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SELF-TALK AND
EXERCISE BEHAVIOR

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Degree
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Lorraine Ackerman Hart

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ABSTRACT

This study examined the relationship between self-verbalization about exercise and actual exercise behavior. One hundred and seventy-four male and female undergraduate and graduate students at The University of Tennessee, Knoxville were the volunteer subjects for the study. Two questionnaires were designed especially for this study. Reliability was established for certain portions of these instruments. The Physical Activity Questionnaire provided information about the amount of time and effort spent in exercise during the warm and cold seasons of the year and made it possible to divide the sample into low, medium, and high exercisers. The Self-Talk and Exercise Questionnaire provided information about the frequency and influence of a variety of proexercise and antiexercise self-statements for these groups of exercisers.

One-way ANOVAs were performed to find out if significant differences existed between the groups of exercisers in their responses to the Self-Talk and Exercise Questionnaire. Scheffé was used to locate any differences. A relationship between self-verbalization and exercise behavior was demonstrated. Results demonstrated that there were differences in the frequency and influence of the self-statements of the groups of exercisers primarily during winter conditions. During winter conditions, high exercisers emitted more proexercise and fewer antiexercise self-statements than did the low exercisers and gave a higher rating to the influence of their proexercise self-statements; also, low exercisers emitted more

antiexercise self-statements than did the middle and high groups.

During the summer conditions, only one significant difference occurred between groups: the low exercisers emitted more antiexercise self-statements than did the middle and high groups.

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CHAPTER I

PROBLEM, RATIONALE, AND RELATED LITERATURE

Introduction

It is generally believed that active participation in physical exercise and sports is a necessary ingredient of the healthy life; yet 45% of all adult Americans do not engage in physical activity for the purpose of exercise (Insel & Roth, 1979). C. Carson Conrad, executive director of the President's Council on Fitness and Sports (1983), summarized the situation nicely in a speech to Congress in which he asked Congress to investigate the sorry state of physical fitness in America. He attributed the lack of fitness to the life-style in the United States, with its reliance on automobiles to get us places, machines to produce the goods, and television to entertain us. How can we account for the fact that some people do, nevertheless, manage to exercise regularly, while others of us are sedentary?

There has been a recent trend among psychologists to study the influence of mental events or cognitive factors on an individual's behavior. Considerable research suggests that what we say or tell ourselves can influence our subsequent behavior. This researcher felt it would be valuable to find out how self-talk might relate to individuals' exercise habits. Does self-talk affect exercise in much the same way as it does other overt behaviors? A more accurate assessment of self-verbalizations might be beneficial

in leading to advances in prescriptive treatment for nonexercisers , (Kendall, 1982).

Statement of Purpose

A general purpose of this study was to explore the relationship between self-verbalization about engaging in exercise and sports activities and actual exercise participation. One questionnaire was constructed and then employed to find out how much people actually exercised. This researcher was interested in the number of hours a person engaged in exercise and in the vigor or intensity of his/her activities. Thus, a person who played tennis singles for 2 hours a day would be considered to have engaged in more exercise than a person who spent 2 hours a day gardening. The intensity of the activity was measured in METS. METS will be further defined in the Methods section.

Another questionnaire was constructed and then employed to determine the content, frequency, and influence of various self-verbalizations or self-statements used by people to encourage or discourage themselves from exercising. The variables under consideration were: the amount of exercise during the warm season, the amount of exercise during the cold season, the frequency and influence of proexercise self-verbalizations, and the frequency and influence of antiexercise self-verbalizations. It was hypothesized that the self-verbalizations related to engaging in exercise would be different in content, frequency, and influence for exercisers and nonexercisers.

Specific purposes of this study were to discover whether

- (a) exercisers engage in a greater frequency of proexercise (positive) self-statements that influence them than do low exercisers, and
- (b) whether low exercisers engage in a greater frequency of antiexercise (negative) self-statements that influence them than do exercisers.

An incidental purpose of this study was to develop an inventory of self-statements about engaging or not engaging in exercise that would discriminate exercisers from nonexercisers.

Self-Verbalizations: Theoretical Issues

When this researcher refers to self-talk or self-verbalizations, she is referring to a silent conversation one has with oneself. As long ago as the fourth century B.C., Plato in his Theaetetus talked about ". . . the conversation which the soul holds with herself in considering of anything" (Jowett, 1892, p. 252).

Silent conversations are not necessarily limited to dialogues with oneself. We are all aware of inner conversations we have had with other people, animals, and inanimate objects. This researcher recently found herself silently imploring a computer to ignore some of her small errors for the sake of running her computer program.

Inner conversation has been variously referred to as inner speech, low amplitude speech, private speech, inner talk, conscious thought, inaudible speech, internal dialogue, private speech, soundless mental speech, concealed verbalization, speech to oneself, and coverants of the mind.

In Inner Speech and Thought, the Russian psychologist Sokolov (1972) discusses the various theories about inner speech and thought. He says that some theorists believe that inner speech and thought are the same, while others view inner speech as the tail end of a thought. In addition, there are unresolved issues concerning whether it is possible to think without inner speech, or, conversely, have inner speech without thought. Sokolov does not have the answer to these fascinating questions. From his discussion, it is apparent that there is at least general agreement that thoughts and inner speech, if not identical, are interwoven. Sokolov does believe: "The elements of inner speech are found in all our conscious perceptions, actions, and emotional experiences, where they manifest themselves as verbal sets, instructions to oneself, or as verbal interpretations of sensations and perceptions" (p. 1). He also says that inner speech is an important and universal mechanism in human consciousness and psychic activity.

How does internal speech develop? A prevalent view is that the development of inner speech follows after the development of external speech in children (Luria, 1981). Young children have been observed talking out loud to themselves. As they mature, their external speech diminishes and becomes internal. On the other hand, it also has been speculated that external and internal speech occur simultaneously (Blonski, cited in Sokolov, 1972).

It has been proposed that inner speech is similar to external speech, but more abbreviated and simpler in syntax (Vygotsky, 1962). Vygotsky contends that the predicate form of speech dominates

self-talk. The subject of a sentence and the parts related to it are omitted. As a result, inner speech expresses thoughts in a condensed form. When talking to oneself, the subject is understood.

If self-verbalizations cannot be observed, are they still a legitimate domain for researchers? Homme (1965), in a classic paper, proposes that private behavioral events obey the same laws as public events or nonprivate ones. In his view, self-verbalizations are covert operants, or covert responses, which operate on the environment. He believes that these operants could be subjected to experimental scrutiny and experimental control. He also points out that thoughts are observable, but only to a public of one. Ledwidge (1979), however, disagrees and asserts that cognitions are only hypothetical constructs used to account for relationships between environmental events and behavior.

Mahoney (1974) says in Cognition and Behavior Modification that mental events can be scientifically studied. Basically, he believes that psychologists cannot explain many phenomena if they limit themselves to what he calls "black box" psychology which relies solely on stimulus-response theories. In particular, he mentions that it would be impossible to explain vicarious learning and responses to imaginal stimuli, as well as factors such as awareness, attention, and expectancy, without recognizing the role of mediational factors, or what he calls internal events. Mahoney points out the pervasiveness of inner talk when he says that "our lives are predominantly composed of private responses to private environments--ranging from monologues in the shower to senile

reveries" (p. 1). A review of the literature suggests that our internal dialogues can relate to anything we think about, including our fears, aspirations, attributions, beliefs, self-instructions, reminders, feelings, memories, and rehearsals for future activities.

Modification of Self-Talk: Evidence from Cognitive Behavioral Interventions

The rationale for this study is that self-verbalizations are important and worthy of study because they are modifiable. A considerable amount of research evidence has accrued since 1970 which indicates that covert responses can be modified and that covert changes lead to changes in overt behavior. If we want to bring about desirable behavior change and cannot control the setting events or the external reinforcements, we can attempt to modify self-verbalizations. If there are indeed differences in the self-verbalizations of active and physically inactive persons, this information might be utilized to change or at least influence the cognitions of inactive persons who wish to be physically active.

The research evidence concerning self-statement modification and behavior change derives from experimental studies of treatment procedures that have been collectively called cognitive-behavioral interventions. In every intervention, the experimenter or therapist assesses maladaptive mental processes and subsequently arranges learning experiences which will alter cognitions and, in turn, maladaptive behaviors.

In Cognitive Behavior Modification, Meichenbaum (1977) provides a very thoughtful and thorough review of the cognitive behavior modification research that has accrued since 1969. The central purpose of his review is to demonstrate that altering a person's self-talk or cognitions would lead to desired behavior changes. Meichenbaum includes accounts of his own extensive research as well as accounts of the research of other psychologists.

In the first half of the book, he describes how subjects can be taught to self-instruct, i.e., use self-guiding talk, to improve their problem behavior. For example, in one of his own studies, low creative college students were made aware of how their own self-talk inhibited creative performance. They were then trained to produce self-statements that were compatible with creativity. These students showed a significant increase in originality and flexibility in thinking when retested on tests of divergent thinking.

This self-instructional strategy brought about behavioral changes in diverse populations in the laboratory and in natural settings too. Schizophrenics were taught to emit healthy talk. Hyperactive-impulsive children were able to improve their performance on cognitive tasks which required concentration by telling themselves to pay attention. Aggressive children reduced their incidence of aggressive behavior by telling themselves it was not necessary to fight back. "Social-isolate" children became more outgoing by telling themselves it was alright to approach others. Preschool

children learned to use self-guiding talk to delay gratification and resist temptation.

In the latter part of Cognitive Behavior Modification, Meichenbaum (1977) reviews research in which the self-instructional strategy is just one component of a complex behavioral intervention such as cognitive restructuring or stress inoculation. These particular interventions were successful in reducing phobic avoidance behaviors, enhancing or improving dating skills in college students, and helping clients deal with problems such as pain tolerance, undesirable eating behavior, speech anxiety, and excessive anger.

We have further evidence that self-statements are important and can be modified. Rational-emotive therapy (RET) is a treatment procedure that has as its central core the belief that it is not what actually takes place in our lives that causes us discontent and unhappiness, but rather what we say to ourselves about these events (Ellis, 1977). Albert Ellis, the clinical psychologist who developed RET, attempts to help his clients recognize their irrational beliefs and to substitute rational ones which will foster their mental health and adjustment. There were no carefully controlled studies with a clinical population to substantiate the efficacy of this treatment approach until Lipsky, Kassirer, and Miller (1980) studied the effectiveness of RET. Their subjects were 50 adults who had applied for psychotherapy from an outpatient community mental health center. The subjects were randomly assigned to the following five treatment groups: (1) RET, (2) RET plus rational role reversal, (3) RET plus rational-emotive imagery,

(4) an attention alternate treatment control, and (5) a no-contact group. The dependent variables administered before and after the 12-session therapy included measures of rational thinking, anxiety, depression, and neuroticism. The researchers found that RET alone, or in combination with rational role reversal or rational-emotive imagery, was superior to both the no-contact group and the alternate treatment condition. The authors acknowledge that a limitation of this study was the use of self-report measures exclusively and the lack of any behavioral measures.

The cognitive therapy of depression is an important cognitive behavioral intervention characterized by its focus on the relationship between faulty cognitions and distressed behavior. Aaron Beck, another well known clinical psychologist, treats depression by having his clients modify their distorted cognitions or self-statements (Burns & Beck, 1978). Whereas Ellis (1977) concerned himself with correcting his clients' "irrational thoughts," Beck attempts to change the negative self-statements and negative views clients have of themselves, their present life circumstances, and future possibilities (Beck, Rush, Shaw, & Emery, 1979). His cognitive therapy of depression has prompted many research studies which have established the efficacy of the treatment for depression.

In one recent study, Rush, Beck, Kovacs, and Hollon (1977) compared the efficacy of the Cognitive Therapy of Depression to pharmacotherapy in the treatment at the Hospital of the University of Pennsylvania. Patients were assigned to either a cognitive therapy or an antidepressant drug treatment on a random basis.

The subjects were tested before and after a 12-week period of treatment. In this case, the dependent variables were clinical assessments on the Hamilton Rating Scale for Depression (completed by an independent clinician) and the Raskin Scale (completed by the involved therapist) and the self-report of the clients on the Beck Depression Inventory.

It turned out, not unexpectedly, that both treatment groups showed a significant decrease in depression symptomatology. Nevertheless, the cognitive therapy treatment proved to be more effective since almost 80% of the clients receiving the cognitive treatment showed marked clinical improvement as compared to 22% of the drug treatment group.

Content and Assessment of Self-Talk

There has been a paucity of systematic assessment of self-talk, but recently several questionnaires have been developed to assess self-verbalizations associated with specific feelings, attitudes, and behaviors. One of the earliest instruments of this kind, the Assertiveness Self-Statement Test (ASST), measured subject responses to 17 positive and 17 negative self-statements pertaining to assertion (Schwartz & Gottman, 1976).

Subjects in Schwartz and Gottman's study completed the questionnaire after they had first been exposed to stimulus situations in which unreasonable requests had been made. They then were asked to indicate on a scale from 1 to 5 how frequently these self-statements characterized their thoughts during the preceding

situation, with 1 = hardly ever and 5 = very often. Positive statements included: "I was thinking that it doesn't matter what the person thinks of me"; "I was thinking that I was perfectly free to say no"; "I was thinking that this request was an unreasonable one" (p. 913). In contrast, negative statements included: "I was worried about what the other person would think about me if I refused"; "I was thinking that the other person might be hurt or insulted if I refused" (p. 913).

The researchers found that low assertive subjects chose an equal number of positive and negative self-statements whereas the moderate and high assertive subjects chose significantly more positive than negative self-statements. Schwartz and Gottman (1976) suggest that low assertive subjects may have an "internal dialogue of conflict" between their positive and negative self-statements making it more difficult for them to act effectively.

Kendall, Williams, Pechacek, Graham, Shisslak, and Herzoff (1979) used a 20-item inventory, with 10 positive and 10 negative thoughts which they called the Self-Statement Inventory (SSI) to assess the cognitions of patients who had undergone medical treatment in a hospital. The authors found that patients who had adjusted poorly to their treatment had a higher level of negative self-talk than did those who had adjusted well. There were no differences between the groups in the incidence of positive self-talk.

These two studies used similar methods to develop their scales. Both groups of authors produced an initial list of

self-statements that were thought to be important for the situation being studied. They then had normal individuals validate the items. Only items receiving 90% consensual agreement for the ASST, and 100% consensual agreement for the SSI, were used in the final scale (Kendall, 1982).

Hollon and Kendall (1980) used a different approach to develop their Automatic Thoughts Questionnaire (ATQ). This 30-item inventory of negative cognitions associated with depression was developed via the comparison of known groups of depressed and nondepressed persons. The authors first asked 788 students to provide a thought that might come into their heads while they were depressed. From the list of negative self-statements generated by the students, the researchers selected those 30 items for the ATQ which significantly differentiated the previously identified depressed and nondepressed persons. The resulting ATQ was cross validated on another sample of known groups to eliminate chance discriminations. In contrast to the other inventories which have an equal number of positive and negative statements, the ATQ consists entirely of negative ones.

Kendall and Finch (1979) have investigated the cognitions of impulsive children. Although they do not present systematic evidence for their position, they suggest that these children do not have more negative or maladaptive self-statements than normal children but rather lack self-verbalizations that would ordinarily help them to control their behavior. These children are described as having a deficit in their internal dialogue. One particular deficit

mentioned is their lack of appropriate verbal strategies for search and scan behavior.

Kendall (1982) pointed out that, in addition to finding out the content of a person's self-verbalizations, it is important to find out the specific meaning each statement has for the individual and the degree to which the person believes each self-statement. Another consideration Kendall mentions is the sequence of self-statements. He posits that negative self-statements, immediately countered by positive retorts, may have less influence over a person's behavior than would negative self-statements alone. Thus, evaluating the influence and sequencing of self-statements would appear to be a fruitful area for research.

In related work, several years before the development of the previously discussed instruments to assess cognitions, Kenyon (1968) developed what is known as the Kenyon Scales for Assessing Attitudes toward Physical Activity. This scale has been widely used to assess the motives of athletes and nonathletes for participating in sports. Its six scales define attitudes towards sports participation. They are (1) physical activity as a social experience, (2) physical activity for health and fitness, (3) physical activity as the pursuit of vertigo, (4) physical activity as an aesthetic experience, (5) physical activity as catharsis, and (6) physical activity as an ascetic experience.

In one typical research study with this instrument, Corbin (1976) found that women basketball players scored highest on the ascetic scale when compared to a control group of college freshmen.

The ascetic scale refers to the satisfaction gained from stiff competition and strenuous activity.

Lerch (1976) looked at the perceptions or constructs of four female track athletes before, during, and after the season. He used projective techniques to elicit the constructs. Examples of the constructs he discovered are "I enjoy feeling exhausted" and "I will have to work hard to improve myself."

Cratty (1983), in his excellent review of the mental states of athletes, lists 16 thoughts that he concludes might be in the mind of most athletes. These thoughts are about the fear of competition, one's own ability, the opponent's ability, the rewards involved, winning and losing, tactics and skills, and an interest in regulation of one's physiological processes.

Self-Verbalizations in Athletic Domain

The comparison of the psychological traits of different athletes and nonathletes has received considerable attention in the sports psychology literature (Martens, 1975; Morgan, 1978). Recently, the self-verbalizations and mental activities of athletes have become increasingly important to sports psychologists (Cratty, 1983; Mahoney, 1979). Sports psychologists and coaches are interested because they believe that the knowledge of cognitive factors will ultimately enable them to help athletes improve their performance. Several theories and practices are in vogue, but little extensive research has been conducted with different types of athletes and their problems.

The self-talk of athletes is probably familiar to persons who take their sports participation seriously or to anyone who faces tough challenges and has to deal with competitive anxiety and issues of self-confidence, concentration, or fear of injury. The following discussion presents a few of the cognitive themes in current sports psychology. These themes are self-efficacy, causal attribution, attention focusing or concentration, mental coping strategies for anxiety, imaginary rehearsal, and level of arousal. They all involve varying degrees of self-talk and thought.

The theory of self-efficacy refers to the belief in one's own effectiveness (Bandura, 1977). It is believed that athletic performance is related to how the athletes assess their own ability and what they tell themselves they can or cannot do. Ness and Patton (1979) asked 48 male volunteers to perform the bench press. Several of the volunteers were unaware of the actual poundage, while others believed the poundage was either lighter or heavier than it actually was. The group that performed best had been given an understatement of the poundage. In line with this finding, Mahoney (1979) suggests that the self-efficacy of the athlete might be modifiable by direct reassurance from the coach, imaginal rehearsal of the desired performance, and the practicing of self-efficacious monologues prior to performance.

The causal attribution theory states that the explanation athletes give themselves about their success or failure influences their subsequent performance (Cratty, 1981). It is proposed

that realistic reasons for success and failure are more likely to result in optimal performance.

Successful athletic performance has been related to the ability of athletes to focus their attention and to concentrate on the activity at hand. It is further believed that the athlete's anxiety can either hinder or promote this concentration (Nideffer, 1978). Thought-stopping is one technique that has been utilized along with relaxation exercises to control the counterproductive anxiety (Zeigler, 1978). The coach or psychologist trains athletes to engage in their negative or counterproductive thoughts and to then immediately to counter the negative thought with a positive one. Finally, the athletes are trained to engage in a task-oriented thought.

Runners have been found to concentrate in different ways. Morgan and Pollock (1977) found that many marathoners engage in dissociative thinking to keep their mind off their pain. They think about building a house or writing letters to friends, and so on. However, it was observed that the most successful runners engage in associative thinking, that is, concentrating on their own body reactions and talking to themselves about how best to perform. They confront their pain and narrow their attention.

Mental practice of a skill, or "imaginal rehearsal" as it is also called, is practiced by several types of athletes prior to sports competition in an effort to enhance their actual performance. This activity may involve the athletes imagining themselves, for example, skiing down a trail or jumping hurdles (from either inside

or outside their own bodies), or verbalizing directions to themselves, or doing a combination of visualization and self-talk. They can also imagine a model correctly performing the skill.

There have been some reports of successful results from imaginal rehearsal (Suinn, 1972; Suinn, 1977); nevertheless, the effectiveness of this cognitive strategy is equivocal (Cratty, 1983; Mahoney, 1977). One problem in assessing this procedure has to do with the variety of ways a person can rehearse.

The role of arousal in athletic performance has received a great deal of attention (Landers, 1978). Arousal refers to the intensity level experienced by athletes before and during an athletic contest. This energy can be inferred from heart rate and muscle tension. It is assumed that different types of athletes will require different levels of arousal to perform successfully.

To establish the importance of arousal, Shelton and Mahoney (1978) found that weight lifters who were told to "psych" themselves, i.e., arouse themselves, outperformed a control group on a measure of grip strength. The weightlifters' psyching strategies involved a combination of self-efficacy statements, imaginal rehearsal, self-generated arousal, and attentional focus.

Several studies with sky divers and gymnasts suggest that successful performers usually peak in their level of arousal before the actual performance while the others maintain their level of arousal throughout the performance (Fenz, 1975; Mahoney & Avenier, 1977). After a while, successful athletes are more likely to self-verbalize about what they need to keep in mind to perform

well; less successful athletes are more likely to continue to focus on their anxiety.

Gallwey (1976) in Inner Tennis: Playing the Game disavows the efficacy of self-talk. He recommends that players stop or turn off their self-instructions and negative evaluations. He recommends quieting the mind and substituting increased nonjudgemental awareness of what is happening for the usual self-talk. His orientation is basically a nonevaluative perceptual approach.

The current study focused on how low exercisers differ from medium and high exercisers in what they say to themselves to encourage or discourage themselves from exercising. This study is unique in that it attempts to assess the specific thoughts or self-statements that occur to a person when thinking about engaging (or not engaging) in physical exercise or sports prior to the activity. The self-statements that encourage exercise are called proexercise or positive self-statements; the self-statements that discourage exercise are called antiexercise or negative self-statements.

This study was not about the self-talk that occurs while a person is engaged in exercise or sports or, for that matter, the self-talk that occurs later. The purpose of this study was to determine how low, medium, and high exercisers differ in their self-talk about engaging in exercise. The researcher's interest in this study was to learn about the self-verbalizations of exercisers versus nonexercisers. It was assumed that even if self-talk was related to exercise behavior, the self-talk of

high and medium exercisers could not necessarily be distinguished since both groups were actively involved in exercise. It was further assumed that the self-talk of both high and medium exercise groups would differentiate them from the very low or nonexercise groups. The hypotheses follow.

Hypotheses

1. Low, medium, and high exercisers will show the following patterns regarding proexercise self-verbalizations:

- (a) The high and medium exercisers will engage in positive self-statements more frequently than will low exercisers.
- (b) The high and medium exercisers will engage in positive self-statements that have a greater influence over their exercise behavior than will low exercisers.
- (c) The high and medium exercisers will engage more frequently in positive self-statements that influence them than will low exercisers.

2. Low, medium, and high exercisers will show the following patterns regarding antiexercise self-verbalizations:

- (a) The low exercisers will engage in negative self-statements more frequently than will high or medium exercisers.
- (b) The low exercisers will engage in negative self-statements that have a greater influence over

their exercise behavior than will high or medium exercisers.

- (c) The low exercisers will engage more frequently in negative self-statements that influence them than will high or medium exercisers.

CHAPTER II

METHOD

Subjects

The subjects were students taking graduate and undergraduate courses in the colleges of Liberal Arts, Nursing, and Education at The University of Tennessee, Knoxville during the summer of 1982. Although 200 students volunteered to participate, only 175 students completed the study.

Approximately 100 students received extra credit from their instructors for their participation; of these, 25 were used as a reliability sample.

Instruments

Two instruments were designed especially for this study: the Physical Activity Questionnaire and the Self-Talk and Exercise Questionnaire. Together, these take an average of 35-45 minutes to complete.

Physical Activity Questionnaire. The purpose of this questionnaire was to assess the exercise behavior of subjects during a typical week during the warm and cold seasons of the year. Therefore, this questionnaire lists 66 exercise and sports activities and asks the subjects to state the number of times per week and the total number of hours, or parts thereof, that they engage in any activity on the list during the warm and cold seasons

of the year. The list of activities is intended to be comprehensive, but a subject may nevertheless fill in activities not listed in the questionnaire. (See Appendix I for the Physical Activity Questionnaire.)

Many of the activities listed in the questionnaire have been previously assigned MET units by experts in the health field, as is shown in Table 1. Other activities that are not on this list of MET levels were assigned MET values based on their similarity to the items presented. Generally speaking, METS refer to the amount of oxygen consumed by the body during exercise divided by the amount of oxygen consumed during rest (American College of Sports Medicine, 1980). Vigorous exercise will have higher MET units than passive exercise.

In Guidelines for Graded Exercise Testing and Exercise Prescription (American College of Sports Medicine, 1980), the authors provide the following description of METS:

One MET is the equivalent of the resting oxygen consumption (VO_2) which is approximately $3.5 \text{ ml/kg}\cdot\text{min}$ ($1 \text{ MET} = 3.5 \text{ ml/kg}\cdot\text{min}$). The MET level during exercise is determined by dividing the exercise metabolic rate, represented by the exercise VO_2 , by the resting metabolic rate, represented by the resting VO_2 . (p. 137)

It is understandable that running has a higher MET value than walking; tennis singles has a higher MET value than tennis doubles; and bicycling at 10 miles an hour has a higher MET value than bicycling at 3 miles an hour and so on.

Four independent variables were established from this questionnaire: Winter hours, Summer hours, Winter MET hours, and

TABLE 1
MET LEVELS

Activity	MET Level	Activity	MET Level
Archery	3	Horseshoe pitching	3
Badminton		Hunting	5
Singles	8	Jogging or running	
Doubles	5	Slow	7
Basketball		Moderate	9
Half court	6	Fast	11
Full court	8	Lawn work	
Bicycling		Push mower	6
Slow	4	Power mower	3
Moderate	6	Riding mower	2
Fast	8	Raking, digging	4
Boating		Lifting/carrying objects	
Row or paddle	5	Light (20 pounds)	3
Sail	4	Moderate (20-44 pounds)	5
Bowling	3	Heavy (45 pounds)	7
Calisthenics		Mountain climbing	7
Stretching	4	Skating	7
Strength	5	Skiing	
Dancing		Cross country	8
Aerobic	8	Downhill	6
Social	4	Water	6
Square	6	Softball or baseball	5
Fishing		Swimming	
Bank, boat, or ice	3	Recreational	4
Wading	5	Competitive	7
Football, touch	8	Table tennis	4
Gardening	4	Tennis	
Golf		Singles	7
Electric cart	2	Doubles	4
Pull cart	3	Volleyball	
Carry clubs	4	Recreational	3
Handball, paddleball, or squash		Competitive	5
Singles	10	Walking	
Doubles	8	Slow	4
Hiking	6	Fast	6
Horseback riding	4	Other, specify	

Adapted from American College of Sports Medicine (1980), Guidelines for Graded Exercise Testing and Exercise Prescription.

Summer MET hours. The value of the Winter hours variable was a total of all exercise hours reported for the cold season of the year. To compute the value for the Winter MET hours variable, the experimenter first multiplied the hours reported for a given activity by the MET value assigned to that activity and then added the resulting products for the various activities. The Summer hours variable was computed in the same way as the Winter hours variable and the Summer MET hours variable in the same way as the Winter MET hours variable.

Self-Talk and Exercise Questionnaire. This questionnaire consisted of 63 statements that people have been found to tell themselves subvocally to encourage or discourage themselves from exercising. Out of the 63 statements, 37 statements would ordinarily encourage and 26 statements would ordinarily discourage a person from engaging in exercise. These statements came from both the responses to the open-ended questions and the in-depth interviews administered by this researcher during the development of this questionnaire. (See Appendix II for the Self-Talk and Exercise Questionnaire.)

During the development of this questionnaire, 80 undergraduate students in educational psychology responded to two open-ended stimulus questions asking them to describe what they said to themselves to encourage or discourage their participation in exercise and sports. (See Appendix III for Stimulus Questions.) Typical responses were: "I want to feel good"; "I want to be able to fit into my clothes"; "I'll do it tomorrow."

Furthermore, this researcher conducted in-depth interviews with five graduate students about their self-verbalizations relative to engaging in exercise. A greater variety and quantity of self-verbalizations were elicited from these interviews than had been for the open-ended questions.

The self-verbalizations, from both the open-ended questions and the in-depth interviews, were presented to 10 well-educated friends of the experimenter who were asked to give suggestions about the clarity and redundancy of the items. The suggestions they gave the experimenter led to several changes in wording and the elimination of several self-statements.

Once the self-statements for the questionnaire had been selected, each subject was asked to respond to two questions about each item. The first question asked the subjects to consider how frequently they made each self-statement. The second question asked the subjects to consider the extent to which each self-statement encouraged or discouraged them from engaging in exercise. From their responses to these questions, three dependent variables were established: a Frequency variable, an Influence variable, and a Combined Frequency-Influence variable.

To answer the question about how often they think each particular thought, subjects were asked to choose either Never, Rarely, Sometimes, or Frequently. A Never response was assigned a zero value; Rarely, a one; Sometimes, a two; and Frequently, a three (Frequency variable).

To answer the question about the degree of influence the particular thought had on their exercise behavior, subjects were asked to choose either Neutral, Mildly, or Greatly. A Neutral response was assigned a zero value; Mildly, a one; and Greatly, a two (Influence variable).

The third dependent variable, the Combined variable, was based on the products of the Frequency and the Influence scores. For example, a subject who responded to any statement by choosing Sometimes (2) for Frequency and Greatly (2) for Influence would have a Combined score of 4. The Combined variable was considered to be a more meaningful measure than either the Frequency variable or the Influence variable alone. Logically, the Frequency and Influence need to be viewed together. For example, one would expect frequently emitted statements with little influence to have less effect on behavior than frequently emitted statements which are influential. The Combined variable gives weight to both Frequency and Influence.

Procedure

After making prior arrangements with each class instructor, this researcher visited several classes and asked the students to participate in this study. She described the voluntary nature of participation and suggested that the students might profit from taking part in this study by becoming more self aware. She then asked the volunteers to read and sign the Informed Consent Statement (see Appendix IV). Finally, subjects were asked to complete the

Physical Activity Questionnaire before completing the Self-Talk and Exercise Questionnaire.

For the most part, the volunteers in each class were allowed to take home the questionnaire and return it at the beginning of the next class meeting. About 50 subjects were given permission by their instructor to complete the questionnaires during class time. One week after the first administration, 25 of the original subjects in an education class were presented with the identical questionnaires and asked to respond to them again. They were simply advised at that time that the research procedures required that they do this and were thanked in advance for their willingness to cooperate. Of the 25 questionnaires, 24 were returned and utilized.

CHAPTER III

RESULTS

Reliability of Physical Activity Questionnaire

The reliability sample consisted of 24 subjects who were tested and retested 1 week later. Using information from the Physical Activity Questionnaire, this researcher rank ordered subjects, both in the pretest and in the posttest groups, according to the four independent variables: (1) Winter exercise hours, (2) Summer exercise hours, (3) total MET hours in Winter, and (4) total MET hours in Summer. The rank ordered groups of 24 each were then divided into three equal thirds to become the low, medium, and high groups for Winter hours, Winter MET hours, Summer hours, and Summer MET hours. A comparison was then made to find out the percentage of agreement pre and post relative to a subject's position in one of the three groups for each of the four variables of Winter hours, Summer hours, Winter MET hours, and Summer MET hours.

As can be seen from Table 2, the percentage of position agreement ranged from the highest agreement of 87.5% for the Winter hours groups to the lowest agreement of 75% for the Winter MET hours groups. It is apparent from this table that subjects are not entirely consistent in their estimates of their average weekly exercise, but are consistent enough to allow us to use this instrument with relative confidence.

TABLE 2

PERCENTAGE AGREEMENT PRE AND POST POSITION OF
EXERCISERS IN EITHER LOW, MEDIUM, OR
HIGH EXERCISE GROUPS

	Winter Hours	Winter MET Hours	Summer Hours	Summer MET Hours
Low	8/8 agree (100%)	5/8 agree (63%)	8/8 agree (100%)	8/8 agree (100%)
Medium	6/8 agree (75%)	6/8 agree (75%)	5/8 agree (63%)	6/8 agree (75%)
High	7/8 agree (87.5%)	7/8 agree (87.5%)	7/8 agree (87.5%)	5/8 agree (63%)
Total	21/24 agree (87.5%)	18/24 agree (75%)	20/24 agree (83%)	19/24 agree (79%)

Composition of Low, Medium, and High Exercise Groups for
Four Independent Variables

Inasmuch as only a small percentage of subjects took the posttest, the pretest scores were used as the basis for further grouping and analyses. From the sample of 174 subjects rank ordered by the number of hours exercised during a typical week, three groups of exercisers for the Winter and Summer hours conditions were created by dividing the sample in the following manner: 1-25 percentile (low group); 37.5-62.5 percentile (medium group); 75-100 percentile (high group). The purpose of the cutoffs, rather than simple thirds cutoffs, was to minimize the overlapping of adjacent groups which occurs when a sample is divided into equal thirds.

In the case of the Winter MET hours and Summer MET hours independent variables, the exercisers were initially divided according to established health recommendations (D. Franks, personal communication, December 1982). Franks considered any weekly exercise below 5 MET hours as a low or inadequate amount of exercise; between 10 and 20 MET hours as a medium or adequate amount of exercise; and above 25 MET hours as a high or more than adequate amount of exercise.

Using Franks' guidelines, there would have been only 23 out of 174 subjects in the low Winter MET hours group, and only 12 out of 174 subjects in the low Summer MET hours group. Inasmuch as this division created too few subjects in the low groups, especially in the low Summer MET hours, and a disproportionate number of subjects in both the high Winter MET hours and high Summer MET hours groups, this researcher decided to level independent variables by the

subjects' relative standing within those groups: 1-25 percentile (low), 37.5-62.5 percentile (medium), and 75-100 percentile (high) as cutoffs for Winter MET hours and Summer MET hours.

As can be observed from Table 3, after the low, medium, and high exercise groups were created, approximately 25% of the total sample was no longer included, but approximately 75% remained for further analysis. This subject attrition was due to cutoffs that were established in setting up the groups.

Range of exercise hours. The range of exercise hours varied for each independent condition of Winter hours, Winter MET hours, Summer hours, and Summer MET hours. It can readily be seen from Tables 4, 5, 6, and 7 that the subjects reported more exercise hours per week in the Summer than in the Winter and achieved more MET hours in Summer than in Winter.

The low Winter hours group ranged in exercise behavior from 0-2 hours per week, while the low Summer hours group ranged from 0-4 hours per week. The medium Winter hours group exercised 4-8 hours per week, while the medium Summer hours group exercised 7-14 hours per week. The high Winter hours group ranged in exercise behavior from 15-84 hours per week, while the high Summer hours group ranged from 23-99 hours per week.

Differences between Winter and Summer were also evident in the accumulation of MET hours. The low Winter MET hours group ranged in exercise behavior from 0-13 MET hours per week, while the low Summer MET hours group ranged from 0-27 MET hours per week. The medium Winter MET hours group ranged from 22-50 MET hours per week,

TABLE 3
NUMBER OF SUBJECTS IN EACH OF THREE EXERCISE GROUPS
BROKEN DOWN BY FOUR INDEPENDENT CONDITIONS*

	Winter Hours	Winter MET Hours	Summer Hours	Summer MET Hours
Low	44 (25%)	43 (25%)	41 (24%)	43 (25%)
Medium	45 (26%)	44 (25%)	50 (29%)	43 (25%)
High	44 (25%)	43 (25%)	43 (25%)	42 (24%)
Total	133 (76%)	130 (75%)	134 (77%)	128 (74%)

*Total sample size was 174 subjects.

TABLE 4
RANGE OF HOURS OF EXERCISE DURING A TYPICAL WEEK
IN WINTER FOR LOW, MEDIUM, AND
HIGH EXERCISERS

Groups	Range in Hours
Low exercise group	0-2 hours per week
Medium exercise group	4-8 hours per week
High exercise group	15-84 hours per week

TABLE 5

RANGE OF HOURS OF EXERCISE DURING A TYPICAL WEEK
IN SUMMER FOR LOW, MEDIUM, AND
HIGH EXERCISERS

Groups	Range in Hours
Low exercise group	0-4 hours per week
Medium exercise group	7-14 hours per week
High exercise group	23-99 hours per week

TABLE 6

RANGE OF MET HOURS DURING A TYPICAL WEEK
IN WINTER FOR LOW, MEDIUM, AND
HIGH EXERCISERS

Groups	Range in MET Hours
Low exercise group	0-13 MET hours per week
Medium exercise group	22-50 MET hours per week
High exercise group	84-325 MET hours per week

TABLE 7
RANGE OF MET HOURS DURING A TYPICAL WEEK
IN SUMMER FOR LOW, MEDIUM, AND
HIGH EXERCISERS

<u>Groups</u>	<u>Range in MET Hours</u>
Low exercise group	0-27 MET hours per week
Medium exercise group	40-75 MET hours per week
High exercise group	119-490 MET hours per week

while the medium Summer MET hours group ranged from 40-75 MET hours per week. Finally, the high Winter MET hours group ranged from 84-325 in MET hours per week, while the high Summer MET hours group ranged from 119-490.

Neither the low Winter MET hours group nor especially the low Summer MET hours group would be considered truly low if the experimenter had used Franks' recommended health cutoffs. As previously stated, he estimated 0-5 MET hours as a low exercise range whereas the low Summer MET hours group ranged from 0-27 MET hours and the low Winter MET hours group ranged from 0-13 MET hours. Also, the medium groups of Winter MET hours and Summer MET hours would be considered high exercisers using Franks' cutoffs of 10-20 MET hours as a medium range, since in both groups the exercisers scored from 22 MET hours and above.

There were 23 subjects in the Winter MET hours group who were truly low, according to Franks' cutoffs. These represented approximately 13% of the total sample and approximately 53% of the actual low Winter MET hours group. There were 12 subjects in the Summer MET hours group who were truly low using Franks' cutoffs, and these represented approximately 7% of the total sample and approximately 27% of the actual low Summer MET hours group.

Only 15 subjects in the total sample of 174 reported zero exercise hours for Winter and Winter MET hours and only seven subjects estimated zero exercise hours in Summer and Summer MET hours. The percentile cutoffs finally used in establishing the exercise groups

did not eliminate these nonexercisers from the sample used for analysis. The zero Winter and Winter MET hours exercisers represented approximately 9% of the total sample and approximately 33% of the actual low Winter hours and Winter MET hours group used for analysis. The zero Summer and Summer MET hours exercisers represented approximately 4% of the total sample and approximately 17% of the actual low Summer and Summer MET hours groups used for analysis.

In this researcher's opinion, several exercisers overstated the amount of exercise they engaged in during a typical week. The upper extreme range of 84 hours in the Winter and 99 hours in the Summer must reflect an overestimate or a mistake. These hours are extremely unrealistic and are probably impossible amounts of time for people with normal school loads to engage in exercise.

The use of a self-report instrument to measure exercise behavior probably inflated the hours reported by some individuals, but there is no evidence to suggest that high exercisers were rating themselves low and low exercisers were rating themselves high. The basic relationships do not appear to have been invalidated by the use of a self-report instrument. A more direct measure of behavior was not considered practical in the current study. However, in future research of this type, exercise could be assessed by using observers to monitor the exercise behavior of the subjects, by asking the subjects to log their own exercise behavior, or requesting that the subjects wear electronic devices to measure their exercise participation.

Reliability of Self-Talk and Exercise Questionnaire

The reliability sample consisted of 24 subjects who were tested and retested 1 week later. Pearson Product Moment Correlation Coefficients were used to determine the consistency of the 24 pretest and posttest responses to each of the 63 self-statements. The following relationships were examined: (1) the correlation pre and post of responses to the Frequency variable, and (2) the correlation pre and post of responses to the Influence variable.

On the Frequency dimension, 28 self-statements had a correlation coefficient of .70 or above with, as it turned out, a level of significance of .0003 or above. Of these, 13 were positive or proexercise self-statements (see Table 8). The other 15 were negative or antiexercise self-statements (see Table 9).

On the Influence dimension, nine self-statements had a correlation coefficient of .70 or above with a .0001 level of significance. Of these, eight self-statements were positive or proexercise, and one self-statement was negative or antiexercise (see Table 10).

From Table 11, it can be observed that six self-statements demonstrated reliability on both the Frequency and the Influence variables. These were the positive or proexercise self-statements 9, 41, 59, 60, and 62, and the negative or antiexercise self-statement 56.

These six self-statements became the Combined variable when Frequency was multiplied by Influence. The Combined variable was considered more important to investigate than either the Frequency

TABLE 8
RELIABILITY COEFFICIENTS FOR FREQUENCY VARIABLE FOR PROEXERCISE SELF-STATEMENTS

Statement Number	Positive (Proexercise) Self-Statements	Pearson r	Significance
9	I can find the time to do it, if I plan carefully.	.70	.0003
17	I want to have cardiovascular fitness.	.76	.0001
23	I like the excitement or thrill of the activity.	.80	.0001
28	I like the opportunity the activity affords me to improve my performance and master new skills.	.70	.0001
33	I'll improve my physical appearance.	.81	.0001
37	I can find activities that will suit me--if I make the effort.	.75	.0001
41	I want to lose weight or maintain my weight.	.76	.0001
48	I'll feel worthwhile and improve my self-concept because I take care of myself.	.75	.0001
50	I like the status that is associated with being good at a sport.	.72	.0001
58	I'm going to ignore the bad weather conditions.	.73	.0001
59	I enjoy being on a team.	.82	.0001
60	I like feeling the flow of my movement--that is, using my body well and being coordinated--while being engaged in the activity.	.86	.0001
62	I want to have energy, strength, muscle tone, or flexibility.	.85	.0001

TABLE 9
RELIABILITY COEFFICIENTS FOR FREQUENCY VARIABLE FOR ANTIEXERCISE SELF-STATEMENTS

Statement Number	Negative (Antiexercise) Self-Statements	Pearson r	Level of Significance
5	I don't like the pressure to win in some sports.	.71	.0002
13	I would rather be doing something else.	.80	.0001
15	I don't like being physically active and participating in exercise and sports.	.70	.0001
18	The weather is unsuitable. (Either it is too cold, too hot, or it is damp and raining.)	.70	.0001
25	I don't like how my body feels during active physical exercise--breathless, sweaty, tired, cold, hot, or sore.	.76	.0001
30	I am not concerned about living a long life.	.82	.0001
31	I get enough exercise from my regular activities.	.82	.0001
35	I don't believe regular exercise is necessary for me.	.74	.0001
42	I don't know how to go about choosing suitable activities.	.70	.0002
44	I'll do it tomorrow.	.86	.0001
45	I'm too tired now, or just don't feel up to it.	.77	.0001
52	I'm generally too busy.	.75	.0001
55	I have no self-discipline to keep it up, so why start?	.73	.0001
56	I don't have the right body to exercise. (I'm unathletic, fat, poorly coordinated, or too weak.)	.80	.0001
63	I don't want people to notice that I am not very good at the activity, or I'm self-conscious.	.78	.0001

TABLE 10

RELIABILITY COEFFICIENTS FOR INFLUENCE VARIABLE BROKEN DOWN BY PROEXERCISE AND ANTIEXERCISE
SELF-STATEMENTS

Statement Number	Self-Statements	Pearson r	Level of Significance
<u>Proexercise (Positive)</u>			
7	I can work out my anger or frustration	.72	.0001
9	I can find the time to do it if I plan carefully.	.81	.0001
20	I'll feel less tired.	.70	.0002
41	I want to lose weight or maintain my weight.	.89	.0001
47	I'll be sharper, more alert, and better able to work efficiently.	.74	.0001
59	I enjoy being on a team.	.72	.0001
60	I like feeling the flow of my movement--that is, using my body well and being coordinated--while being engaged in the activity.	.78	.0001
62	I want to have energy, strength, muscle tone, or flexibility.	.78	.0001
<u>Antiexercise (Negative)</u>			
56	I don't have the right body to exercise. (I'm unathletic, fat, poorly coordinated, or too weak.)	.81	.0001

TABLE 11

SELF-STATEMENTS WITH RELIABILITY COEFFICIENTS OF .70 OR ABOVE ON BOTH
FREQUENCY AND INFLUENCE*

Statement Number	Self-Statements	Pearson r (Frequency)	Pearson r (Influence)
<u>Proexercise (Positive)</u>			
9	I can find the time to do it if I plan carefully.	.70	.81
41	I want to lose weight or maintain my weight.	.76	.89
59	I enjoy being on a team.	.82	.72
60	I like feeling the flow of my movement--that is, using my body well and being coordinated--while being engaged in the activity.	.86	.78
62	I want to have energy, strength, muscle tone, or flexibility.	.85	.78
<u>Antiexercise (Negative)</u>			
56	I don't have the right body to exercise.	.80	.81

*In every case the level of significance is at least .0003 or beyond.

or Influence variable alone because the impact of self-verbalizations on behavior would largely seem to be a function of both frequency and influence. For example, it is speculated that a high frequency self-statement having little influence would probably affect one's exercise behavior less than a high frequency self-statement that has great influence. Likewise, a low frequency self-statement would probably have more effect on exercise behavior if it were highly important and crucial to the person than if it were unimportant. Therefore, the Combined variable was assumed to provide more useful information than either the Frequency variable or the Influence variable alone.

Additionally, there were 22 self-statements rated for Frequency and 24 self-statements rated for Influence with test-retest levels of significance at .05 or beyond, but with reliability coefficients below .70. These self-statements were not used in this study nor included in the tables presented. Two-thirds of the self-statements included in this study had reliability coefficients between .70 and .79 on either Frequency, Influence, or both; one-third of the self-statements had a reliability coefficient between .80 and .89 on either Frequency, Influence, or both.

Composite dependent variables. The Frequency, Influence, and Combined variables were sub-divided into the following dimensions:

Frequency Positive--A composite or simple average per subject of responses to the Frequency dimension for the proexercise self-statements 9, 17, 23, 28, 33, 37, 41, 48, 50, 58, 59, 60,

and 62. (These all had reliability of .70 or above on the Frequency dimension.)

Frequency Negative--A composite or simple average per subject of responses to the Frequency dimension for antiexercise self-statements 5, 13, 15, 18, 25, 30, 31, 35, 42, 44, 45, 52, 55, 56, and 63. (These all had reliability of .70 or above on the Frequency dimension.)

Influence Positive--A composite or simple average per subject of responses to the Influence dimension for proexercise self-statements 7, 9, 20, 41, 47, 59, 60, and 62. (These all had reliability of .70 or above on the Influence dimension.)

Influence Negative--Responses to Influence dimension for self-statement 56. (This self-statement is the only negative or antiexercise one with reliability of .70 or above on the Influence dimension.)

Combined Positive--A composite or simple average of the Combined (Frequency times Influence) for the proexercise self-statements 9, 41, 59, 60, and 62. (These were the five self-statements with established reliability of .70 or above on both Frequency and Influence.)

Combined Negative--The Combined (Frequency times Influence) for antiexercise self-statement 56. (This self-statements is the only negative or antiexercise one with reliability of .70 on both the Frequency and Influence dimension.)

Relationship between Self-Verbalizations and Exercise

The responses of the previously established low, medium, and high Winter hours, Summer hours, Winter MET hours, and Summer MET hours groups to the self-statements of the Self-Talk and Exercise Questionnaire were then compared using only those self-statements with a reliability of .70 and above and a level of significance of at least .05, as previously discussed.

Specifically, a one-way ANOVA was used to compare the group means of the low, medium, and high exercise groups during Winter hours, Summer hours, Winter MET hours, and Summer MET hours conditions to determine if a significant difference existed between them. Scheffé, a multiple comparison procedure, was further used to identify precisely where significant differences between groups were located.

The one-way ANOVA was applied to the Frequency Positive, Frequency Negative, Influence Positive, Influence Negative, and to the Combined Positive and Combined Negative. The six self-statements 9, 41, 56, 59, 60, and 62, with established reliability on both Frequency and Influence, were also individually examined on their Combined scores (Frequency times Influence). These six were selected for individual analysis because they were considered to be more potent self-statements than those that had established reliability only for Frequency or Influence.

Winter hours. For Winter hours (see Table 12), the one-way ANOVA yielded no significant differences between the group means

TABLE 12
ANOVAS ON COMPOSITE DEPENDENT VARIABLES AND COMBINED INDIVIDUAL SELF-STATEMENTS FOR WINTER HOURS CONDITION

Composites	Group Means (Simple Average per Subject)			F	Level of Significance
	High	Medium	Low		
Frequency Positive	1.9052	1.7635	1.6417	2.49	
Frequency Negative	0.8697	1.1538	1.1323	3.76*	.02
Influence Positive	1.0216	0.9778	0.8807	1.09	
Influence Negative	-0.25581	-0.26667	-0.29545	.03	
Combined Positive	3.0924	2.8311	2.3591	3.13*	.04
Combined Negative	-0.37209	-0.28889	-0.40909	.08	
Individual Self-Statements on Combined Variable (Frequency times Influence)					
9	1.5455	1.7556	1.4545	.28	
41	4.2222	4.1591	3.1136	3.01*	.05
56	-0.37209	-0.28889	-0.40909	.08	
59	1.6429	0.8889	1.7273	2.36	
60	3.3721	2.8444	2.1136	3.04*	.05
62	4.5909	4.4444	3.3864	4.20*	.01

*p < .05

Note: Combined Negative and Combined 56 are identical

of low, medium, and high exercisers for the dependent variables Frequency Positive, Influence Positive, Influence Negative, Combined Negative, and the Combined individual self-statements 9, 56, and 59. The trend of the mean scores was not in the expected direction for the Combined Negative and the Combined individual self-statements 9, 56, and 59. The trends were in the expected direction for Frequency Positive, Influence Positive, and Influence Negative.

The one-way ANOVA established that there were significant differences between the group mean scores for Frequency Negative, Combined Positive, and the Combined individual self-statements 41, 60, and 62. The trend was in the expected direction for all of these variables with the exception of Frequency Negative. In the case of Frequency Negative, the medium group emitted more negatives than the low group; nevertheless, the high group emitted fewer negative self-statements than the low group, which is the expected direction. The Scheffé multiple comparison procedure identified the following specific group differences:

<u>Variable</u>	<u>Groups that Differ</u>
Frequency Negative-----	No differences*
Combined Positive-----	High and low
Combined self-statement 41-----	High and low
Combined self-statement 60-----	No differences*
Combined self-statement 62-----	High and low

*Means not far enough apart to be able to ascertain which specific groups significantly differed from each other.

Winter MET hours. For Winter MET hours (Table 13), the one-way ANOVA established that the group means of the low, medium, and high exercise group were not significantly different for the variables Influence Negative, Combined Negative, and the Combined individual self-statements 9 and 56; the overall trends were not in the expected direction for any of these, although in every case the low and high group differences were in the expected direction.

The one-way ANOVA established that there were significant differences between the group mean scores for Frequency Positive, Frequency Negative, Influence Positive, Combined Positive, and Combined individual self-statements 41, 59, 60, and 62. The trend of the means was in the expected direction for all of these with the exception of the Combined self-statement 59. Here, the low group had a higher rating than the medium group, although the medium group and the high group differed in the expected direction. The Scheffé multiple comparison procedure identified the following specific group differences:

<u>Variable</u>	<u>Groups that Differ</u>
Frequency Positive-----	High and low
Frequency Negative-----	High and low
	High and medium
Influence Positive-----	High and low
Combined Positive-----	High and low

TABLE 13
ANOVAS ON COMPOSITE DEPENDENT VARIABLES AND COMBINED INDIVIDUAL SELF-STATEMENTS FOR WINTER MET HOURS CONDITION

Composites	Group Means (Simple Average per Subject)			F	Level of Significance
	High	Medium	Low		
Frequency Positive	1.9600	1.7959	1.6170	4.43*	.01
Frequency Negative	0.8232	1.1410	1.2187	7.09*	.0012
Influence Positive	1.0881	1.0298	0.8393	3.57*	.03
Influence Negative	-0.24390	-0.23810	-0.28571	.05	
Combined Positive	3.2492	2.8429	2.2500	5.77*	.004
Combined Negative	-0.24390	-0.21429	-0.40476	.22	
Individual Self-Statements on Combined Variable (Frequency times Influence)					
9	1.7381	1.9524	1.2195	1.50	
41	4.2857	4.2143	2.9524	4.15*	.01
56	-0.24390	-0.21429	-0.40476	.22	
59	2.0250	0.8095	1.7381	3.92*	.02
60	3.3659	2.8810	1.9762	3.72*	.02
62	4.6905	4.3571	3.3333	4.63*	.01

*p < .05

Note: Combined Negative and Combined 56 are identical

Combined self-statement 41-----High and low
 Combined self-statement 59-----High and medium
 Combined self-statement 60-----High and low
 Combined self-statement 62-----High and low

Summer hours. For Summer hours (see Table 14), the one-way ANOVA established that the group means of the low, medium, and high exercisers were not statistically different for the dependent variables Frequency Positive, Influence Positive, Influence Negative, Combined Positive, Combined Negative, and the Combined individual self-statements 9, 41, 56, 59, 60, and 62. The trend of the mean values was not in the expected direction for Influence Negative, Combined Positive, Combined Negative, and Combined individual self-statements 9, 56, and 59. The trend was in the expected direction for Frequency Positive, Influence Positive, and Combined individual self-statements 41, 60, and 62.

The one-way ANOVA did establish that the group means of the variable Frequency Negative were significantly different. The trend of the mean values was in the expected direction. In this case, the high exercisers had the lowest mean score and the low exercisers had the highest score for this negative variable.

The Scheffé multiple comparison procedure identified the following group differences:

<u>Variable</u>	<u>Groups that Differ</u>
Frequency Negative-----	High and low

TABLE 14
ANOVAS ON COMPOSITE DEPENDENT VARIABLES AND COMBINED INDIVIDUAL SELF-STATEMENTS FOR SUMMER HOURS CONDITION

Composites	Group Means (Simple Average per Subject)			F	Level of Significance
	High	Medium	Low		
Frequency Positive	1.7955	1.7455	1.6808	.42	
Frequency Negative	0.8821	1.0841	1.1740	3.33*	.03
Influence Positive	1.0283	0.9350	0.0917	.42	
Influence Negative	-0.38095	-0.42000	-0.17073	1.23	
Combined Positive	3.0434	2.6300	2.6415	1.12	
Combined Negative	-0.47619	-0.70000	-0.12195	1.28	
Individual Self-Statements on Combined Variable (Frequency times Influence)					
9	1.6047	1.9000	2.0000	.42	
41	4.3256	3.7200	3.4634	1.30	
56	-0.47619	-0.70000	-0.12195	1.28	
59	1.6829	1.0000	1.5954	1.53	
60	3.2927	2.6531	2.4146	1.39	
62	4.2093	3.9200	3.7317	.49	

*p < .05

Note: Combined Negative and Combined 56 are identical

Summer MET hours. For Summer MET hours (see Table 15), the one-way ANOVA established that the group means of the low, medium, and high exercise groups were not significantly different for any of the dependent variables tested. The trend of the mean values was not in the expected direction for Influence Positive, Influence Negative, Combined Negative, and Combined individual self-statements 9, 56, and 59. The trend of the mean values was in the expected direction for Frequency Positive, Frequency Negative, Combined Positive, and Combined individual self-statements 41, 60, and 62.

TABLE 15
ANOVAS ON COMPOSITE DEPENDENT VARIABLES AND COMBINED INDIVIDUAL SELF-STATEMENTS FOR SUMMER MET HOURS CONDITION

Composites	Group Means (Simple Average per Subject)			F
	High	Medium	Low	
Frequency Positive	1.8654	1.8454	1.7006	1.13
Frequency Negative	0.9075	1.0590	1.1319	1.92
Influence Positive	0.99626	0.96221	0.96802	.06
Influence Negative	-0.31707	-0.32558	-0.16279	.53
Combined Positive	3.0492	2.7372	2.7047	.73
Combined Negative	-0.46341	-0.65116	-0.16279	.83
Individual Self-Statements on Combined Variable (Frequency times Influence)				
9	1.6905	2.0000	1.7143	.30
41	4.3095	3.6279	3.5349	1.15
56	-0.46341	-0.65116	-0.16279	.83
59	1.6000	1.1395	1.8605	1.20
60	3.2750	2.9048	2.5349	.92
62	4.2619	4.0698	3.8605	.36

Note: Combined Negative and Combined 56 are identical

CHAPTER IV

DISCUSSION

Findings

Differences between low, medium, and high exercisers. A major finding of this study is that high exercisers and low exercisers do differ in what they say to themselves about engaging in exercise. This difference is primarily apparent during the winter months. The amount of exercise a person engages in appears to have a relationship to the content of the person's self-talk about engaging in exercise. Under certain conditions, high exercisers are, as we anticipated, more positive and less negative in their self-statements than low or nonexercisers.

A majority of the differences in self-talk between low and high exercisers took place during the Winter MET hours condition, with three significant differences in Winter hours and only one in Summer hours. No differences emerged in Summer MET hours.

In many instances, the hypotheses proved consistent with the overall pattern of results: high exercisers were more likely than low exercisers to use proexercise self-statements, give a higher rating to the influence of their proexercise self-statements, and give a higher rating to the combined frequency and influence of their proexercise self-statements. Consistent with our hypotheses, the low exercisers were more likely than the high exercisers to use antiexercise self-statements.

The researcher's hypothesis that the high exercisers would engage in proexercise self-statements more frequently than would low exercisers was supported in the Winter MET hours condition. The high exercisers responded to the 13 proexercise self-statements with a significantly greater average frequency than did the low exercisers.

The researcher's hypothesis that high exercisers would rate their proexercise self-statements as having a greater influence over their exercise behavior than did low exercisers was supported by the Winter MET hours condition. The high exercisers rated eight proexercise self-statements with an average rating that was higher than that of the low exercisers.

The researcher's hypothesis that the high exercisers would have a higher rating on their combined frequency and influence responses to the positive items than would the low exercisers was supported by the Winter MET hours condition. The high exercisers rated the Combined Positive and the Combined individual self-statements 41, 60, and 62 higher than did the low exercisers. This hypothesis was also supported by the Winter hours condition. High exercisers rated the Combined Positive and Combined individual self-statements 41 and 62 higher than did the low exercisers.

The researcher's hypothesis that the low exercisers would engage in negative statements more frequently than would high exercisers was supported in the Winter MET hours condition.

The high and low groups differed in their responses to 15 antiexercise self-statements. This occurred in Summer hours, too, with differences between the low and high groups in the expected direction.

The data did not support those hypotheses which indicated that the low groups would give a higher rating than the medium and high groups to the influence of antiexercise self-statements, since the groups did not differ in response to the one antiexercise self-statement in the Influence Negative category. Neither did the data support the hypothesis that the low groups would give a higher rating than the medium and high groups to the Combined (Frequency times Influence) antiexercise self-statements, since there were no significant differences in responses to the only negative Combined self-statement 56.

This researcher had also expected to find that the medium exercise groups would differ from the low exercise groups in their responses to the frequency and influence of their proexercise and antiexercise self-statements, but such did not occur. Instead, the medium group of exercisers showed significant differences from the high group during the Winter METS condition for the dependent variables Frequency Negative and Combined individual self-statement 59. The medium group engaged in a greater frequency of negative self-statements than did the high group and engaged in fewer positive self-statements that were influential than did the high group for Combined individual self-statement 59.

Varied content of self-statements. The previous section discusses how low and high exercisers differed under certain circumstances in their responses to those self-statements from the Self-Talk and Exercise Questionnaire with established reliability. The 31 self-statements that were maintained in the study have varied content for both positive proexercise self-statements and for negative antiexercise self-statements. They refer to a wide range of issues, concerns, and self-instructions which would ordinarily encourage or discourage a person from exercising.

In the case of the 13 positive or proexercise self-statements on the Frequency variable, there are several self-statements that have to do with the physical benefits of exercise such as "I want to have energy, strength, muscle tone, or flexibility"; "I want to lose weight or maintain my weight"; and "I want to have cardiovascular fitness." A psychological benefit is described by the self-statement "I'll feel worthwhile and improve my self-concept because I take care of myself." Intrinsic benefits are brought out by the self-statements "I like feeling the flow of my movement--that is, using my body well and being coordinated--while being engaged in the activity"; and "I like the excitement and thrill of the activity." A social benefit is alluded to by the statements "I enjoy being on a team" and "I like the status that is associated with being good at a sport." Finally, there are self-statements that are motivational in content such as "I'm going to ignore the bad weather" and "I can find the time to do it, if I plan carefully."

The content of the eight proexercise self-statements for the Influence variable included some previously mentioned content as

well as additional self-statements about the psychological benefits of exercise. These are: "I can work out my anger or frustration" and "I'll be sharper, more alert, and better able to work efficiently."

In the case of the 15 negative or antiexercise self-statements on the Frequency variable, the content describes both the disadvantages and reasons for not engaging in exercise. A physical disadvantage is expressed by "I don't have the right body to exercise (I'm unathletic, fat, poorly coordinated, or too weak)." A psychological argument is covered by "I have no self-discipline to keep it up, so why start?" Here we find an intrinsic reason for not engaging in exercise: "I don't like being physically active and participating in sports." A social disadvantage is expressed by the self-statement "I don't like the pressure to win in some sports." Motivation is not helped by the self-statement that says "The weather is unsuitable."

The one antiexercise self-statement for Influence Negative has been mentioned before and refers to not having the right body to exercise.

The content of the six individual self-statements with adequate reliability on both Frequency and Influence dimensions (Combined) repeats the advantages and disadvantages of exercise already described. On the positive side there were two self-statements about physical benefits, one about intrinsic benefit, one about a social benefit, and one self-statement with a motivational content.

On the negative side, the self-statement concerned a physical disadvantage previously stated.

Of the six Combined individual self-statements, only four showed significant differences between the low, medium, and high groups during either Winter or Winter MET hours. From the Winter and Winter MET hours ANOVA tables, it can be readily observed by looking at the high group results that "I want to have energy, strength, muscle tone, and flexibility" followed by "I want to lose weight" received the highest ratings from the subjects. The next highest rating was given to the self-statement "I like feeling the flow of my movement--that is, using my body well and being coordinated--while being engaged in the activity." The lowest rating of the four self-statements was in response to "I enjoy being on a team."

There were several positive and negative self-statements that were engaged in by the subjects that cannot be easily categorized. These are: "I'll improve my physical appearance"; "I'll feel less tired"; "I'm too busy"; and "I'll do it tomorrow."

In this study, proexercise and antiexercise self-statements were treated as independent phenomena. However, in many cases positive and negative self-statements are probably chained responses, so that one response is a stimulus for the other. For example, negative responses could follow positive responses. A person would ordinarily not have negative thoughts about exercise unless some proexercise thoughts encouraging exercise had occurred first.

The sequence of the positive and negative thoughts in a person's dialogue may be highly related to exercise behavior. It seems that the final self-statement in the chain would provide the setting event for either engaging in exercise or being inactive.

Another way of classifying the content of items would be a factor analytic analysis. The latter approach might identify item groupings quite different from those identified in this section.

Exercise behavior. Another finding is that in this particular sample of 174 college students, only a small percentage of students did not exercise adequately during both winter and summer months. The sample of students also reported more exercise behavior during the warm months of the year than the cold months. The experimenter had expected to find many more subjects than the 15 in Winter and Winter MET hours and the seven in Summer and Summer MET hours who engaged in no exercise. As it turned out, the majority of the subjects were exercising adequately during the entire year, especially in the summer season.

Implications

What accounts for the several significant differences in the frequency and influence of self-statements in the Winter MET hours condition and the absence of any group differences in Summer MET hours? One possible explanation is that external cues, such as the nice weather and the sight of people playing tennis and swimming outdoors, account for most exercise behavior in the warm months.

These external cues may also explain the increased amount of exercise hours reported by the subjects for the warm season of the year. In Winter and Winter MET hours, when more effort is required to deal with the environment than in the summer, it is possible that internal cues or self-statements are more important determiners of exercise behavior than they are in summer. No doubt sitting in front of a fire on a cold winter day is very reinforcing to most of us and, consequently, it will require some very compelling self-verbalizations to encourage many of us to leave the comfort to engage in physical activity.

Our Winter MET hours groups may have shown more significant differences in responses to the variables explored than the Winter hours group because in the former condition the vigor of the activity is given weight. It stands to reason that more positive self-talk and less negative self-talk would be more highly associated with MET hours exercised than a sum of just hours. High MET values require more energy and commitment than do simple exercise hours.

Although we previously have attempted to account for the lack of differences between low and high exercisers during the Summer MET hours condition, the results suggest another possible explanation. A limitation of this study is that the low Summer MET hours group were, for the most part, people who exercised adequately in the Summer and were not low exercisers according to Franks' cutoffs. It is possible that if all our subjects in the low Summer MET hours group had been truly low, using Franks' cutoffs, we might have gotten results that would have approximated the differences between groups

found during the Winter and Winter MET hours conditions. There was no way of knowing ahead of time that we would have an insufficient number of truly low exercisers and such a skewed sample.

The amount of exercise reported by our college student sample was unexpectedly high. This researcher did not foresee that the vast majority of students would be adequate exercisers since 45% of Americans do not engage in physical activity for the purpose of exercise (Insel & Roth, 1979). Of course, college students at The University of Tennessee, Knoxville have opportunities for exercise and sports participation that are not available to others. There are two Olympic-size swimming pools, athletic fields, weight rooms, and a modern track, as well as courts for volleyball, tennis, basketball, and handball that can be used by the students who pay minimal fees for these facilities. Some students have fewer responsibilities than the general public and therefore really do have more time for exercise. In addition, some sports activities seem to be associated with the dating and life-style practices of the younger unmarried students. Finally, it is to be expected that college students would have more energy to expend than do older adults and be likely to want to use this energy in physical pursuits.

Reliability issues. People are not precise in their memory of what they say to themselves about engaging in exercise. In this study, the subjects were consistent in their responses to the Self-Talk and Exercise Questionnaire less than a third of the time. This is not surprising in view of the fact that thoughts are estimated

to flash through the mind at the rate of approximately eight per second (Cratty, 1983). When we consider that self-statements about engaging in exercise are reactions to internal and external stimuli and that these stimuli are ever-changing, we would not expect high consistency between what one remembers saying to oneself from one week to the next.

For example, stiffness in the muscles, pain in the joints, a tight waist band, and feeling uncomfortably hot or cold, or feeling energetic represent some typical internal cues that vary from week to week. On the other hand, noticing people jogging, reading about the need for exercise, stepping on the bathroom scales, and hearing about a friend's weight loss are some typical externally generated cues that are not consistently in the environment.

An alternative method to the one used to assess self-statements for this study would have been to use situational referents for the self-statements. Providing situational cues (e.g., "It's raining outside. . .," "You have a lot of work to do . . .," "Your friend asks you to go exercise . . .") might have assisted subjects in recalling their self-statements. However, it is very unlikely that we could have anticipated all the situational cues for any particular subject. Thus, providing self-statements that were not situationally bound was probably more effective in tapping a greater variety of self-statements across subjects than the situational approach would have been.

We have been assuming that it is the self-statements that people remember with a fair degree of accuracy that control their regular exercise behavior. Therefore we have looked only at the self-statements with a fairly high degree of stability in this study. It may be that the fleeting self-verbalizations also affect behavior, but they were not analyzed in this research.

The subjects were not precise in stating the amount of their exercise from pretest to posttest, although they were fairly consistent in whether they exercised a lot or a little. Perhaps this is so because the exercisers did not have a fixed, unchanging exercise schedule each week and they therefore reported in the pretest and posttest administrations of the Physical Activity Questionnaire their most recent experiences.

It seems that providing 66 choices of exercise and sports activities may have tempted some of the subjects to report on activities that were not part of their typical pattern of exercise but rather were activities that they engaged in only once in a while. Some subjects probably overestimated their exercise behavior because exercise can be viewed as a desirable endeavor and they wanted to "look good."

Recommendations

A strong recommendation is that in any future studies similar to this, the researcher initiate the study by finding groups of low, medium, and high exercisers that closely conform to the cutoffs for low, medium, and high groups recommended by Franks. This study

would have been stronger if the groups had not been artificially created by percentage cutoffs.

This researcher recommends that the minus and plus choices on the Influence variable be eliminated. They were confusing to several subjects who rated the Influence incorrectly. There would be an advantage to rewording the questionnaire so that minus and plus choices are not required. This researcher recommends that a revised Self-Talk and Exercise Questionnaire present a wider range of choices for responding to the Influence variable. The subjects in this study could choose only 0, +1, +2, or -1 and -2. Higher reliability might be achieved if more options were available. There were only eight proexercise and one antiexercise self-statements for Influence that had adequate reliability in this study. The Frequency choices ranged from 0-3 and Influence should provide the same range of choices.

In any future studies, this researcher would revise the Self-Talk and Exercise Questionnaire to include only self-statements with established reliability of .70 and a level of significance of .05 or below. This would shorten the questionnaire and decrease the time for completion. A shorter questionnaire might encourage more accurate and thoughtful responding. Equal numbers of positive and negative statements would present an advantage in analyzing the data.

Conclusion

Several studies pertaining to self-talk and exercise were reviewed in the Introduction. In these studies, patterns of self-talk were linked to the performance of related behaviors. In this study, the relationship between self-talk and exercise behavior was also observed but not during all conditions studied. Future research may be able to clarify why the relationship between self-talk and exercise behavior did not occur during the Summer MET hours condition. There undoubtedly were some self-verbalizations that were affecting exercise behavior in the summer, but they are not evident in the current data. One can only speculate about why the relationship between self-talk and exercise was not evident during both seasons of the year.

In Winter, an increase in the frequency and influence of positive self-statements and a decrease in the frequency of negative self-statements is likely to be associated with an increase in exercise behavior. In Summer, it appears that just a decrease in the frequency of negative self-statements would accompany increased exercise behavior. This is probably because of the many positive external cues during the summer months.

The Self-Talk and Exercise Questionnaire can provide health professionals with an easily obtained comprehensive assessment of an individual's cognitions about engaging in exercise. This can be used as a starting point for a discussion about engaging in exercise. The use of the questionnaire should make it possible for health professionals to tailor the counseling assistance that

they give to those individuals who need to be encouraged to exercise regularly.

Health professionals should consider that regular exercise behavior is easier to acquire in the summer, and more effort will be generally required to get people to exercise in the winter. For some recalcitrant low or nonexercisers, summer exercise would be a first step and an attainable goal.

There has been widespread publicity given to the physical benefits of exercise and not much attention to the other benefits. The low exercisers would be more likely to engage in more proexercise self-statements if they were reminded of the psychological, social, and intrinsic benefits of exercise too.

Less attention has been paid to what people say to discourage themselves from exercising. Some people do not need to be convinced that exercise is beneficial, but they do need help in overcoming some of the negative thinking that discourages them from exercising. They need help in rearranging their schedules in order to find time to exercise. They need to acquire techniques to overcome the lack of self-discipline that discourages exercise behavior. They also need help in finding exercise activities that suit their bodies and make them feel comfortable. For some people, the choice is between running around a track during lunchtime or no exercise at all. They have not explored a wide range of exercise possibilities and options. Greater effort needs to be expended in individualizing exercise prescriptions so that negative cognitions will be replaced by proexercise ones.

The rationale for this study was that self-verbalizations are . important because they are modifiable. The cognitive behavioral interventions described in the Introduction to this study would be very appropriate strategies to use with low exercisers who are interested in becoming more physically active.

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APPENDICES

APPENDIX I

PHYSICAL ACTIVITY QUESTIONNAIRE

This inventory attempts to measure adults' exercise patterns. You will be asked to think back over your exercise habits during the last several months and then indicate the amount of time you spend engaged in exercise and sports during a typical week in warm weather and a typical week in cold weather.

Please consider only activities that you do either primarily or at least partially for the purpose of exercising. If, for example, you walk somewhere because you have no other transportation, or you do housework out of necessity only, exclude these activities.

Please turn to the following pages and look at the exercise and sports activities listed. If you have spent time in any of these activities, write in the appropriate columns the number of times a week and the total amount of minutes (or hours and minutes) you spend for each activity in your typical week.

If you do not find your activities on the list, please write them in next to Other, the last item on the list, and provide the same information as described above.

We realize that you may be estimating your amount of participation, but be as accurate as you can in your estimation. It is alright to give a range for the amount of time you spend in your activities, if you prefer to do so.

Please think about a typical week in warm weather (March-October) and a typical week in cold weather (November-February) and estimate the number of times and the amount of time you spend engaged in any of the following activities.

Activity	Cold Weather		Warm Weather	
	No. of times a week	Total hours & minutes a week	No. of times a week	Total hours & minutes a week
Archery				
Badminton (singles)				
Badminton (doubles)				
Baseball				
Basketball (half court)				
Bicycling (slow)				
Bicycling (moderate)				
Bicycling (fast)				
Boating (row or paddle)				
Boating (sail)				
Bowling				
Calisthenics (stretching)				
Calisthenics (strength)				
Canoeing				
Dancing (folk or square)				
Dancing (aerobic)				
Dancing (social)				
Fishing (bank, boat, or ice)				
Fishing (wading)				

Activity	Cold Weather		Warm Weather	
	No. of times a week	Total hours & minutes a week	No. of times a week	Total hours & minutes a week
Football				
Football (touch)				
Gardening				
Golf (electric cart)				
Golf (pull cart)				
Golf (carry clubs)				
Handball (singles)				
Handball (doubles)				
Hiking				
Horseback riding				
Horseshoe pitching				
Hunting				
Jogging or running (slow)				
Jogging or running (moderate)				
Jogging or running (fast)				
Kayaking				
Lawn work (push mower)				
Lawn work (power mower)				
Lawn work (riding mower)				
Lawn work (raking, digging)				
Lifting/carrying objects				
light				
moderate				
heavy				

Activity	Cold Weather		Warm Weather	
	No. of times a week	Total hours & minutes a week	No. of times a week	Total hours & minutes a week
Mountain climbing				
Paddleball (singles)				
Paddleball (doubles)				
Racquetball (singles)				
Racquetball (doubles)				
Running (see jogging)				
Skating				
Skiing (cross country)				
Skiing (down hill)				
Skiing (water)				
Skipping rope				
Softball				
Squash (singles)				
Squash (doubles)				
Swimming (recreational)				
Swimming (competitive)				
Tennis (table)				
Tennis (singles)				
Tennis (doubles)				
Volleyball (recreational)				
Volleyball (competitive)				
Walking (slow)				
Walking (fast)				
Yoga				

Activity	Cold Weather		Warm Weather	
	No. of times a week	Total hours & minutes a week	No. of times a week	Total hours & minutes a week
Other (specify)				
Other (specify)				
Other (specify)				

APPENDIX II

SELF-TALK AND EXERCISE QUESTIONNAIRE

It is very difficult for all of us to remember our internal dialogues. On the following pages you will find some statements that other people have made to themselves relative to participation in exercise and sports. See if any of these remarks spark your memory. We are not assuming you will make identical statements; you may have similar ideas and use different words.

You will be asked to estimate how often you have made a statement and the extent to which you believe the statement affects your tendency to exercise. Please read the instructions carefully.

INSTRUCTIONS

The statements on the following pages represent what various people say to encourage or discourage themselves from exercising.

After you read each statement, I would like you to do two things:

I. Circle one of the following numbers in the space before each statement:

0 - is to be circled if you never make the statement or cannot remember ever making it.

1 - is to be circled if you make the statement rarely.

2 - is to be circled if you make the statement sometimes.

3 - is to be circled if you make the statement frequently.

II. Circle one of the following numbers after each statement:

+2 - if the statement greatly encourages you to exercise.

+1 - if the statement mildly encourages you to exercise.

0 - if the statement does not influence you.

-1 - if the statement mildly discourages you from exercise.

-2 - if the statement greatly discourages you from exercise.

For Example:

If, once in a great while, you tell yourself to exercise because it is good for your heart, and this mildly encourages you to exercise, circle the No. 1 under rarely on your left; and circle the No. +1 for mildly encourages on your right.

<u>How Often</u>				Please read the following statements and try to recall if they ever occur to you and, if so, (1) how often, and (2) how much they influence you to exercise or not to exercise.	<u>Influence</u>				
Never	Rarely	Sometimes	Frequently		Greatly Encourages	Mildly Encourages	Neutral	Mildly Discourages	Greatly Discourages
				<u>Statement</u>					
0	1	2	3	1. I want to live a long life and be healthy and fit in my old age.	+2	+1	0	-1	-2
0	1	2	3	2. I lack confidence in myself to develop new interests and skills which I need before getting involved in a physical activity.	+2	+1	0	-1	-2
0	1	2	3	3. I want to eliminate stress symptoms, or keep from having stress symptoms. (Examples include, but are not limited to, headaches, colitis, stiff neck, etc.)	+2	+1	0	-1	-2
0	1	2	3	4. I enjoy the competition involved in the sport, especially when I win.	+2	+1	0	-1	-2
0	1	2	3	5. I don't like the pressure to win in some sports.	+2	+1	0	-1	-2
0	1	2	3	6. I don't have the time today.	+2	+1	0	-1	-2
0	1	2	3	7. I can work out my anger or frustration.	+2	+1	0	-1	-2
0	1	2	3	8. I can get my mind off my worries, or get some perspective on my problems.	+2	+1	0	-1	-2
0	1	2	3	9. I can find the time to do it, if I plan carefully.	+2	+1	0	-1	-2
0	1	2	3	10. I lack appropriate resources. (These might be money for equipment, clothes, or gym memberships; or lack of partners.)	+2	+1	0	-1	-2
0	1	2	3	11. I want to be healthy and physically fit in order to avoid minor and major medical problems ranging from backaches to diabetes.	+2	+1	0	-1	-2
0	1	2	3	12. I want people to think that I am a serious person and not one who engages in frivolous pursuits.	+2	+1	0	-1	-2
0	1	2	3	13. I would rather be doing something else.	+2	+1	0	-1	-2

<u>How Often</u>				Please read the following statements and try to recall if they ever occur to you and, if so, (1) how often, and (2) how much they influence you to exercise or not to exercise.	<u>Influence</u>				
Never	Rarely	Sometimes	Frequently		Greatly Encourages	Mildly Encourages	Neutral	Mildly Discourages	Greatly Discourages
				<u>Statement</u>					
0	1	2	3	14. It will relax me; I'll feel calm, not tense.	+2	+1	0	-1	-2
0	1	2	3	15. I don't like being physically active and participating in exercise and sports.	+2	+1	0	-1	-2
0	1	2	3	16. My fatigue, or discomfort from the weather is a temporary feeling and will go away shortly after I start exercising.	+2	+1	0	-1	-2
0	1	2	3	17. I want to have cardiovascular fitness.	+2	+1	0	-1	-2
0	1	2	3	18. The weather is unsuitable. (Either it is too cold, or hot, or it is damp and raining.)	+2	+1	0	-1	-2
0	1	2	3	19. I'm in too bad a mood, or too preoccupied right now.	+2	+1	0	-1	-2
0	1	2	3	20. I'll feel less tired.	+2	+1	0	-1	-2
0	1	2	3	21. It is good for me.	+2	+1	0	-1	-2
0	1	2	3	22. I have some injuries or muscle strains which prevent me from being active now.	+2	+1	0	-1	-2
0	1	2	3	23. I like the excitement, or thrill of the activity.	+2	+1	0	-1	-2
0	1	2	3	24. Getting started is the toughest part of the activity.	+2	+1	0	-1	-2
0	1	2	3	25. I don't like how my body feels during active physical exercise--breathless, sweaty, tired, wet, cold, hot, or sore.	+2	+1	0	-1	-2
0	1	2	3	26. I don't have a safe place to engage in the activity.	+2	+1	0	-1	-2
0	1	2	3	27. I like to be noticed while involved in physical pursuits.	+2	+1	0	-1	-2
0	1	2	3	28. I like the opportunity the activity affords me to improve my performance and master new skills.	+2	+1	0	-1	-2

<u>How Often</u>				<u>Please read the following statements and try to recall if they ever occur to you and, if so, (1) how often, and (2) how much they influence you to exercise or not to exercise.</u>	<u>Influence</u>				
Never	Rarely	Sometimes	Frequently		Greatly Encourages	Mildly Encourages	Neutral	Mildly Discourages	Greatly Discourages
				<u>Statement</u>					
0	1	2	3	29. I'll enjoy doing it.	+2	+1	0	-1	-2
0	1	2	3	30. I am not concerned about living a long life.	+2	+1	0	-1	-2
0	1	2	3	31. I get enough exercise from my regular activities.	+2	+1	0	-1	-2
0	1	2	3	32. It is too much effort to arrange.	+2	+1	0	-1	-2
0	1	2	3	33. I'll improve my physical appearance.	+2	+1	0	-1	-2
0	1	2	3	34. I'll stay in shape.	+2	+1	0	-1	-2
0	1	2	3	35. I don't believe regular exercise is necessary for me.	+2	+1	0	-1	-2
0	1	2	3	36. I like experiencing a high and losing myself in the activity.	+2	+1	0	-1	-2
0	1	2	3	37. I can find activities that will suit me-- if I make the effort.	+2	+1	0	-1	-2
0	1	2	3	38. I don't like being with people I don't know well.	+2	+1	0	-1	-2
0	1	2	3	39. I am not susceptible to medical problems, so I don't need it.	+2	+1	0	-1	-2
0	1	2	3	40. I'll maintain a good mood, or feel less depressed.	+2	+1	0	-1	-2
0	1	2	3	41. I want to lose weight or maintain my weight.	+2	+1	0	-1	-2
0	1	2	3	42. I don't know how to go about choosing suitable activities.	+2	+1	0	-1	-2
0	1	2	3	43. I'll sleep better.	+2	+1	0	-1	-2
0	1	2	3	44. I'll do it tomorrow.	+2	+1	0	-1	-2
0	1	2	3	45. I'm too tired now, or just don't feel up to it.	+2	+1	0	-1	-2

<u>How Often</u>				<u>Please read the following statements and try to recall if they ever occur to you and, if so, (1) how often, and (2) how much they influence you to exercise or not to exercise.</u>	<u>Influence</u>				
Never	Rarely	Sometimes	Frequently		Greatly Encourages	Mildly Encourages	Neutral	Mildly Discourages	Greatly Discourages
0	1	2	3	46. It takes me away from my friends and/or family who do other things.	+2	+1	0	-1	-2
0	1	2	3	47. I'll be sharper, more alert, and better able to work efficiently.	+2	+1	0	-1	-2
0	1	2	3	48. I'll feel worthwhile and improve my self-concept, because I take care of myself.	+2	+1	0	-1	-2
0	1	2	3	49. It is time to do your exercise, so do it!	+2	+1	0	-1	-2
0	1	2	3	50. I like the status that is associated with being good at a sport.	+2	+1	0	-1	-2
0	1	2	3	51. It is too strenuous for my body.	+2	+1	0	-1	-2
0	1	2	3	52. I'm generally too busy.	+2	+1	0	-1	-2
0	1	2	3	53. I'll feel good.	+2	+1	0	-1	-2
0	1	2	3	54. I can solve the problems that make it difficult to be physically active, such as lack of partners, facilities, or money for equipment, etc.	+2	+1	0	-1	-2
0	1	2	3	55. I have no self-discipline to keep it up, so why start?	+2	+1	0	-1	-2
0	1	2	3	56. I don't have the right body to exercise. (I'm unathletic, fat, poorly coordinated, or too weak.)	+2	+1	0	-1	-2
0	1	2	3	57. I like the chance to be with people I know, or meet new people.	+2	+1	0	-1	-2
0	1	2	3	58. I'm going to ignore the bad weather conditions.	+2	+1	0	-1	-2
0	1	2	3	59. I enjoy being on a team.	+2	+1	0	-1	-2
0	1	2	3	60. I like feeling the flow of my movement--that is, using my body well and being coordinated--while being engaged in the activity.	+2	+1	0	-1	-2

<u>How Often</u>				<u>Please read the following statements and try to recall if they ever occur to you and, if so, (1) how often, and (2) how much they influence you to exercise or not to exercise.</u>	<u>Influence</u>				
<u>Never</u>	<u>Rarely</u>	<u>Sometimes</u>	<u>Frequently</u>		<u>Greatly Encourages</u>	<u>Mildly Encourages</u>	<u>Neutral</u>	<u>Mildly Discourages</u>	<u>Greatly Discourages</u>
0	1	2	3	61. I like the chance to get out-of-doors and enjoy the weather.	+2	+1	0	-1	-2
0	1	2	3	62. I want to have energy, strength, muscle tone or flexibility.	+2	+1	0	-1	-2
0	1	2	3	63. I don't want people to notice that I am not very good at the activity; or, I'm self-conscious.	+2	+1	0	-1	-2

APPENDIX III

STIMULUS QUESTIONS

Questions asked during the development of the questionnaire:

If you're like many individuals, you probably go through periods when you exercise regularly and other periods when you exercise very little. We are interested in determining the types of things that you say to yourself during these periods regarding physical fitness activities. To assist us in this endeavor, please answer the following questions:

- (1) During periods when you engage regularly in physical activity, what types of things do you say to yourself which encourage you to be active?
 - a.
 - b.
 - c.

- (2) During periods when you allow physical fitness activities to slide, what types of things do you say to yourself which contribute to your inactivity?
 - a.
 - b.
 - c.

APPENDIX IV

INFORMED CONSENT

I am asking you to participate as a subject in my descriptive study. The purpose of my study is to broaden our knowledge of specific life-style characteristics of college students and the nature of the specific statements people make to themselves in regard to their life-style. Your participation is voluntary, and is not required by your instructor. You may withdraw at any time without any penalty. If you do agree to be involved in this study, I will ask you to respond to several paper and pencil inventories, which will take less than one-half hour to complete. I will not ask you to identify yourself, but will assign you a number to be placed on each inventory; consequently, the responses will be completely anonymous. I anticipate completing this study during the 1982 school year. I will be glad to discuss the results with you then. I am Lorraine Ackerman-Hart, a doctoral student. I can be reached through the Educational and Counseling Psychology Department, The University of Tennessee, Knoxville (615) 974-5131.

I have read the above and am willing to participate in your study.

Name

Date

VITA

Lorraine Ackerman Hart earned a Master of Arts degree from Teacher's College, Columbia University in 1965 with a major in Psychological Foundations and Services. Her studies were supported by a federal grant from the Office of Vocational Rehabilitation.

She entered the Graduate School at The University of Tennessee in 1974 in order to pursue the doctoral degree in Educational Psychology. At the same time that she was engaged in her graduate studies, she was highly involved in parenting her two sons, Philip and Jason, now 16 and 14 years old respectively.

For the last 4 years she has been employed as a school psychologist by Grainger County Schools. Grainger County is a rural county adjacent to Knoxville, Tennessee. Previously, she worked as a vocational rehabilitation counselor in New York City and San Bernadino, California. She has also worked as a social case worker for Los Angeles County where she was able to use her knowledge of Spanish to communicate with some of her Spanish-speaking clients. She feels fortunate to have had the opportunity to live and work in different sections of the United States.

She is certified by the State of Tennessee to work as a teacher, guidance counselor, and school psychologist. She has enjoyed membership in APA, NASP, and APGA. She looks forward to finding out what it is like to have some free time to pursue interests and avocations.