td>Males</td>
<td>96.12</td>
<td>18.53</td>
<td>-3.21**</td>
<td>0.002</td>
<td></td>
</tr>
<tr>
<td>Females</td>
<td>108.60</td>
<td>18.10</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Humor:</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Situational RHQ</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Telephone call at night</td>
<td></td>
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<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Males</td>
<td>1.97</td>
<td>1.14</td>
<td>-2.10*</td>
<td>0.039</td>
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<tr>
<td>Females</td>
<td>2.46</td>
<td>1.08</td>
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<td></td>
<td></td>
</tr>
<tr>
<td>Romantic evening/humor</td>
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<td></td>
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<td></td>
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<tr>
<td>Males</td>
<td>1.80</td>
<td>0.81</td>
<td>-2.61**</td>
<td>0.011</td>
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<td>Females</td>
<td>2.22</td>
<td>0.75</td>
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<tr>
<td>Coping HS (individual question):</td>
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<tr>
<td>Effective coping</td>
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<td>Males</td>
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<td>-2.90**</td>
<td>0.005</td>
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<td>Females</td>
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<td>Happiness:</td>
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<td>Factor:</td>
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<td>Physical appearance factor</td>
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<tr>
<td>Males</td>
<td>57.97</td>
<td>48.52</td>
<td>-2.52*</td>
<td>0.014</td>
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<tr>
<td>Females</td>
<td>90.13</td>
<td>65.36</td>
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<td></td>
</tr>
</tbody>
</table>

<sup>a</sup>df=95.

<sup>b</sup>Negative t-values indicate that the second mean is greater than the first.

*Significant at the .05 level.
**Significant at the .01 level.
### Table 19. Continued

<table>
<thead>
<tr>
<th>Components</th>
<th>Mean</th>
<th>S.D.</th>
<th>t-value</th>
<th>df</th>
<th>prob.</th>
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</thead>
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<tr>
<td><strong>AIHS (individual question):</strong></td>
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<tr>
<td>Body shape, size</td>
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<td></td>
</tr>
<tr>
<td>Males</td>
<td>18.15</td>
<td>18.14</td>
<td>-2.54**</td>
<td>0.013</td>
<td></td>
</tr>
<tr>
<td>Females</td>
<td>29.92</td>
<td>23.53</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Satisfied with physical appearance</td>
<td></td>
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</tr>
<tr>
<td>Males</td>
<td>14.09</td>
<td>14.66</td>
<td>-2.29*</td>
<td>0.024</td>
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<tr>
<td>Females</td>
<td>23.57</td>
<td>21.53</td>
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</table>

<table>
<thead>
<tr>
<th>Components</th>
<th>Mean</th>
<th>S.D.</th>
<th>t-value</th>
<th>df</th>
<th>prob.</th>
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</thead>
<tbody>
<tr>
<td><strong>Happiness:</strong></td>
<td></td>
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<td></td>
<td></td>
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<tr>
<td>AIHS (individual question):</td>
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<td></td>
<td></td>
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<tr>
<td>Concerned with physical appearance</td>
<td></td>
<td></td>
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<td></td>
</tr>
<tr>
<td>Males</td>
<td>8.26</td>
<td>12.23</td>
<td>-2.21*</td>
<td>91.34</td>
<td>0.029</td>
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<tr>
<td>Females</td>
<td>15.24</td>
<td>18.68</td>
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</table>

<table>
<thead>
<tr>
<th>Components</th>
<th>Mean</th>
<th>S.D.</th>
<th>t-value</th>
<th>df</th>
<th>prob.</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Humor:</strong></td>
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<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Coping HS (individual question):</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Computer error humor</td>
<td></td>
<td></td>
<td></td>
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<td></td>
</tr>
<tr>
<td>Males</td>
<td>0.12</td>
<td>0.33</td>
<td>-2.13*</td>
<td>89.76</td>
<td>0.036</td>
</tr>
<tr>
<td>Females</td>
<td>0.37</td>
<td>0.81</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

*Have switched from pooled variance estimate to separate variance estimate.*
problems. The least significant differences were telephone with the male mean of 1.97 and the female mean of 2.46 (with a separate variance estimate two-tailed probability of .039) and computer error with the male mean of .12 and the female mean of .37 (with a separate variance estimate two-tailed probability of .036); thus, females were more able to find humor in a late-night phone call than were males, and females were also more able to find humor in a computer error than males were. (The separate variance estimate was used since a significant difference in variation for the two groups was found in the F-test.)

The null hypothesis of no difference was rejected for the values of CAP, and the Situational RHQ instrument of questions concerning the telephone call, romantic evening, the Coping HS instrument of effective coping, the happiness factor of physical appearance, the individual happiness questions of body shape and size, two questions on physical appearance, and the Coping HS question on computer error. All other individual question items showed no significant difference, and the null hypothesis was retained.

Research Question 3E

Are there significant differences between humor, FHx, CAP, happiness, and the variables of exercise groups, hours of exercise, and CAP categories?

Null Hypothesis 6 Among the six exercise groups, the mean scores on humor factors and instruments, FHx factors and components, CAP, and happiness scores are the same.
The independent variable in this one-way analysis of variance was the exercise group, which had six levels. The ten dependent variables were all the following listed components: the humor factors of S Rank H, HW Self, HW Others, the humor instruments of Svebak's HQ, Situational RHQ, Coping HS, and Composite Humor score; the FHx factor of WAF and the item of age; the CAP component of CAP; and the happiness factor of physical appearance. The exercise group one-way analysis of variance results are seen in Table 20.

The Duncan's multiple range test for pairs of means indicates the following means were significantly different at the .05 level. On the dependent humor factor HW Self (from the Natural SH), the evening aerobics group (6.80) was significantly different than the morning swimmers group (9.35) and the morning fitness group (9.38) (means in order of increased size and Duncan underlining principles: 6.80 9.35 9.38). On the dependent variable of age, the evening aerobics group (32.40), the noon aerobics group (35.61), and the morning fitness group (38.60) were significantly different than the evening fitness group (48.17) (means in order of increased size and Duncan underlining principles: 32.40 35.61 38.60 48.17), and the noon aerobics group (35.61) was significantly different from the noon fitness group (46.64) (means in order of increased size: 35.61 46.64). Thus, the evening aerobics group low humor factor HW Self score indicates a lower sense of humor than the morning swimmers group and the morning fitness group. The evening fitness group showed the highest mean age, as compared with the noon aerobics group, the morning fitness
Table 20. One-way analysis of variance of exercise group by selected humor, Fitness History (FHx), cardiorespiratory after pulse (CAP), and happiness components

<table>
<thead>
<tr>
<th>Selected components</th>
<th>Exercise groups</th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Morning fitness</td>
<td>Morning swimmers</td>
<td>Noon aerobics'</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>(n=15)</td>
<td>(n=17)</td>
<td>(n=23)</td>
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<td></td>
</tr>
<tr>
<td></td>
<td>Mean</td>
<td>Mean</td>
<td>Mean</td>
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</tr>
<tr>
<td></td>
<td>S.D.</td>
<td>S.D.</td>
<td>S.D.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Humor:</td>
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<td></td>
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</tr>
<tr>
<td>Factors:</td>
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<td></td>
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<tr>
<td>Self-rank humor</td>
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<td>10.63</td>
<td>10.01</td>
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<tr>
<td>(S Rank H)</td>
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<tr>
<td>Humor with self</td>
<td>9.38*</td>
<td>9.35*</td>
<td>8.72</td>
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<td>(HW Self)</td>
<td>3.40</td>
<td>2.18</td>
<td>2.48</td>
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<td>4.65</td>
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<td>.89</td>
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<td>Instruments:</td>
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<td>Svebak's HQ</td>
<td>42.20</td>
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<td>42.61</td>
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<td></td>
<td>3.41</td>
<td>3.37</td>
<td>3.89</td>
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<td>14.75</td>
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<td>FHx:</td>
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<td>Factor:</td>
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<td>.57</td>
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<td>35.61*</td>
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<tr>
<td></td>
<td>10.85</td>
<td>15.18</td>
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<td></td>
<td></td>
</tr>
<tr>
<td>Happiness:</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Factor:</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Physical appearance factor</td>
<td>74.60</td>
<td>88.35</td>
<td>75.39</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>47.98</td>
<td>73.70</td>
<td>54.58</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

*Means are significantly different from other means in the same selected component.
<table>
<thead>
<tr>
<th>Noon fitness</th>
<th>Evening fitness</th>
<th>Evening aerobics</th>
<th>F-value</th>
<th>F-prob.</th>
</tr>
</thead>
<tbody>
<tr>
<td>(n=14)</td>
<td>(n=23)</td>
<td>(n=5)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Mean</td>
<td>S.D.</td>
<td>Mean</td>
<td>S.D.</td>
<td>Mean</td>
</tr>
<tr>
<td>8.98</td>
<td>1.50</td>
<td>10.22</td>
<td>1.97</td>
<td>10.20</td>
</tr>
<tr>
<td>8.19</td>
<td>2.36</td>
<td>7.21</td>
<td>2.80</td>
<td>6.80*</td>
</tr>
<tr>
<td>3.93</td>
<td>1.14</td>
<td>3.82</td>
<td>1.80</td>
<td>3.87</td>
</tr>
<tr>
<td>40.57</td>
<td>5.27</td>
<td>40.57</td>
<td>5.86</td>
<td>41.40</td>
</tr>
<tr>
<td>31.29</td>
<td>10.27</td>
<td>34.65</td>
<td>9.08</td>
<td>37.00</td>
</tr>
<tr>
<td>19.21</td>
<td>3.12</td>
<td>19.30</td>
<td>3.21</td>
<td>18.00</td>
</tr>
<tr>
<td>151.64</td>
<td>21.64</td>
<td>159.70</td>
<td>23.65</td>
<td>159.20</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>19.21</td>
<td>3.12</td>
<td>19.30</td>
<td>3.21</td>
<td>18.00</td>
</tr>
<tr>
<td>151.64</td>
<td>21.64</td>
<td>159.70</td>
<td>23.65</td>
<td>159.20</td>
</tr>
<tr>
<td>70.29</td>
<td>67.46</td>
<td>79.48</td>
<td>69.18</td>
<td>96.40</td>
</tr>
</tbody>
</table>
group, and the noon fitness group. The second lowest significant mean age
group had the highest HW Self (humor factor) mean score.

The null hypothesis of no significant mean difference was rejected
(the exercise groups were significantly different) for the humor factor of
HW Self and the component of age. The null hypothesis of no significant
mean difference was retained for the humor factors of S Rank H and HW
Others, the humor instruments of Svebak's HQ, Situational RHQ, and Coping
HW, the Composite Humor score, the component of CAP, the FHx factor of
WAF, and the happiness factor of physical appearance.

Null Hypothesis 7 There are no significant differences on select-
ed humor factors and instruments, FHx factors and components, CAP, and
happiness scores when considered by number of hours exercised.

The independent variable in this one-way analysis of variance was
hours of exercise per week. The dependent variables were the humor
factors of S Rank H, HW Self, HW Others, the humor instruments of Svebak's
HQ, Situational RHQ, Coping HS, and the Composite Humor score, the FHx
factors of WAF and HAF and the component of age, CAP, and Composite
Happiness score. The analysis of variance results are shown in Table 21.

The Duncan's multiple range test indicated that the following means
were significantly different at the .05 level. On the dependent variable
CAP, the 6-7-8 hours per week exercisers (92.47) were significantly
different than the 4-5 hours per week exercisers (106.19) and the 1-2-3
hours per week exercisers (107.68) (means in order of increased size:
92.47 106.19 107.68). Thus, the subjects that exercised 6-7-8 hours per
Table 21. One-way analysis of variance of hours of exercise by selected humor, Fitness History (FHx), cardiorespiratory after pulse (CAP), and happiness components

| Selected components | Hours of exercise per week | 1-2-3 Hours (n=47) | Mean | S.D. | 4-5 Hours (n=31) | Mean | S.D. | 6-7-8 Hours (n=19) | Mean | S.D. | F- | F- | ratio | prob. |
|---------------------|---------------------------|--------------------|------|------|-----------------|------|------|--------------------|------|------|----------------|----------------|----------------|-------|-------|
| Humor:              |                           |                    |      |      |                 |      |      |                    |      |      |                |                |                |       |       |
| Factors:            |                           |                    |      |      |                 |      |      |                    |      |      |                |                |                |       |       |
| Self-ranked humor   |                           |                    |      |      |                 |      |      |                    |      |      |                |                |                |       |       |
| (S Rank H)          |                           | 10.15              | 1.43 | 10.00 | 1.99            | 9.78 | 1.73 | .34                | .72  |      |                |                |                |       |       |
| Humor with self     |                           |                    |      |      |                 |      |      |                    |      |      |                |                |                |       |       |
| (HW Self)           |                           | 8.61               | 2.65 | 8.11  | 2.62            | 8.53 | 3.05 | .33                | .72  |      |                |                |                |       |       |
| Humor with others   |                           |                    |      |      |                 |      |      |                    |      |      |                |                |                |       |       |
| (HW Others)         |                           | 4.48               | 1.12 | 3.92  | 1.38            | 4.25 | 1.30 | 1.89               | .16  |      |                |                |                |       |       |
| Instruments:        |                           |                    |      |      |                 |      |      |                    |      |      |                |                |                |       |       |
| Svebak's HQ         |                           | 41.87              | 5.18 | 40.87 | 5.81            | 42.32| 6.23 | .47                | .63  |      |                |                |                |       |       |
| Situational RHQ     |                           | 35.81              | 8.73 | 39.32 | 12.35           | 36.58| 8.95 | 1.17               | .32  |      |                |                |                |       |       |
| Coping HS           |                           | 20.32              | 3.16 | 19.94 | 4.07            | 19.42| 3.47 | .45                | .64  |      |                |                |                |       |       |
| Composite           |                           |                    |      |      |                 |      |      |                    |      |      |                |                |                |       |       |
| Humor score         |                           | 165.09             | 18.75| 164.19| 25.82           | 163.37| 26.07| .04                | .96  |      |                |                |                |       |       |
| FHx:                |                           |                    |      |      |                 |      |      |                    |      |      |                |                |                |       |       |
| Factors:            |                           |                    |      |      |                 |      |      |                    |      |      |                |                |                |       |       |
| Wellness assessment |                           | .52                | .65  | .61   | .45             | .72  | .44  | .93                | .40  |      |                |                |                |       |       |
| factor (WAF)        |                           | .39                | .70  | .24   | .80             | .68  | .53  | 2.31               | .10  |      |                |                |                |       |       |
| Humor assessment    |                           |                    |      |      |                 |      |      |                    |      |      |                |                |                |       |       |
| factor (HAF)        |                           |                    |      |      |                 |      |      |                    |      |      |                |                |                |       |       |
| Component:          |                           |                    |      |      |                 |      |      |                    |      |      |                |                |                |       |       |
| Age                 |                           | 42.89              | 11.90| 42.42 | 15.52           | 37.32| 12.27| 1.28               | .28  |      |                |                |                |       |       |
| CAP:                |                           |                    |      |      |                 |      |      |                    |      |      |                |                |                |       |       |
| CAP                 |                           | 107.68*            | 20.32| 106.19*| 16.66          | 92.47*| 15.72| 4.89               | .009 |      |                |                |                |       |       |
| Happiness:          |                           |                    |      |      |                 |      |      |                    |      |      |                |                |                |       |       |
| Composite           |                           | 365.43             | 248.80| 452.48| 248.42         | 449.00| 227.82| 1.49               | .23  |      |                |                |                |       |       |

*Means are significantly different with at least one other means in the same selected category.
week showed a significantly lower CAP than the subjects that exercised 4-5 or 1-2-3 hours per week.

**Null Hypothesis 8** There are no significant differences on Composite Humor scores and Composite Happiness scores when considered by CAP categories.

The categories of CAP are shown in Table 22. The table displays the six categories for CAP scores which include very poor and poor, below average, average, above average, good, and excellent. These categories for the CAP scores are those taken from the YMCA's table of physical fitness (Appendix J).

In the one-way analysis of variance, the CAP categories were the independent variable, and the Composite Humor and Composite Happiness scores for males and females were the dependent variables. For all subjects, for just the males, and for just the females, the CAP categories were not significantly different (at the .05 level) on either of the dependent variables of Composite Humor scores or Composite Happiness scores.

**Research Question 4**

What selected factors, instruments, components of humor, FHx, CAP, and happiness can predict humor and CAP?

**Null Hypothesis 9** The components of marriage, the FHx factors of WAF and HAF, hours of exercise, children at home, reads comics, feels better with exercise, CAP, gender, age, and the physical appearance factor of happiness do not predict humor.
Table 22. Analysis of variance of cardiorespiratory after pulse (CAP) categories by total humor and happiness scores of total population, males and females

<table>
<thead>
<tr>
<th>Total humor and happiness scores</th>
<th>Very poor &amp; poor</th>
<th>Below average</th>
<th>Average</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>N</td>
<td>Mean</td>
<td>S.D.</td>
</tr>
<tr>
<td>Males and females:</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Composite Humor score</td>
<td>15</td>
<td>164.00</td>
<td>21.94</td>
</tr>
<tr>
<td>Composite Happiness score</td>
<td>15</td>
<td>531.67</td>
<td>277.03</td>
</tr>
<tr>
<td>Males:</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Composite Humor score</td>
<td>4</td>
<td>163.25</td>
<td>31.40</td>
</tr>
<tr>
<td>Composite Happiness score</td>
<td>4</td>
<td>347.00</td>
<td>219.73</td>
</tr>
<tr>
<td>Females:</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Composite Humor score</td>
<td>11</td>
<td>164.27</td>
<td>19.44</td>
</tr>
<tr>
<td>Composite Happiness score</td>
<td>11</td>
<td>598.82</td>
<td>272.69</td>
</tr>
<tr>
<td></td>
<td>Above average</td>
<td>Good</td>
<td>Excellent</td>
</tr>
<tr>
<td>----------</td>
<td>---------------</td>
<td>------</td>
<td>-----------</td>
</tr>
<tr>
<td>N</td>
<td>Mean</td>
<td>S.D.</td>
<td>N</td>
</tr>
<tr>
<td>13</td>
<td>161.08</td>
<td>18.61</td>
<td>31</td>
</tr>
<tr>
<td>13</td>
<td>390.62</td>
<td>270.92</td>
<td>31</td>
</tr>
<tr>
<td>5</td>
<td>159.80</td>
<td>24.50</td>
<td>10</td>
</tr>
<tr>
<td>5</td>
<td>278.20</td>
<td>206.74</td>
<td>10</td>
</tr>
<tr>
<td>8</td>
<td>161.88</td>
<td>15.78</td>
<td>21</td>
</tr>
<tr>
<td>8</td>
<td>460.88</td>
<td>294.51</td>
<td>21</td>
</tr>
</tbody>
</table>
The null hypothesis that the above listed factors and components (selected by previous hypotheses and research questions) contribute to the prediction of humor, was tested using the stepwise multiple regression procedure in SPSSX. On the basis of this analysis, the null hypothesis was rejected at the .01 level of significance for the FHx component of marriage and at the .05 level of significance, and for the FHx component of reads comics at step two of the regression \( F(2,94) = 7.48 \) (Table 23).

The null hypothesis was retained for the FHx factors of WAF and HAF, the FHx components of hours of exercise per week, children at home or not, feeling better with exercise, gender, age, CAP, and the happiness factor of physical appearance. The "best" prediction equation, as indicated in Table 23, was:

\[
\text{Humor} = 164 - 6.74 \text{ Married} + 5.04 \text{ Comics.}
\]

The analysis revealed that if subjects are married, their humor level decreases and if subjects read the comics, their humor level increases. The best predictor of humor was marriage, accounting for 9.8% of the variation. After adding reads comics to the stepwise regression, comics added an additional 3.9% of the variation was explained.

**Null Hypothesis 10** The components of marriage, the FHx factors of WAF and HAF, hours of exercise, children at home, reads comics, feels better with exercise, gender, age, and the physical appearance factor of happiness, do not predict CAP.

The results of this multiple regression are seen in Table 24. The null hypothesis that the above listed components contributed to the
Table 23. Multiple regression of humor on married and reads comics

<table>
<thead>
<tr>
<th>Step</th>
<th>Variable added</th>
<th>Regression coefficient</th>
<th>t-value</th>
<th>Increase in $R^2$ at step of entry</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Married</td>
<td>-6.74</td>
<td>-2.87**</td>
<td>.098</td>
</tr>
<tr>
<td>2</td>
<td>Reads comics</td>
<td>5.04</td>
<td>2.08*</td>
<td>.137</td>
</tr>
</tbody>
</table>

*Significant at the .05 level.
**Significant at the .01 level.

Prediction of CAP was tested using the stepwise multiple regression procedure in SPSSX. On the basis of this analysis, at step five, the null hypothesis was rejected at the .01 level of significance for the components of gender, hours of exercise, and feeling better with exercise ($F(5,91) = 7.60, p<.01$) and at the level of significance of .05 for the FHx factor of WAF and the happiness factor of physical appearance.

The best prediction equation at step five of the stepwise solution, as indicated in the preceding table, was:

$$\text{CAP} = 137.59 + 13.95 \text{ gender} - 2.88 \text{ hours of exercise} - 45.55 \text{ feels better with exercise} - 7.28 \text{ WAF} + .06 \text{ physical appearance}.$$  

The remaining FHx components of marriage, children at home or not, reads comics, and age, and the FHx factor of HAF, did not contribute to the prediction of CAP after the above mentioned five variables were entered into the regression and the null hypothesis was retained.

The analysis revealed that the subjects' CAP was best revealed by gender which accounted for 9.8% of the variation (men had lower CAP than women). Hours of exercise per week accounted for an additional 7.3% of
Table 24. Multiple regression of cardiorespiratory after pulse (CAP) on gender, exercise, feeling better, wellness assessment factor (WAF), and physical appearance factor

<table>
<thead>
<tr>
<th>Step</th>
<th>Variable added</th>
<th>Beta coefficient</th>
<th>t-value</th>
<th>$R^2$ at step of entry</th>
<th>Increase in $R^2$</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Gender</td>
<td>13.95</td>
<td>3.73**</td>
<td>.098</td>
<td>--</td>
</tr>
<tr>
<td>2</td>
<td>Hours of exercise</td>
<td>-2.88</td>
<td>-2.71**</td>
<td>.171</td>
<td>.073</td>
</tr>
<tr>
<td>3</td>
<td>Feeling better with exercise</td>
<td>-45.55</td>
<td>-2.70**</td>
<td>.215</td>
<td>.044</td>
</tr>
<tr>
<td>4</td>
<td>WAF factor</td>
<td>-7.28</td>
<td>-2.31*</td>
<td>.256</td>
<td>.041</td>
</tr>
<tr>
<td>5</td>
<td>Physical appearance factor</td>
<td>.06</td>
<td>2.21*</td>
<td>.294</td>
<td>.038</td>
</tr>
</tbody>
</table>

*Significant at the .05 level.
**Significant at the .01 level.

Variation. Feeling better with exercise accounted for an additional 4.4% of variation (thus, responding positively to the question, "I feel better when I exercise" resulted in a decrease in the subjects' CAP). WAF (FHx factor) accounted for another additional 4.1% of variation, and physical appearance (happiness factor) accounted for an additional 3.8% of variation.

Summary

This study examined the following four research questions: 1) Are there subcomponents (factors) of the Natural Setting Humor (Natural SH)
instrument? 2) Are there subcomponents (factors) of the Fitness History (FHX) instrument? 3A) How reliable (consistent) are the responses to humor and FHX? 3B) Are there significant relationships within the variables assessing humor, FHX, CAP, and happiness? 3C) Are there significant relationships across the variables humor, FHX, and happiness? 3D) Are there significant differences between humor, FHX, CAP, happiness, and the variables of marriage, children, gender, and individual questions?) 3E) Are there significant differences between humor, FHX, CAP, happiness, and the variables of exercise groups, hours of exercise, and CAP categories? and 4) What selected factors, instruments, components of humor, FHX, CAP, and happiness can predict humor and CAP? These four research questions and subsequent ten null hypotheses are summarized in the following paragraphs.

The first two research questions examined the Natural SH and FHX instruments, as those were the instruments designed by the researcher. The factor analysis of the Natural SH instrument resulted in three factors and the factor analysis of the FHX instrument resulted in two factors. Thus, the first two research questions were answered affirmatively, as there were subcomponents found in both the Natural SH and FHX instruments.

Research Questions 1 and 2 were examined by the rotated factor correlation matrices and mean inter-item correlations (Table 4-11). The reliabilities of the Natural SH and FHX factors were calculated by determining the alpha coefficients. The mean inter-item correlations (Table 11) of the Natural SH and FHX factors indicated alpha coefficients ranging from .53 to .82. The lowest mean inter-item correlation was found
in the factors of the Natural SH instrument (including the humor factors of S Rank H (.36), HW Self (.35), and HW Others (.37)), and the highest mean inter-item correlations were found in the factors of the FHx instrument (the WAF (.42) and HAF (.70)). Thus, the correlation among the WAF and HAF indicated greater correlation among the FHx factors than the correlation among the Natural SH factors, and answered the third research question concerning the degree of reliability and correlation. The higher correlation among the FHx factors of WAF and HAF indicated they both measured similar ideas—the questions in WAF were about physical wellness, mental wellness, and exercise and the questions in HAF were about humor and laughter; thus, these factors measured somewhat similar or correlated components. The lower correlation (moderate correlation) among the Natural SH factors indicated that the factors in the Natural SH measured somewhat different ideas; thus, the Natural SH factors measured more varied concepts of humor.

Research Questions 3A, 3B, and 3C were examined by other correlation matrices which determined the significant correlations within and across the selected items, instruments, and components of humor, FHx, CAP, and happiness (Tables 12-16). The first null hypothesis was rejected, as several significant correlations were shown across the factors and components of humor, FHx, and happiness. The significant correlations are discussed in the following paragraphs.

The high correlations for humor components of S Rank H, Svebak's HQ, Situational RHQ, Coping HS, and Natural SH (Table 12) were found with the Composite Humor score (.70, .68, .82, .72, .70, respectively), which
indicated that several of the components show very strong relationship with the Composite Humor score. Thus, the total score on the Natural SH instrument and the S Rank H factor (which the researcher compiled) do, in fact, correlate highly with the subjects' total humor (Composite Humor score). Coping HS correlated with Svebak's HQ (.50) and Situational RHQ (.51), which indicated a strong correlation among these three additional humor instruments (designed by previous researchers); thus, these humor instruments indicated strong consistency when measuring the concept of humor. The Natural SH factors of HW Self (.28) and HW Others (.27) were moderately correlated with each other and not as highly correlated with the Composite Humor score as the components; thus, they were not as consistent when measuring the concept of humor, and this indicates that the factors may be measuring different concepts or aspects of humor.

The correlations among the FHx and CAP (Table 13) components indicated that men in this study have a lower CAP on average as compared with women (.31). (Since Table 13 also indicates the demographic data that men were older on average than women (.28), it is to be noted that older men subjects had a lower CAP on average than the younger women subjects.)

The highest happiness correlations (Table 14) were found among four of the five happiness factors with the Composite Happiness--physical appearance (.64), desire for learning (.74), social relationships (.72), and assisting others (.64). These very strong correlations indicated a high degree of consistency and correlation among these factors for the measurement of happiness; thus, these happiness factors measured, somewhat, the same aspects of happiness. The one remaining happiness factor
of goal striving indicated negative correlations with the other happiness factors, which indicated that as goal striving happiness increases, overall happiness decreases; thus, the subjects who were high in the goal striving factor were generally not as happy as those who were low in goal striving. The construct validity of these happiness factors was indicated in the inter-item correlation matrices.

Other significant correlations (Table 15) among the humor, FHx, CAP, and happiness components indicated that older subjects had lower scores on the humor instruments of Situational RHQ (-.36) and Svebak's HQ (-.21), and on the Composite Humor score (-.31), and lower scores on the humor factor of HW Others (-.17). Married subjects indicated lower scores on the humor instruments of Coping HS (-.21) and Svebak's HQ (-.18), and on the Composite Humor score (-.31). Thus, both older and married subjects showed lower humor scores on the previously listed humor instruments and factors than younger subjects. The subjects who were younger in age showed increased scores on the HAF (factor of FHx) (-.36) and on the assisting others happiness factor. Once again, the younger subjects indicated greater humor than the older subjects, with the higher HAF score. Since the younger subjects also scored higher on the happiness factor of assisting others, they indicated less emphasis on assisting others, in order to be happy. Thus, older subjects were more likely to believe that assisting others was essential to their happiness than the younger subjects believed.

The second null hypothesis was: There are no significant differences between married and not married participants on the humor, FHx, CAP, and
happiness scores. This second null hypothesis was rejected, as significant differences were found between married and not married subjects on three of the ten factors, instruments, and components selected and tested. T-tests (Table 17) indicated that not married subjects showed significant mean differences on the humor instruments of Situational RHQ and Coping HS, and on the Composite Humor score. Married subjects showed less humor on the above listed humor instruments and Composite Humor score. The null hypothesis of no significant difference was retained for the humor instrument of Svebak HQ, the humor factors of S Rank H, HW Self, and HW Others, the FHx factor of WAF, CAP, and the happiness factor of physical appearance.

The third null hypothesis was: There are no significant differences between those participants who have children at home and those who do not, on the humor, FHx, CAP, and happiness scores. This null hypothesis was retained, as no significant mean differences were found between the subjects with/without children at home and the selected ten various humor, FHx, CAP, and happiness factors, instruments, and components.

The fourth null hypothesis was: There are no significant differences between men and women participants on the humor, FHx, CAP, and happiness scores. The fourth null hypothesis was rejected because t-tests indicated significant mean differences between men and women on four of ten selected humor, FHx, CAP, and happiness factors, instruments, and components selected and tested. The significant mean differences were found between men and women on the Coping HS (humor instrument), the WAF (factor of the FHx), CAP, and the physical appearance factor of happiness. Men indicated
a lower score on the Coping HS, the WAF, and the CAP than the women; thus, men showed less humor on the Coping HS and the WAF, along with a lower CAP than the women. Men also indicated a higher degree of happiness on the factor of physical appearance than the women; thus, the men indicated more happiness with their physical appearance than the women did. Significant mean differences were not found on the humor instruments of Svebak's HQ, Situational RHQ, the Composite Humor score, and the Natural SH humor factors of S Rank H, HW Self, and HW Other, so the fourth null hypothesis of no significant mean difference was retained for these humor factors, instruments, and Composite Humor score.

The fifth null hypothesis was: There are no significant differences between men and women participants on individual question scores on the humor, FHx, CAP, and happiness scores. The fifth null hypothesis was rejected because t-tests (Table 19) indicated significant mean differences for men and women on nine of the 31 individual questions selected. Significant mean differences were found on the individual questions of CAP, telephone call at night, romantic evening with friend, effective coping, physical appearance, body shape and size, satisfied with physical appearance, concerned with physical appearance, and computer error/humor. Pooled variance estimates indicated that men had a significantly lower CAP than women, and that women demonstrated significantly higher means (more humor) in the individual questions of telephone call at night, romantic evening with friend/humor, effective coping, and a higher mean score in physical appearance, body shape and size, and satisfied with physical appearance (this higher happiness score indicates less happiness in the
factor of physical appearance), than men did. Separate variance estimates indicated that women had higher mean scores in the physical appearance individual question of concerned with physical appearance (which indicated less happiness in this area) and Coping HS (which indicates more humor in this area) than men did. The fifth null hypothesis of no significant difference was retained for the remaining 22 individual questions.

One-way analyses of variance were used to examine the difference between exercise groups (Null Hypothesis 6), hours per week exercised (Null Hypothesis 7), and categories of CAP (Null Hypothesis 8). The sixth null hypothesis was: Among the six exercise groups, the mean scores on humor factors and instruments, FHx factors and components, CAP, and happiness scores are the same. The sixth null hypothesis was rejected as the analysis of variance indicated significant mean differences among the six exercise groups and the number of hours exercised per week in two of the 11 selected components of humor, FHx, CAP, and happiness. The first one-way analysis of variance was calculated for the six exercise groups of morning fitness, morning swimmers, noon aerobics, noon fitness, evening fitness, and evening aerobics and 11 selected humor, FHx, CAP, and happiness components. On the dependent humor factor of HW Self (from the Natural SH), the evening aerobics group was significantly different (higher) than the morning swimmers group and the morning fitness group; thus, the evening aerobics groups showed greater humor on the Natural SH factor of HW Self than the morning fitness group. On the dependent component of age, the evening aerobics group, the noon aerobics group, and the morning fitness groups were significantly different (lower) than the
evening fitness group; thus, the evening fitness group participants were older than the other three listed exercise groups. The null hypothesis was retained for the remaining nine components of humor factors of S Rank H, HW Others, the humor instruments of Svebak's HQ, Situational RHQ, and Coping HS, the Composite Humor score, the FHx factor of WAF, CAP, and the happiness factor of physical appearance.

The seventh null hypothesis was: There are no significant differences on selected humor factors and instruments, FHx factors and components, CAP, and happiness scores when considered by number of hours exercised. The second one-way analysis of variance was calculated on the hours of exercise per week and 12 selected humor, FHx, CAP, and happiness components. The hours of exercise per week were grouped into three categories: 1) 1-2-3, 2) 4-5, and 3) 6-7-8 hours per week. The seventh null hypothesis for hours of exercise per week was rejected on the dependent variable of CAP because the 6-7-8 hours per week exercisers were significantly different (lower) than the 4-5 and 1-2-3 hours per week exercisers; thus, the 6-7-8 hours per week exercisers had lower CAP than the other exercisers. The seventh null hypothesis of no significant mean difference among the hours of exercises per week categories, was retained for the remaining 11 components, including the humor factors of S Rank H, HW Self, and HW Others, the humor instruments of Svebak's HQ, Situational RHQ, and Coping HS, the Composite Humor score, the FHx factors of WAF and HAF, age, and the Composite Happiness score.

The eighth null hypothesis was: There are no significant differences on Composite Humor scores and Composite Happiness scores when considered
by CAP categories. The third one-way analysis of variance was calculated on the dependent variable of CAP categories and the Composite Humor and Composite Happiness scores. The six categories of CAP included very poor and poor, below average, average, above average, good, and excellent. No significant differences were found in the categories of CAP and the Composite Humor and Composite Happiness scores, so the eighth null hypothesis of no significant difference between Composite Humor and Happiness scores and CAP was retained for males, females, and males and females combined.

Multiple regression examined Research Question 4 and the ninth and tenth null hypotheses which determined the prediction values of humor and CAP. The ninth null hypothesis was: The components of marriage, the FHx factors of WAF and HAF, hours of exercise, children at home, reads comics, feels better with exercise, CAP, gender, age, and the physical appearance factor of happiness do not predict humor. The ninth null hypothesis of no significant prediction value of humor was rejected for two of the 11 components selected. Multiple regression indicated that the FHx components of marriage and reads comics showed significant prediction value. The best predictor of humor was marriage, as it accounted for 9.8% of the variation and revealed that married subjects show less humor than non-married subjects. Reads comics added an additional 3.9% of variation, which revealed that subjects who read the comics are more humorous than subjects who do not read the comics. The ninth null hypothesis of no significant humor prediction value of the FHx factors of WAF and HAF, the FHx components of hours of exercise per week, children at home or not,
feeling better with exercise, gender, age, the CAP, and the happiness factor of physical appearance was retained.

The tenth null hypothesis was: The components of marriage, the FHx factors of WAF and HAF, hours of exercise, children at home, reads comics, feels better with exercise, gender, age, and the physical appearance factor of happiness, do not predict CAP. The tenth null hypothesis of no prediction value of CAP was rejected for five of the ten components: the FHx components of gender, hours of exercise, feeling better with exercise, the WAF factor of FHx, and the happiness factor of physical appearance indicated significant prediction value for CAP. The best predictor of CAP was gender which accounted for 9.8% of variation and indicated that men subjects were better predictors of lower CAP than women. The second best predictor of CAP was hours of exercise which accounted for an additional 7.3% of the variation and revealed that as the hours of exercise per week increased, the subjects' CAP was lower. Feeling better with exercise accounted for an additional 4.4% of variation and revealed that if the subjects "felt better with exercise," their CAP scores were lower. The WAF factor of FHx accounted for an additional 4.1% of variation and revealed that the higher the subjects' WAF score, the lower their CAP. Finally, physical appearance accounted for an additional 3.8% of variation and revealed that the higher the physical appearance score, the less happy the subjects are with their physical appearance, the higher their CAP score. (Women had higher CAP scores, and also had higher, or more unhappy physical appearance scores.) The tenth null hypothesis of no CAP
prediction value was retained for the FHx components of marriage, children at home or not, reads comics, and age, and for the HAF factor of FHx.
CHAPTER V. SUMMARY AND DISCUSSION

The purpose of this study was to examine four wellness concepts of humor, Fitness History (FHx), cardiorespiratory after pulse (CAP), and happiness. The research in this study involved various statistical analyses of the data collected.

The data in this research were collected from a total sample of 98 subjects from the University exercise clinic population and analyzed by using several methods: descriptive statistics, factor analyses, correlations (inter-item correlations and significant correlations), t-tests, analyses of variance, and multiple regression. The results of this data are summarized and discussed in further detail in the following paragraphs. The final sections of this chapter include limitations of the study and recommendations for further study.

Summary

The subjects, instrumentation, and findings from the data and research are discussed in the following paragraphs.

Subjects

The subjects in this study were Iowa State University (ISU) employees or students who had enrolled in the ISU exercise clinic classes for the Spring, 1991 semester. The 98 subjects were participants in six exercise groups meeting two to three times per week. The 98 subjects included 34 females and 64 males. The mean age of the subjects was 42. Men were
older, on average, than the females. One subject was not available for more than the first humor instrument (Natural SH).

Instrumentation

Instrumentation was used to assess humor, FHx, CAP, and happiness. There were four humor instruments, one FHx instrument, one CAP assessment, and one happiness instrument. The four humor instruments included the Natural Setting Humor (Natural SH) instrument (Bartels, 1991), Svebak’s Humor Questionnaire (Svebak’s HQ) (Svebak, 1974a), the Situational Response Humor Questionnaire (Situational RHQ) (Lefcourt & Martin, 1986), and the Coping Humor Scale (Coping HS) (Lefcourt & Martin, 1986). The Fitness History instrument included the FHx (Bartels, 1991). The cardio-respiratory after pulse (CAP) was assessed by the Kasch Bench Step test (Kasch & Boyer, 1968), and the happiness instrument was the Actual and Ideal Happiness Scale (AIHS) (Taylor, 1988).

Findings

A factor analysis revealed three factors for the Natural SH instrument: the S Rank H (Self-rank humor), the HW Self (humor with self), and the HW Others (humor with others), and two factors for the FHx instrument: the WAF (wellness assessment factor) and the HAF (humor assessment factor).

Factor reliability and correlation matrices were used to produce alpha coefficients. The alpha coefficients, for the factors, ranged from .53 to .82, in which the highest mean inter-item correlations (greater
reliability) were among the WAF (.42) and HAF (.70) factors of the FHx instrument. The alpha coefficient for WAF was .75 and for HAF was .82. The correlation matrices also indicated significant correlation among several humor, FHx, CAP, and happiness components. Among the humor components, the highest correlation was found between the Natural SH instrument and the Composite Humor score (.70). Higher reliable correlations were also shown between the Coping HS and both the Situational RHQ (.51) and Svebak's HQ (.50).

Among the happiness factors, the four factors that showed high correlations with the Composite Happiness score were the factors of physical appearance (.64), desire for learning (.74), social relationships (.72), and assisting others (.64). The final factor of happiness, that of goal striving, indicated negative correlation with the other factors of happiness and with the Composite Happiness score; this indicates that the subjects who highly value the factor of goal striving to be happy, indicate lower Composite Happiness scores.

Significant mean differences with the t-tests were found between the married, not married, men, and women subjects. The not married subjects indicated significantly lower mean differences on the humor instruments of Situational RHQ and Coping HS, and the Composite Humor score. Men and women indicated significant mean differences in the t-tests on various humor, FHx, CAP, and happiness components. Men had a lower mean score on the Coping HS, the WAF, and the CAP than did women. Men had a lower mean score on the physical appearance factor of the happiness scale; thus, men were happier with their physical appearance than were women. Significant
mean differences were found on the t-tests for men and women on individual questions of the humor instruments. Significant mean differences were not found between the subjects with/without children at home and various humor, FHx, CAP, and happiness components.

The analyses of variance presented significant mean differences among the six exercise groups and the number of hours exercised per week with the components of humor, FHx, CAP, and happiness. The exercise group means differed on the HW Self factor of the Natural SH instrument and on age. No significant mean differences were found in the Composite Humor and Composite Happiness scores and the component of CAP.

The multiple regression results indicated that the best predictors of humor were the FHx components of marriage and reads comics. The best predictors of CAP were the FHx components of gender, hours of exercise, and feeling better with exercise, WAF (FHx factor), and the last entering predictor of CAP was happiness index factor of physical appearance.

Discussion

Research interest in the study of humor and FHx has been growing steadily since the middle part of this century. Research interest in wellness is a more recent topic extending from the 1960s.

Wellness is a holistic idea, based on many and varied wellness concepts. The use of gentle compassion and taking oneself lightly during wellness training was encouraged by Travis and Ryan (1988). The wellness areas of social, fitness, physiological, and emotional wellness are exemplified by the concepts of humor, FHx, CAP, and happiness. Humor,
FHx, CAP, and happiness are concepts of a "well" person. Humor is a highly valued personality trait in American society (Treadwell, 1970) and it serves as a "social lubricant" (Moody, 1978). Thus, humor is used in psychotherapy by helping the clients know they can take their trouble more lightly than they are doing (Adler, 1964b).

The subjects in this study indicated high FHx scores (Table 1). Over two-thirds of the subjects stated they were more fit today than three years ago in the areas of physically well, exercise, mentally well, like to exercise, humorous, and laughter. Fifty-five of the 97 subjects stated they had less stress today than three years ago; 34 of the 97 subjects stated they had more stress today than three years ago; and 8 of the 97 subjects stated they had the same amount of stress today as three years ago. Since the subjects were exercisers, as exhibited by their attendance of regular exercise sessions during this research, perhaps the idea that exercise reduces stress is indicated by the FHx results previously listed. In Kobasa's (1979) hardiness study, he defines the commitment component of hardiness (as in this example, commitment to exercise) as being a factor in viewing stress as a challenge and potential for growth, rather than as something persons have no control over. Ardell (1977), Travis & Ryan (1988), and Selye (as cited by Prentice, 1991) discuss the value of stress reduction techniques, with exercise being one of these. Ardell (1977) talks of "getting lost" in a calming activity and to remember "that exercise is fun" to help manage the stress in persons' lives. Lefcourt and Martin (1986) use the Coping HS (humor instrument) to test the ability of people to use humor to reduce the stress in their lives.
Two of the lifestyle components of the FHx included children at home or not, and marriage. No significant differences were found between those subjects with/without children at home and various humor, FHx, CAP, and happiness components. On the other hand, married subjects did have significantly different scores on various components than not married subjects did (Tables 17, 18a, 19). Married subjects indicated lower humor scores on the humor instruments of Situational RHQ and Coping HS (Table 17) and on the Composite Humor score than the not married subjects.

Significant correlations indicated that older subjects indicated lower Situational RHQ humor scores (Table 15), lower scores on the FHx factors of WAF and HAF, and lower scores on the FHx components of hours of exercise per week, reads comics, and feeling better with exercise (Table 16). These results indicate that older subjects do not exhibit as much FHx wellness or humor, as many hours of exercise per week, they do not read the comics as much, and they do not feel better with exercise as much as younger subjects do.

Gender differences are shown in Table 18a. Men showed lower scores on the humor instrument of Coping HS, the FHx factor of WAF, and the CAP. This first indicates that men do not use humor as well as women do when it comes to coping with everyday problems. This relates to Brody's (1950) idea that laughter helps persons to express their aggression in a socially accepted way and LeShan's belief that humor helps us to endure life's problems. Lefcourt and Martin (1986) devised the humor instrument, Coping HS, to assess the degree that humor is used to cope with the stressful events of life. As men scored significantly lower than women on the
Coping HS, they also scored lower on the individual question, effective coping, from the Coping HS. With the daily stress that people are under, this result may indicate that men may need to learn to use more effective methods of coping with stress. Secondly, the fact that men scored significantly lower on their WAF (FHx factor) indicates that men scored lower on the FHx questions (Appendix G) of "I am more physically well today than three years ago," "I get more exercise today than I did three years ago," "I am more mentally well today than I was three years ago," and "I like to exercise more today than I did three years ago" (as these are the individual questions that make up the WAF factor of the FHx). Thus, men generally have a "less well" attitude in these areas than women do. Yet, men's physical appearance happiness scores indicate that men are happier than women with their physical appearance; men also have lower CAP scores than women. Thirdly, these findings indicate that the more physically well subjects (those with a lower CAP score) are also more happy with their physical appearance, which is indicated by more men than women (Table 18a). Since Taylor (1988) indicates that physical appearance is one of the five factors that indicates happiness, it is interesting to note this discrepancy between men and women. CAP, as an indicator of cardiorespiratory endurance, as cited by Anspaugh et al. (1991), is the most important component of physical wellness and the foundation for the development of total fitness (p. 141). Astrand and Rodahl (1970), Wilmore (1982), and Pollock et al. (1978) also stress the importance of CAP as an indicator of physical wellness. So these results indicate that the men subjects are more physically well than the women subjects. It needs to be noted that
women, on average, are expected to have somewhat higher CAP rates than men as presented in "Y's Way to Total Fitness" table in Appendix J. The researcher's study concurred that men do have lower CAP rates than do women.

Gender differences are also found in the individual questions of the humor instruments (Table 19). Women indicated greater humor on the individual humor questions of telephone call/middle of the night, romantic evening with friend, computer error, and effective coping; whereas, males scored significantly lower in these areas of humor. Thus, males do not seem to use humor in these areas of Situational RHQ humor and Coping HS humor. There were no individual questions on these humor instruments in which men scored significantly higher. This tends to indicate that women use their humor to help them cope with selected everyday problems and situations more than men do. On the individual happiness questions concerning physical appearance, men indicate significantly greater happiness than do women. Thus, this study appears to support the pervasive opinion that women are not easily satisfied with their physical appearance.

Older subjects also indicated less happiness in the factors of assisting others and physical appearance, in the Composite Happiness score, and are happier in the factor of goal striving, than the younger subjects (Table 16). So it can be surmised that older subjects are less happy than younger subjects, except in the happiness factor area of goal striving. Does this mean that older subjects are more goal-oriented than younger subjects, and does this also mean that those that are more goal-
oriented are also less happy in their assisting others, physical appearance, and in Composite Happiness score? Does goal striving get in people's way of taking time to take care of themselves physically or in taking time to assist others? If people are goal-oriented, do they not take the time to be happy (as in showing a lower Composite Happiness score)? Taylor (1988) says that goal striving is one of the five factors found in her happiness scale (AIHS), but her study on happiness was done with college-age students, who were not as old as many subjects in this study (mean age of subjects was 42). This finding may indicate that as people become older, goal striving becomes more important. Fellows (1966) includes goal setting as a concept in his happiness study. Success in a person's occupation or related meaningful activity was also related as an important happiness concept (Flügel, 1925; Iisager, 1948). So if older subjects value goal striving as an important happiness concept, why are they not particularly happy?

The research indicated only two significant differences among the six exercise groups. The evening aerobics group scored lower on the Natural SH factor of HW Self than the morning swimmers group or the morning fitness group. The evening fitness group showed a significantly higher age score than did the evening aerobics group, the noon aerobics group, and the morning fitness group; thus, older subjects tended to exercise later in the day than younger subjects. This could be a good indicator as when to schedule exercise classes for older and younger people.

The FHx component of hours of exercise per week indicated significant difference, with the 6-7-8 hours per week exercisers' CAP being
significantly lower than the 4-5 and 1-2-3 hours per week exercisers. It appears that those who exercise 6 or more hours per week are more physically well (lower CAP) than those who exercise 5 or less hours per week. Pollock et al. (1984) discussed the use of exercise for improving cardiorespiratory fitness. Persons with a lower CAP are in better physical condition than those with a higher CAP (Baumgartner & Jackson, 1975; Kurucz et al., 1969; and Katch & McArdle, 1983).

No significant difference was found between the categories of CAP (very poor and poor, below average, average, above average, good, and excellent) and the Composite Humor and Composite Happiness scores. Thus, this study does not indicate that the subjects' humor or happiness levels increase or decrease, according to their categories of CAP, or according to their physical wellness.

The best predictor of humor was marriage, which indicates that married subjects tend to be less humorous than not married subjects. The second best predictor of humor was reads comics, which indicates that the subjects who take the time to read the comics tend to be more humorous people than those who do not read the comics. Basically, this study indicates that those who take the time to experience humor (as in reading the comics) are more humorous than those who do not take the time. The use of comics, cartoons, and jokes for evaluating humor was a common phenomenon (Redlich et al., 1951; Eysenck, 1943; and Roback, 1939). Babad (1974) discussed the passive and reproducer role of reading comics and being appreciators of humor.
The best predictor for CAP was gender, as men tended to have lower CAP than did women. Golding et al. (1982) point out the higher expected CAP rates for women than men in their "Y's Ways to Total Fitness" table and manual. The second best predictor of CAP was the FHx component of hours of exercise per week; thus, the more hours per week the subjects exercised, the lower their CAP was. So exercise does pay off when it comes to working for a lower CAP (as cited by researchers in previous paragraphs)--those who exercise more are more physically well (according to CAP). Other predictors of CAP were the FHx component of feeling better with exercise, the WAF (FHx factor), and the happiness index factor of physical appearance. The feeling better with exercise is an interesting concept when considering humor, FHx, CAP, and happiness components.

Almost all of the subjects (in fact, 96 of 97 subjects, or 98%) said they feel better when they exercise. This seems to be a very important and common feeling among exercisers. Even if the subjects have not reached the fitness goals they wanted to attain during this exercise clinic (if they have not lowered their CAP, for example), they stated that they feel better because they are at least exercising or working on their goals.

One subject said, "I still have not accomplished my weight loss goal, but it doesn't bother me nearly as much as long as I keep exercising."

This is the kind of attitude the researcher usually found among the exercising subjects—they were all working together to reach their fitness or health goals. They exhibited a kind of camaraderie of working together. The happiness index factor of physical appearance, once again, indicates that the more unhappy subjects are with their physical
appearance, the higher their CAP is; thus, those unhappy with their physical appearance are also less physically well (according to CAP) than those who are happy with their physical appearance.

In summary, approximately two-thirds of the subjects in this study felt more fit today than they did three years ago. Married subjects indicated less humor than not married subjects, and having children at home was not a significant component in the concepts studied. Older subjects indicated less humor than younger subjects and women indicated greater humor in everyday situations and when coping with stress than men did. Men scored "less well" on the FHx than women did, and men were much happier with their physical appearance than women were. Men had lower CAP rates than women did and the subjects that exercised more than 6 hours per week indicated a lower CAP than those subjects who exercised fewer than 6 hours per week. The subjects in this study did not show a significant difference in their Composite Humor or Composite Happiness scores according to their CAP categories. Humor was best predicted by marriage and reading comics, as it was found that not married subjects who read the comics were more humorous than the married subjects who did not read the comics. Gender was the best predictor of CAP (as mean had lower CAP than women), and 6 or more hours per week predicted a lower CAP. Feeling better with exercise influenced CAP, as did the WAF (FHx factor), and the physical appearance happiness index factor. The higher the subjects' WAF, the lower their CAP, and once again, the higher the subjects' happiness with physical appearance, the lower their CAP.
Limitations of the Study

This research was limited to the exercisers of the exercise clinic groups regularly scheduled on the ISU campus. These subjects were already attempting to be exercisers, in general; they had chosen an exercise routine by voluntarily signing up for the exercise clinic. They were 18 years old and above, with a mean age of 42. The support quality found in an exercise clinic could be compared with the support quality found in other self-help groups. The researcher suggests this study be conducted with other subjects of varying ages and situations. Perhaps self-help groups could be evaluated for the concepts of humor, FHx, CAP, and happiness; the self-help groups suggested could be weight watchers, co-dependents, or Al-Anon members. It would be enlightening to see how these various groups respond to the concepts in this study. Data collected on samples in varying locations and with varying backgrounds would allow for greater generalizability of the results found, since the subjects in this study represented a captive audience from a college campus in a rural metropolitan area. We cannot generalize the results found from the subjects in just this exercise clinic to all other exercisers, in general.

Since this study included subjects of 18 years of age and older, it would be interesting to study younger subjects and their wellness needs. Various humor, FHx, CAP, and happiness assessments for younger subjects could be devised to assess the different exercise and fitness needs for children.

In this study, humor was assessed by many methods, found within four humor instruments. Happiness was assessed by several factors within one
happiness instrument. Fitness was assessed with only one FHx instrument of 13 questions, as was physiological wellness with only the CAP, taken from the Kasch Bench Step Test (Kasch & Boyer, 1968). Both the fitness and physiological assessments could be more extensive to enable the researcher more depth and breadth when evaluating these wellness concepts.

Three of the humor instruments, the one FHx instrument, and the one happiness instrument were based on the subjects' self-reports. This information collected was then limited to the extent of the subjects' self-understanding and willingness to share this information in an honest fashion.

One final thing to consider with this study was the fact that a few of the subjects were of minority status; perhaps these subjects' humor, FHx, CAP, and happiness results were different, based on the fact that they did not have the same Caucasian background as the majority of the subjects did. Upon reflection from the researcher, the humor, FHx, CAP, and happiness instruments may have shown bias toward the Caucasian majority culture. Further research needs to take ethnic and cultural differences into consideration.

In summary, the limitations of this study were the limited age and status of the exercise group, the limited FHx and CAP evaluations, the self-report of the subjects, and the possible ethnic majority bias of the instruments used.
Suggestions for Further Research

The following ideas are suggestions for the future research on the wellness concepts of humor, FHx, CAP, and happiness.

1. One suggestion for further research would be to assess subjects, in greater detail and depth, for FHx. Areas suggested for further FHx assessment include stress, Type A/B behavior, eating/nutrition habits, working/occupation, and exercise patterns outside of the regularly scheduled clinic sessions.

2. The area of Type A/B behavior would make an interesting future study with humor, FHx, CAP, and happiness. The researcher found that several subjects felt that they did not "have time" for humor, jokes, cartoons, etc. Since Type A behavior describes people with a sense of "time urgency" (Steptoe & Mathews, 1984), it would be interesting to see how Type A people compare with Type B people in humor, FHx, CAP, and happiness. In fact, the researcher would hypothesize that Type A people have fewer positive humor, FHx, CAP, and happiness characteristics than do Type B people.

3. In this study, the subjects were assessed for physiological wellness by measuring their CAP with a bench step test only (Kasch & Boyer, 1968). A suggestion for further research would be to assess subjects for physical wellness with a more detailed assessment, perhaps a submaximal cycle test which assesses cardiorespiratory (CAP) in greater depth. This type of physical assessment would allow the researcher to correlate various types of physical qualities with the variables of humor, FHx, CAP, and happiness.
One physical fitness measurement that was not used in the researcher's study was that of subject body weight. The need for assessing the subjects' body weight was indicated in this study's results of women's unhappiness with their physical appearance. Not only would it have been interesting to correlate body weight with humor, FHx, CAP, and happiness, but also with physical wellness and fitness alone, since body weight has much to do with determining one's physical wellness.

4. A few subjects mentioned the fact that they didn't like Peanuts cartoons and requested the desire for other types of cartoons to be used in the humor instruments. The researcher did use several types of jokes and cartoons in this study, yet a larger variety of jokes and cartoons could be investigated. Ethnic, career, etc. bias in humor examples would be a possible bias to be aware of in future research.

5. The researcher in this study is female. A suggestion for further research would be to use both a female and male to interact with the subjects. This would help to prevent any possible sex bias between the researcher and the subjects.

6. This study was based on the observation, interaction, and written appraisal of 98 subjects. A suggestion for further research would be to include a greater number of subjects, of varying ages and groups, to assess the present humor, FHx, CAP, and happiness concepts. It would be interesting to study the concepts in this study with more available subjects and their gender (male to male; female to male), children, and age differences.
7. One area the researcher eliminated from the compiled Natural SH instrument was that of calling the subject's best friend and asking he/she to rate the subject's humor on a scale from 1 to 5. The researcher did not tabulate the results from this question because it was very difficult to contact all of the subjects' best friends, as out-of-town phone numbers were given and several of the phone numbers given were illegible. The researcher still feels that this method of measuring one's humor is an important way to assess humor. In future research, it would be worth including this contact with, and the evaluation from, the subject's best friend. In order to include the best friend's evaluation of the subject's humor, it is suggested to explain the parameters of phone numbers when asking for them; such as no out-of-town phone numbers, please write legibly, please tell the hours that are best to call this friend, or perhaps tell the friend to call the researcher with his/her humor rating of the subject.
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This dissertation is dedicated to my two daughters, Erin Katie and Anna Leah Maggie, who have stood by me throughout the ups and downs of graduate school, university housing, the many hours Mom spent on the computer, for our comic relief traveling/camping trips, and for their immeasurable contribution to my life, in general.

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APPENDIX A.

ARDELL WELLNESS WHEELS
The Five Dimensions of High Level Wellness

A Realignment of the Five Dimensions

Self-Responsibility and Medical Self-Care

Nutrition and Fitness

Norms or Rules

Ethics Values Purposes

Stress Management and Boredom Immunity

DIMENSIONS OF WELLNESS

APPENDIX B.

TRAVIS AND RYAN WELLNESS WHEEL
APPENDIX C.

NATURAL SETTING HUMOR INSTRUMENT
1. Please rate these cartoons as to how humorous they are. (Please rate them on a scale of 1 to 3 with 1 being "not humorous", 2 being "moderately humorous", and 3 being "very humorous". Please put a check beside the correct response.)


1. WHAT'S THIS? THAT LITTLE RED-HAIRED GIRL DROPPED HER PENCIL.
2. SEE...IT'S GOT TEETH MARKS ALL OVER IT...
3. SHE NIBBLES ON HER PENCIL... SHE'S HUMAN!


1. WHAT'S THE WORLD IS THAT?
2. THAT'S A FIREFLY
3. I THOUGHT IT WAS AN Usher!


1. YOU'VE NEVER GONE FISHING? WELL, COME ON... YOU CAN WATCH ME.
2. THIS IS A ROD AND REEL, SEE? YOU'LL CALL IT A "CASTING."
3. AND THAT'S WHAT I CALL AS A "SMALL."


1. YOU JUST CAN'T DO ANYTHING RIGHT, CAN YOU?
2. YOU BLOCKHEAD!!
3. I SEE YOUR SISTER'S BEEN YELLING AT YOU AGAIN
2. Please rate these written jokes as to how humorous they are. (Please rate them on a scale from 1 to 3, with 1 being "not humorous", 2 being "moderately humorous", and 3 being "very humorous". Please put a check beside the correct response.)

1. Little Tommy—"Sister Mary must be able to see in the dark." Tommy—"Because last night when she was sitting with Mr. Steady in the living room, I heard her say, "Why Rufus, you haven't shaved!"

2. "If I refuse to be your wife," she whispered dramatically, "will you really commit suicide?" "That," he said grandly, "has been my usual procedure."

3. A distinguished visitor to an insane asylum went to the telephone and found difficulty in getting a connection. Exasperated, he shouted to the operator: "Look here, girl, do you know who I am?"
"No," was the reply, "but I know WHERE you are."
4. Operator: Number, please?  
Drunk, in phone booth: Number? Hell, I want my peanuts.

5. "I promise you," said he with mock severity, "the next time you contradict me, I'm going to kiss you."
"Oh, no, you're not!", she cried.

6. To discover whether an ostrich is a male or female- ---tell a joke.....
   ... if he laughs, it's a male.
   ... if she laughs, it's a female.

3. Please fill in the answers to these one-liner jokes with an appropriate and humorous response (3 to 5 word answers please).

   1. A beggar told me he hadn't had a bite in days so I
   
   2. One word answer: Take my wife--

   3. The only time a bank will lend you money is when you can prove you

   4. Where does a 3-ton gorilla sit at the movies?

   5. Dorothy Parker: Boys don't make passes at girls who

   6. I know there's an audience out there. I hear you

   7. It was raining cats and dogs and I stepped in a (n)

   8. Did you hear about the David and Goliath cocktail? Two sips and you are

   9. I would never belong to a country club that would

4. Please fill in the balloons of the following cartoons with an appropriate and humorous response. (Fill in 1, 2, 3, or 4 of the balloons.)
5. How many times do you feel you laughed during this written assessment? ______

6. Please rate your humor, in general, on a scale of 1 to 5 (with 1 being "not humorous", 3 being "moderately humorous", and 5 being "very humorous"). ______ (Answer is number from 1—5.)

7. Tell the researcher your favorite humorous story.

On a scale of 1 to 3, (with 1 being "not humorous", 2 being "moderately humorous", and 3 being "very humorous"), rate the humor of your story. ______ (Answer is 1, 2, or 3)

8. Ask two other persons in this exercise group to rate your humor on a scale of 1 to 5. (Have them tell the researcher.)

9. Please give us your best friend's phone number so we may call & ask them to rate your sense of humor. (Please tell them we will be calling.) ______ (Local number, please).
APPENDIX D.

SVEBAK'S HUMOR QUESTIONNAIRE INSTRUMENT
Svebak's Sense of Humor Questionnaire

This questionnaire is concerned with the way you express and experience humor. Obviously, there is wide variation amongst individuals and therefore no right or wrong answers to these questions. Below you will find a list of statements. In the space at the beginning of each sentence, please indicate the degree to which you agree or disagree with that statement by writing a 1 (strongly disagree), 2 (mildly disagree), 3 (mildly agree), or 4 (strongly agree).

1. I can usually recognize a hint such as a twinkle in the eye or a slight change in the voice as a mark of humorous intent.
2. I have often joined in the laughter in a humorous situation only to wonder afterward what was so funny about it.
3. A humorist is typically perceived by others as a person who lacks the courage of his convictions.
4. I can usually find something comical, witty, or humorous in most situations.
5. People who tell jokes to make others laugh really do it to assert themselves.
6. People who are always out to be funny are really irresponsible and are not to be relied on.
7. I would say that I have much cause for amusement during an ordinary day.
8. Even though they may look different, humorous and depressed people really have many common traits.
9. I must admit that I am usually slow at noticing humorous points or catching on to jokes.
10. Humorists irritate me because they so blatantly revel in getting others to laugh.
11. When I engage in discussions where one person pokes fun at other people's arguments, I get the impression that he is trying to cover up his own ignorance.
12. I often miss the comical point in a situation where others catch on.
13. It is my impression that those who try to be funny really do it to hide their lack of self-confidence.

14. I feel that humorists often open my eyes to aspects of life that I seldom think about.
APPENDIX E.

SITUATIONAL HUMOR RESPONSE QUESTIONNAIRE INSTRUMENT
Humor and laughter mean different things to different people. Each of us has our own conceptions of what kinds of situations are funny, our own notions of the appropriateness of humor in various situations, and our own sense of the importance of humor in our lives.

In this questionnaire you will find descriptions of a number of situations in which you may have found yourself from time to time. For each question, please take a moment to recall a time when you were actually in such a situation. If you cannot remember such an experience, try to imagine yourself in such a situation, filling in the details in ways that reflect your own experience. Then indicate in the appropriate space on the answer sheet the letter (a, b, c, d, or e) which corresponds to the phrase that best describes the way you have responded or would respond in such a situation.

1. If you were shopping by yourself in a distant city and you unexpectedly saw an acquaintance from school (or work), how have you responded or how would you respond?
   a. I would probably not have bothered to speak to the person.
   b. I would have talked to the person but wouldn't have shown much humor.
   c. I would have found something to smile about in talking with him/her.
   d. I would have found something to laugh about with the person.
   e. I would have laughed heartily with the person.

2. If you were awakened from a deep sleep in the middle of the night by the ringing of the telephone, and it was an old friend who was just passing through town and had decided to call and say hello...
   a. I wouldn't have been particularly amused.
   b. I would have felt somewhat amused but would not have laughed.
   c. I would have been able to laugh at something funny my friend said.
   d. I would have been able to laugh and say something funny to my friend.
   e. I would have laughed heartily with my friend.

3. You had accidentally hurt yourself and had to spend a few days in bed. During that time in bed, how would you have responded?
   a. I would not have found anything particularly amusing.
   b. I would have smiled occasionally.
   c. I would have smiled a lot and laughed from time to time.
   d. I would have found quite a lot to laugh about.
   e. I would have laughed heartily much of the time.
4. When you have been engaged in some lengthy physical activity (e.g., swimming, hiking, skiing), and you and your friends found yourselves to be completely exhausted...
   a. I wouldn't have found it particularly amusing.
   b. I would have been amused, but wouldn't have shown it outwardly.
   c. I would have smiled.
   d. I would have laughed.
   e. I would have laughed heartily.

5. If you arrived at a party and found that someone else was wearing a piece of clothing identical to yours...
   a. I wouldn't have found it particularly amusing.
   b. I would have been amused, but wouldn't have shown it outwardly.
   c. I would have smiled.
   d. I would have laughed.
   e. I would have laughed heartily.

6. If a friend gave you a puzzle to solve and you found, much to your friend's surprise, that you were able to solve it quickly,
   a. I wouldn't have found it particularly amusing.
   b. I would have been amused, but wouldn't have shown it outwardly.
   c. I would have smiled.
   d. I would have laughed.
   e. I would have laughed heartily.

7. On days when you've had absolutely no responsibilities or engagements, and you've decided to do something you really enjoy with some friends, to what extent would you have responded with humor during that day?
   a. The activity we were engaged in would not have involved much smiling or laughter.
   b. I would have been smiling from time to time, but wouldn't have had much occasion to laugh aloud.
   c. I would have smiled frequently and laughed from time to time.
   d. I would have laughed aloud quite frequently.
   e. I would have laughed heartily much of the time.

8. You were traveling in a car in the winter and suddenly the car spun around on an ice patch and came to rest facing the wrong way on the opposite side of the highway. You were relieved to find that no one was hurt and no damage had been done to the car...
   a. I wouldn't have found it particularly amusing.
   b. I would have been amused, but wouldn't have shown it outwardly.
   c. I would have smiled.
   d. I would have laughed.
   e. I would have laughed heartily.
9. If you were watching a movie or T.V. program with some friends and you found one scene particularly funny, but no one else appeared to find it humorous, how would you have reacted most commonly?
   a. I would have concluded that I must have misunderstood something or that it wasn't really funny.
   b. I would have "smiled to myself," but wouldn't have shown my amusement outwardly.
   c. I would have smiled visibly.
   d. I would have laughed aloud.
   e. I would have laughed heartily.

10. If you were having a romantic evening alone with someone you really liked (girlfriend, boyfriend, spouse, etc.)...
   a. I probably would have tended to be quite serious in my conversation.
   b. I'd have smiled occasionally, but probably wouldn't have laughed aloud much.
   c. I'd have smiled frequently and laughed aloud from time to time.
   d. I'd have laughed aloud quite frequently.
   e. I'd have laughed heartily much of the time.

11. If you got an unexpectedly low mark on an exam and later that evening you were telling a friend about it...
   a. I wouldn't have been amused.
   b. I would have been amused, but wouldn't have shown it outwardly.
   c. I would have been able to smile.
   d. I would have been able to laugh.
   e. I would have laughed heartily.

12. You thought you recognized a friend in a crowded room. You attracted the person's attention and hurried over to him/her, but when you got there you discovered you had made a mistake and the person was a total stranger...
   a. I wouldn't have found it particularly amusing.
   b. I would have been amused, but wouldn’t have shown it outwardly.
   c. I would have smiled.
   d. I would have laughed.
   e. I would have laughed heartily.

13. If you were eating in a restaurant with some friends and the waiter accidentally spilled a drink on you...
   a. I wouldn’t have found it particularly amusing.
   b. I would have been amused, but wouldn’t have shown it outwardly.
   c. I would have smiled.
   d. I would have laughed.
   e. I would have laughed heartily.
14. If you were crossing a street at a crosswalk and an impatient car driver, who had had to stop for you, honked the horn...
   a. I wouldn't have found it particularly amusing.
   b. I would have been amused, but wouldn't have shown it outwardly.
   c. I would have smiled.
   d. I would have laughed.
   e. I would have laughed heartily.

15. If there had been a computer error and you had spent all morning standing in line-ups at various offices trying to get the problem sorted out...
   a. I wouldn't have found it particularly amusing.
   b. I would have been amused, but wouldn't have shown it outwardly.
   c. I would have smiled.
   d. I would have laughed.
   e. I would have laughed heartily.

16. If the teacher announced that s/he would hand back the exams in order of grade, beginning with the highest mark in the class, and your name was one of the first to be called...
   a. I wouldn't have found it particularly amusing.
   b. I would have been amused, but wouldn't have shown it outwardly.
   c. I would have smiled.
   d. I would have laughed.
   e. I would have laughed heartily.

17. In the past, if your girlfriend (or boyfriend) decided to break up with you because s/he had found someone else, and a few days later you were telling a good friend about it...
   a. I wouldn't have found any humor in the situation.
   b. I would have been able to experience some amusement, but wouldn't have shown it.
   c. I would have been able to smile.
   d. I would have been able to laugh.
   e. I would have laughed quite a lot.

18. If you were eating in a restaurant with some friends and the waiter accidentally spilled some soup on one of your friends...
   a. I wouldn't have found it particularly amusing.
   b. I would have been amused, but wouldn't have shown it outwardly.
   c. I would have smiled.
   d. I would have laughed.
   e. I would have laughed heartily.
19. In choosing your friends, how desirable do you feel it is for them to be easily amused and able to laugh in a wide variety of situations?
   a. the most important characteristic I look for in a friend
   b. very desirable, but not the most important characteristic
   c. quite desirable
   d. neither desirable nor undesirable
   e. not very desirable

20. How would you rate yourself in terms of your likelihood of being amused and of laughing in a wide variety of situations?
   a. my most outstanding characteristic
   b. above average
   c. about average
   d. less than average
   e. very little

21. How much do you vary from one situation to another in the extent to which you laugh or otherwise respond with humor? (i.e., how much does it depend on who you are with, where you are, how you feel, etc.?)
   a. not at all
   b. not very much
   c. to some extent
   d. quite a lot
   e. very much so
APPENDIX F.

COPING HUMOR SCALE INSTRUMENT
This questionnaire is concerned with the way you express and experience humor. Obviously, there is wide variation among individuals and therefore no right or wrong answers to these questions. Below you will find a list of seven statements. In the space at the beginning of each sentence, please indicate the degree to which you agree or disagree with that statement by writing a 1 (strongly disagree), 2 (mildly disagree), 3 (mildly agree), or 4 (strongly agree).

1. I often lose my sense of humor when I'm having problems.

2. I have often found that my problems have been greatly reduced when I tried to find something funny in them.

3. I usually look for something comical to say when I am in tense situations.

4. I must admit my life would probably be easier if I had more of a sense of humor.

5. I have often felt that if I am in a situation where I have to either cry or laugh, it's better to laugh.

6. I can usually find something to laugh or joke about even in trying situations.

7. It has been my experience that humor is often a very effective way of coping with problems.
APPENDIX G.

FITNESS HISTORY
Thank you for your time and effort in participating in this research study. (Participation in this study will give you an A+ in this exercise clinic.)

Please answer the following questions by circling the correct part of the question. See the example below:

Example: I am more fatigued or less fatigued today than I was 3 years ago.

1. I am more physically well or less physically well today than I was 3 years ago.
2. I get more exercise or less exercise today than I did 3 years ago.
3. I am more mentally well or less mentally well today than I was 3 years ago.
4. My life is more stressed or less stressed today than it was 3 years ago.
5. I am more humorous or less humorous today than I was 3 years ago.
6. I exercise approximately: one two three four five six seven eight or more hours per week. (Circle one answer.)
7. I have: children living at home with me or no children living at home.
8. I am: married or not married.
9. I like to exercise more or less today than I did 3 years ago.
10. I smoke more or less than I did 3 years ago (or I don't smoke).
11. I laugh more or less than I did 3 years ago.
12. I read the comics in the newspaper or magazines: yes no
13. I feel better when I exercise: yes no
APPENDIX H.

ACTUAL AND IDEAL HAPPINESS SCALE
ACTUAL AND IDEAL HAPPINESS SCALE

Instructions:

Following is a series of paired statements regarding your state of happiness in life. Please answer each statement with a whole number from 1-99 in the space before each statement. You may use the full range of numbers. Answer "1" if you believe the statement is not contributing to your happiness. Answer "99" if you believe the statement is contributing substantially to your happiness. Respond "50" if you are uncertain or neutral about whether the statement is contributing to your happiness in life.

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EXAMPLE

1. Making my own decisions.
   
   60 (a) How much is this element contributing to your happiness?
   99 (b) How much do you want this element to contribute to your happiness?

Explanation: This individual responded with the number 60 to indicate how "making her own decisions" was contributing to her present happiness. In the second statement she chooses the number 99 to indicate that she wants this element to be a stronger part of her future happiness.

---

HOW MUCH IS EACH STATEMENT CONTRIBUTING TO YOUR HAPPINESS IN LIFE?

1. Thinking about goals that I would like to achieve.
   
   (a) How much is this element contributing to your happiness?
   (b) How much do you want this element to contribute to your happiness?

2. Feeling satisfied with my body shape and size.
   
   (a) How much is this element contributing to your happiness?
   (b) How much do you want this element to contribute to your happiness?

3. Being sexually appealing to others.
   
   (a) How much is this element contributing to your happiness?
   (b) How much do you want this element to contribute to your happiness?

HOW MUCH IS EACH STATEMENT CONTRIBUTING TO YOUR HAPPINESS IN LIFE?

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   (a) How much is this element contributing to your happiness?
   (b) How much do you want this element to contribute to your happiness?

5. Teaching others new skills.
   (a) How much is this element contributing to your happiness?
   (b) How much do you want this element to contribute to your happiness?

6. Writing for pleasure.
   (a) How much is this element contributing to your happiness?
   (b) How much do you want this element to contribute to your happiness?

7. Obtaining knowledge by reading.
   (a) How much is this element contributing to your happiness?
   (b) How much do you want this element to contribute to your happiness?

8. Helping others.
   (a) How much is this element contributing to your happiness?
   (b) How much do you want this element to contribute to your happiness?

9. Thinking about the accomplishments I have achieved so far in life?
   (a) How much is this element contributing to your happiness?
   (b) How much do you want this element to contribute to your happiness?

10. Feeling satisfied with my physical appearance.
    (a) How much is this element contributing to your happiness?
    (b) How much do you want this element to contribute to your happiness?

11. Spending time with children.
    (a) How much is this element contributing to your happiness?
    (b) How much do you want this element to contribute to your happiness?

12. Solving work or school-related problems.
    (a) How much is this element contributing to your happiness?
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<td>Having a good relationship with one or more parent.</td>
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<td>(a) How much is this element contributing to your happiness?</td>
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<td>(b) How much do you want this element to contribute to your happiness?</td>
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<td>21.</td>
<td>Volunteering time to help those in need.</td>
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<td>(a) How much is this element contributing to your happiness?</td>
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<td>(b) How much do you want this element to contribute to your happiness?</td>
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HOW MUCH IS EACH STATEMENT CONTRIBUTING TO YOUR HAPPINESS IN LIFE?

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<th>40</th>
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</table>

22. Being concerned about my physical appearance.
   (a) How much is this element contributing to your happiness?
   (b) How much do you want this element to contribute to your happiness?

23. Being a good friend to others.
   (a) How much is this element contributing to your happiness?
   (b) How much do you want this element to contribute to your happiness?

24. Thinking about current academic and/or professional goals.
   (a) How much is this element contributing to your happiness?
   (b) How much do you want this element to contribute to your happiness?

25. Maintaining my health throughout my life.
   (a) How much is this element contributing to your happiness?
   (b) How much do you want this element to contribute to your happiness?

26. Making time to think about current academic and/or professional goals.
   (a) How much is this element contributing to your happiness?
   (b) How much do you want this element to contribute to your happiness?

27. Evaluating others' opinions about my attractiveness.
   (a) How much is this element contributing to your happiness?
   (b) How much do you want this element to contribute to your happiness?

   (a) How much is this element contributing to your happiness?
   (b) How much do you want this element to contribute to your happiness?

29. Writing, related to academic and/or other areas.
   (a) How much is this element contributing to your happiness?
   (b) How much do you want this element to contribute to your happiness?

30. Maintaining a loving relationship with at least one person.
   (a) How much is this element contributing to your happiness?
   (b) How much do you want this element to contribute to your happiness?
APPENDIX I.

KASCH BENCH STEP TEST
The Three-Minute Step Test

A few YMCA's have a need for mass testing of participants. Because of equipment needs, the bicycle is unsuited for this task. The Three-Minute Step Test can be used very successfully in mass testing situations. This is an excellent cardiorespiratory test not only for mass testing, but also as a self test or an addition to a test battery. Minimal equipment is required and participants can learn to administer it themselves. When used as a self test the participant can count the carotid or radial pulse, however, when done as a part of the test battery it should be done as described here.

Equipment:

1. A 12-inch high, sturdy bench
2. A metronome set at 96 bpm (four clicks of the metronome equals one step — up, up, down, down) 24 steps per min. See note at end of chapter
3. A timing clock for the 3-minutes, and a recovery clock (these may be the same)
4. A stethoscope to count recovery heart rate.

Procedure:

1. Demonstrate the stepping. Participants will face the bench and in time with the metronome step one foot up on the bench (1st beat), step up with the second foot (2nd beat), step down with one foot (3rd beat), and step down with the other foot (4th beat). See Figures 4-27 through 4-32
2. Explain the test to the participant and the importance of sitting down quickly at the end of three minutes and resting quietly for one minute so that the tester can take a heart rate.
3. Position the participant facing the bench and allow him/her to pick up the beat of the metronome.
4. Begin the test and begin keeping time. Check the rhythm and correct if necessary. Tell the participant as time passes, “One minute, two minutes,” etc.
5. When 20 seconds remain tell the participant that he/she is to sit down 
quickly at the end of the stepping and wait for the tester to take a heart 
rate. Put stethoscope in ears and prepare recovery timer. On the last step it 
is helpful to say "Last step — up, up, down and sit down."

6. When the participant sits down, immediately place the stethoscope on the 
chest, get the rhythm, and start counting for one full minute. The recovery 
rate must be started within five seconds or the heart rate will be signifi­
cantly different. NOTE: Pay close attention to the heart's rhythm which 
can change suddenly during recovery. It is easy to lose count. The one-
minute count reflects the heart's rate at the end of stepping as well as 
reflecting the rate of recovery.

7. The total one-minute post-exercise heart rate is the score for the test and 
and can be recorded and compared to norms or previous test results, if 
appropriate. Score the total one-minute post-exercise heart rate, in beats 
per minute.

to Physical Fitness (3rd ed.). Champaign: Human Kinetics 
APPENDIX J.

3-MINUTE STEP TEST NORMS
### MALES

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<th>RANKING</th>
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### FEMALES

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<th>46-55</th>
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<td>88</td>
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<td>Good (80%)</td>
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<td>97</td>
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<td>106</td>
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<td>Below Average (35%)</td>
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<td>Poor (20%)</td>
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<td>131</td>
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<td>131</td>
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<tr>
<td>Very Poor (5%)</td>
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<td>146</td>
<td>147</td>
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APPENDIX K.

PARTICIPANT INFORMED CONSENT
PARTICIPANT INFORMED CONSENT

Please read all of the following information carefully:

The purpose of this research is to study the relationship of humor and happiness as components of wellness. Humor and happiness are often discussed but not necessarily studied as a part of the empirical data of wellness; thus, the purpose of this study will be to provide empirical evidence for humor and happiness, as aspects of wellness. The wellness of the subjects will be determined by the subjects' cardiorespiratory fitness (as determined by a step test).

The researcher is a doctoral candidate in the field of counselor education in the professional studies department. This research project is being done for the researcher's doctoral dissertation.

The participants in this research project will be asked to complete the following:

A. Take one written assessment that will be given shortly before, during, or after the hour exercise session. This assessment should take approximately 15 minutes and will be taken individually with some assistance with the researcher or observer present. Four brief written assessments will be sent home with each participant and will be asked to be returned to the exercise clinic or the researcher at the exercise clinic within 5 days.

The exercise clinic personnel may request a cardiorespiratory step test from each participant in the event that they have not had one in the past 3 months. The researcher will not be supervising or giving this step test as it is an exercise clinic requirement for exercise clinic participants. The results of this cardiorespiratory step test will be used and cited in reference to each participant in the researcher's study.

B. Participants will be assigned code numbers during the written assessments, step tests, and while reviewing the participants' health records and health histories (as obtained and kept by the exercise clinic staff). The researcher will assure strict confidentiality at all times. The names and data collected during this research will be retained on paper from approximately March 4, 1991 until December 30, 1991 (which will be the approximate time the dissertation should be completed.)

C. The in-class written assessment should take approximately
15 minutes and the take-home written assessments should take approximately 30 minutes to complete. If a participant does not want to miss 15 minutes of in-class exercise, we will schedule a 15-minute test-taking time before or after the participant's scheduled exercise class. The in-class written assessment will be taken individually and not as a group, so the times will need to be staggered. The place for this written test will be in the same room as the exercisers, perhaps in a corner of the room at a desk or table where the participant will be able to easily write.

D. The location of this research activity will be in the Physical Education Building in the various exercise clinic rooms numbered Gym 175, Gym 184, Room 207, and in the swim pool area. The times for this research will be the regularly-scheduled exercise clinic times for Adult Fitness, Aerobics, and Aquatics from the hours of 6 - 7 AM., 12 noon - 1 PM., 5:15 - 6:15 PM., and 5:30 -6:30 PM on all weekdays.

E. The researcher, impartial observers, and exercise clinic personnel will all be instructed of the purpose of this research and of the necessity of strict confidentiality throughout the entire research project. The data with names on it will be destroyed by Dec. 30, 1991 (upon completion of the researcher's written doctoral dissertation).

F. This study is not longitudinal, and subjects will be sent the doctoral dissertation results if they so desire.

G. The participation in this research project is entirely voluntary, and if the subjects choose not to participate, or to withdraw their consent, or their participation, they will in no way be subjected to any criticism or prejudice for doing so. No risks for the subjects are foreseen.

Signature of principal investigator

Signature of major professor

If, at any time, you, as a participant in this study, should have any questions concerning this research, please feel free to ask the researcher during her presence at the exercise clinic sessions, or feel free to call the researcher at her home at 296 7501.
1. __________________________, give my signed consent to participate in the above dissertation research project. I have been informed of all the necessary procedures by reading the above information. I will feel free to ask any questions I have, or to voice any concerns that I may have throughout the entire research project. I am aware that the researcher will have access to my health history and fitness progress results found in my exercise clinic folder.

I realize that one assessment I need to take during the exercise clinic class period will take approximately 15 minutes. I would prefer to be tested at the following time (one 15-minute time period sometime from March 4–March 29):

_______ before my regularly-scheduled exercise class
_______ during my regularly-scheduled exercise class
_______ after my regularly-scheduled exercise class

If I want the tabulated results from the research and dissertation, I will write my name and address below in the space provided.

__________________________________________

__________________________________________
APPENDIX L.

EXERCISE CLINIC SUPERVISOR LETTER
To whom it may concern:

This letter is in reference to the use of I.S.U. Exercise Clinic participants in the research project of Kay Bartels. The I.S.U. Exercise Clinic program is an adult fitness program sponsored through the Physical Education Department at Iowa State University. Individuals entering the Exercise Clinic program undergo routine physical fitness assessments which include a submaximal, 3 minute bench stepping test for cardiorespiratory fitness assessment. These tests are performed with participant informed consent and administered by graduate/undergraduate students in the physical education department.

In addition, the Exercise Clinic participants have been solicited to participate in various aspects of research projects. The participation has always been volunteer and restricted to projects which have been approved by the Iowa State University Human Subjects Committee on Research. Kay Bartels has requested permission to solicit volunteers from the Exercise Clinic program for her research project. She has assured me that potential volunteers will be informed of the nature of the research and their expected commitment to the project. In addition, she will secure approval from the Human Subjects Committee on Research and informed consent from each subject.

As supervisor of the I.S.U. Exercise Clinic, I have informed Kay that she may request volunteers from the various exercise classes for her research project.

Sincerely;

Lyle Kesl, Program Supervisor
I.S.U. Exercise Clinic
250 P.E.B.
Iowa State University
Ames, Iowa 50011

February 23, 1991
APPENDIX M.

PARTICIPANT INFORMED CONSENT (PHYSICAL EDUCATION DEPARTMENT)
Iowa State University Exercise Clinic
Department of Physical Education

PARTICIPANT INFORMED CONSENT

PLEASE READ ALL OF THE FOLLOWING INFORMATION CAREFULLY:

I have volunteered to participate in a program of progressive physical exercise. To my knowledge I do not have any limiting physical condition or disability which would preclude an exercise program. I accept complete responsibility for my health and well-being in the voluntary fitness program and related testing and understand that no responsibility is assumed by the supervisors of the program, sponsoring Department, or Iowa State University. I fully realize and am aware of the risks involved with any fitness program which involves strenuous exercise. I acknowledge and voluntarily accept these risks.

I have completed a health/exercise history questionnaire designed to ascertain my previous level of physical activity and medical history. Based upon evaluation of this questionnaire, I may be required to obtain my physician's consent before participating in any testing or exercise programs. This information is only to be viewed by those Exercise Clinic staff involved in my exercise programming.

I also will perform a series of physical fitness tests to assess my current level of physical fitness. These tests include resting cardiovascular measures (heart rate and blood pressure), a respiratory test (vital capacity), cardiovascular fitness assessment (step test or submaximal bicycle test), flexibility measurements, and anthropometric measurements (weight, height, girth measurements, body fat assessment), and strength assessments. I realize that during fitness testing I may feel the normal distress that accompanies physical exertion.

I may also be required or choose to perform a graded exercise test on either a motorized treadmill or bicycle ergometer. The work levels will begin at a level I can easily accomplish and will progress in increasingly more difficult stages. My electrocardiogram and blood pressure will be monitored before, during, and after the exercise test. I realize that I will undergo a preliminary physical examination by a physician prior to the graded exercise test who will be present to supervise the test, provide emergency care, and provide an interpretation of my test results.

I may choose to participate in blood lipid screening which would involve a needle-drawn blood sample from the arm. This blood draw may result in temporary discomfort as the needle is introduced.
Although test administrators observe for signs of unusual fatigue or discomfort, these observations do not always indicate abnormal discomfort. Emergency equipment and trained personnel are available to deal with unusual situations which may arise. I understand that I am free to ask questions about procedures, etc., if I desire further explanation.

I understand that emergency treatment of any injuries that may occur as a direct result of my participation in this program will be treated at the Iowa State University Health Services, Student Services Building, and/or referred to Mary Greeley Hospital or another physician. Compensation for treatment of any injuries that may occur as a direct result of participation in this program may or may not be paid by Iowa State University depending on the Iowa Torts Claims Act. Claims for compensation will be handled by the Iowa State University Vice President for Business and Finance.

Results obtained from the fitness tests, graded exercise tests, or other evaluation processes may, in the future, be used in written or oral research reports but strict standards of individual subject confidentiality will be adhered to.

I certify that I have read and understand the contents of this document, and have knowingly and voluntarily consented to participation by my signature below.

SIGNATURE ______________________  DATE ______________________

WITNESS ______________________

is a minor, ________ years of age, and I as parent/legal guardian, having read and understood this document, give my consent for her/his participation.

SIGNATURE OF: __________ PARENT  __________ LEGAL GUARDIAN  DATE ______________________