THE RELATIONSHIP BETWEEN ANXIETY AND EFFORTS IN MOVEMENTS OF CHILDREN

by

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The purpose of this study was to determine what relationship, if any, exists between high anxiety in children and their movement behavior as defined by the four effort combinations of weight and flow, the four effort combinations of time and flow, and the 16 individual efforts.

A preliminary study was completed to identify subjects to be included in the investigation, and to determine the reliability of the judges selected to observe the movement of the subjects. From a pool of 44 children, 10 were selected according to scores obtained on the General Anxiety Scale for Children, the Index of Graphic Constrictiveness-Expansiveness, and on a sociometric test. The 10 children were divided into two groups of 5. One group was identified as children with denied anxiety with social ties (DAST); the other group was designated as children with denied anxiety with social isolation (DASI).

Within the main study the subjects were video-taped on two separate occasions during spontaneous play situations. The three judges, then, evaluated and rated the video-taped movements of the children for frequency and intensity of the effort combinations. The Kendall rank correlation coefficient was applied to determine the relationships existing between anxiety and movement, anxiety and the weight and flow effort combinations, anxiety and the time and flow effort combinations, and anxiety and the individual efforts.

Analysis of the data yielded the following major results: (a) statistically significant positive correlation coefficient for DAST and

the strong-bound flow effort combination; (b) statistically significant negative correlation coefficients for DAST and light-free flow, and sudden-free flow effort combinations; (c) statistically significant negative correlation coefficients for DASI and strong-free flow, and sustained-free flow effort combinations; and (d) statistically significant negative correlation coefficients for the DASI and the individual efforts of free flow and sustainment. No other significant correlation coefficients were found.

Although no cause-and-effect relationships can be stated, the following conclusions appear to be warranted within the limits of the data:

1. There is a tendency for high anxiety children who deny their anxiety with social ties (DAST) to employ strong-bound flow efforts in movement, but not to employ light-free flow or sudden-free flow effort combinations in movement.

2. There is a tendency for high anxiety children who deny their anxiety through social isolation (DASI) not to display strong-free flow, sustained-free flow effort combinations nor individual efforts of free flow and sustainment.

3. Either there is no relationship between high anxiety and other weight and flow, time and flow, and individual effort combinations, or the other effort combinations included in the study were not clearly present in the movements of the children observed.

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DEDICATION

This dissertation is dedicated to the memory of John, my father, whose love of learning and curiosity about the unknown influenced by own educational development.

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CHAPTER I

INTRODUCTION

The study of motor activity as an expressive medium through which man reveals his emotions, attitudes, and values has been applied for many years by personnel within those professions directly concerned with the understanding and interpretation of behavior. Recently empirical reports by anthropologists, sociologists, and psychologists have provided impetus to the long-standing interest in the non-verbal dimension of behavior. Labarre (1947) and Scheflen (1964), emphasizing an anthropological and sociological approach, have delved into the language of gestures and facial expressions as socializing media in society. Goffman (1963) and Guttentag (1972) have observed that subcultures within the same society differ in type and interpretation of patterns and expression. Psychologists (Freedman & Hoffman, 1967; Mehrabin & Ferris, 1967; Tomkins, 1962, 1963) have found that movement patterns, gestures, and facial expressions provide clues to the presence of feeling states. Interview and case study training materials elaborate on the non-verbal signs of tension, hostility, and withdrawal. Behaviors have been categorized and coded by Ekman and Friesen (1969), Smith and Hawkes (1972), and Tomkins (1962, 1963). Through their efforts certain types of movements of the limbs, the face, and the eyes have been linked to anxiety.

The observed overt, non-verbal signs of anxiety appear to have been a central focus in the many studies done by psychologists over the years. Levitt summarized the thought and concern given to anxiety when he said,

"anxiety is not only our official emotion; it is the primary focus of a concerted effort aimed at the improvement, and perhaps the perpetuation of human life" (Levitt, 1967, p. 2). Of the many concepts developed for anxiety, two concepts referred to as state and trait anxiety are of special interest. Gaudrey and Spielberger (1971) explained that state anxiety refers to a transitory emotional condition while trait anxiety refers to a relatively stable individual proneness towards anxiety. Individuals, characterized by high trait anxiety, perceive many objects and situations as hazardous or threatening to them. The presence of trait anxiety has been observed in children as well as in adults. The influence that anxiety has on physical and mental performance of tasks has been reported by Castaneda, Palermo, and McCandless (1956), Hill and Sarson (1966), Duffey and Martin (1973), and Smith, Irwin and Sarason (1975). The overt behavioral signs of anxiety have been observed and given descriptions such as excitement, aggression, withdrawal and frustration (Johnson & Medinnus, 1965; Levitt, 1967; Saurey & Telford, 1965; Thompson, 1962). Studies such as those cited above prepared the way for further examination of non-verbal indications of anxiety.

Research on non-verbal communication is having an impact on many fields of study in which personnel are prepared for interacting with people in a variety of settings. Education, as one field, is becoming aware of the significance of the research implications for the classroom. Within the past decade several studies on non-verbal behavior of teachers and their effect on student behavior have appeared in the literature. These studies, exemplified by Chaikin, DerLega, and Sigler (1974), Galloway

(1966), and Kounin (1958), have concluded that teachers' non-verbal behavior influenced children's overt behavior as well as their attitudes towards themselves. Although the major focus in the literature from education continues to be on non-verbal behavior accompanying the act of teaching, the non-verbal behavior of students is an important area to be studied. Most of the research on student populations is reported within the literature of education and the behavioral sciences. One of the student behaviors often encountered in those resources is associated with anxiety in the classroom and its effect on learning. Sarason, Davidson, Lightall, Waite and Rudebush (1960) have observed manifestations of anxiety under varying conditions in the school environment. They concluded that highly anxious students are quite susceptible to feedback from teachers. Performance by the anxious student is affected by his expectation of verbal and non-verbal negative feedback (Smith, Irwin & Sarason, 1975). Several authors observed that negative feedback not only influenced children's performances but also increased the chance for children to be self-disparaging and negative about themselves (Gaudrey & Spielberger, 1971; Hill & Sarason, 1966; Smith, Irwin & Sarason, 1975).

The setting and content of physical education should be of great value in the observation of non-verbal behaviors of children and overt signs of anxiety as a feeling state which may underlie behaviors involving facial gestures, bodily attitudes and similar manifestations. Studies in physical education, however, have been more concerned with personality characteristics derived from self-report paper-pencil inventories than

with the observations of motor behaviors which may accompany feeling states, particularly anxiety. Within physical education one of the few attempts made to study gross bodily movements as a non-verbal expression of the "variables of personality" was carried out by North (1972, p. 18). Her work suggested that an understanding of feeling states and traits of children could be enhanced by the observation of movement patterns which involved various effort combinations as defined by Laban (1960). Although North's work has been criticized for inadequate procedures and controls, it is suggestive of interesting and important directions for physical education researchers in non-verbal behavior. One significant outcome of exploring movement behavior may be the development of a sensitivity within physical educators toward overt expressive behaviors of anxiety as they may be revealed in motor activities. If movement patterns are found to be related to anxiety, children manifesting such patterns could be identified through direct observation of dynamic overt behaviors rather than through the indirect observation afforded by paper-pencil assessment. The purpose of this study, therefore, is to determine if there is a significant relationship between anxiety in children and their non-verbal behavior as it is reflected in selected qualities of gross bodily movement.

Statement of the Problem

The main problem to be explored is the relationship between anxiety, as defined and measured by selected children's anxiety tests, and the effort combinations in movement as identified by North. More specifically

the purpose of the study is to determine the relationships if any, existing between measured categories of anxiety and effort combinations. The relationships to be investigated are:

1. Denied anxiety with social ties (DAST) and the four weight and flow combinations of (a) strong and bound flow, (b) light and bound flow, (c) strong and free flow, and (d) light and free flow.

2. DAST and the four time and flow combinations of (a) sudden and bound flow, (b) sustained and bound flow, (c) sudden and free flow, and (d) sustained and free flow.

3. Denied anxiety with social isolation (DASI) and the four weight and flow combinations of (a) strong and bound flow, (b) light and bound flow, (c) strong and free flow, and (d) light and free flow.

4. DASI and the four time and flow combinations of (a) sudden and bound flow, (b) sustained and bound flow, (c) sudden and free flow, and (d) sustained and free flow.

5. DAST and the 16 individual efforts which are derived from the 4 effort combinations of weight and flow, and the 4 effort combinations of time and flow. They are: (a) strong, (b) bound flow, (c) light, (d) bound flow, (e) strong, (f) free flow, (g) light, (h) free flow, (i) sudden, (j) bound flow, (k) sustained, (l) bound flow, (m) sudden, (n) free flow, (o) sustained, and (p) free flow.

6. DASI and the 16 individual efforts which are derived from the 4 effort combinations of weight and flow, and the 4 effort combinations of time and flow. They are: (a) strong, (b) bound flow, (c) light, (d) bound flow, (e) strong, (f) free flow, (g) light, (h) free flow, (i) sudden, (j) bound flow, (k) sustained, (l) bound flow, (m) sudden, (n) free flow, (o) sustained, and (p) free flow.

Assumptions

The assumptions which are made for this study involve both anxiety and movement. Based on research it is assumed that trait anxiety, when found in children, is a stable personality characteristic (Cofer & Appley, 1964; Fischer, 1970; Spielberger, 1966). Children may be conscious or unconscious of their anxiety. It is assumed furthermore, that both conscious anxiety and denied anxiety can be tested, identified, and measured through the instruments to be applied. Although the conclusions derived from research on the consistency of preferred characteristics in an individual's movement profile are not definite, there does appear to be a uniqueness and consistency in the movement patterns displayed by individuals; thus assumptions are made about the consistency with which a child will move as that movement is defined by effort actions. It is assumed that the efforts, established by Laban (1960), can be observed, identified, recorded, and assessed accurately.

Definition of Terms

The definitions for the study are:

Anxiety. Anxiety is difficult to define because of its diverse nature and the variety of theories associated with the feeling state. It can be described, however, as the uneasiness or concern experienced by an individual towards an undefined source. The individual may not be consciously aware of the cause of his

discomfort but he is aware that his apprehensiveness breeds anxiety (Sarason et al., 1960).

Denied anxiety. Denied anxiety is described as the inability or lack of willingness, by the highly anxious individual, to recognize the sources of his anxiety (Wallach, Green, Lipsett, & Minehart, 1962).

Social isolation. Social isolation refers to the status of an individual who is seldom selected by others for social interactions (Wallach et al., 1962).

Social ties. Social ties refers to the status of an individual who is frequently selected by others for social interaction (Wallach et al., 1962).

Movement behavior. Movement behavior is described as gross bodily motor patterns employed by an individual.

Effort. Effort is described as "The inner impulses from which movement originates . . ." (Laban & Ullman, 1960, p. 10).

Time. Time refers to the duration of a movement. Sudden or explosive movements last for a brief period of time, whereas sustained movements occur over a longer period of time and create the sensation that the movement never ends (Stanley, 1969).

Space. Space refers to the individual's use of personal space in body movement. Direct body movements reach their goal in an undeviating manner. Flexible or indirect body movements indulge in spatial freedom (Laban & Ullman, 1966).

Flow. Flow refers to the restraint or lack of restraint governing a movement. Bound flow movements are easily stopped or checked, whereas free flow movements have "a spark-like energy which drives the movement onward" (Stanley, 1969, p. 60).

Weight. Weight refers to the amount of muscular energy used to change a body position. Light movements are characterized by a minimal use of muscular tension, whereas strong movements use maximum muscular tension (Laban & Ullman, 1966).

Scope of the Study

This study is concerned with the movement patterns of children who, according to Sarason's General Anxiety Scale for Children, have measured high levels of anxiety. The study focuses particularly upon children with high anxiety who, according to the Index of Graphic Constrictiveness-Expansiveness, deny their anxiety. A sociometric test is used in conjunction with the Index of Graphic Constrictiveness-Expansiveness to divide the children into two groups. Group one includes children who have many social ties, and group two includes children who are identified as social isolates. The movement patterns of both groups are filmed for judges to observe the four effort combinations of time and flow. The individual efforts or subcomponents of the effort combinations for weight and flow, and time and flow

are observed. The data are analysed by the Kendall rank correlation coefficient for relationships which may exist between the movement variables observed and anxiety.

Certain limitations are recognized in the study. The number of subjects is limited to 10 children subdivided into two groups of 5. While the assumption is made that trait anxiety in children can be identified, the accuracy with which the identification can be made depends upon instruments which are subject to the limitations found in verbal self-report and non-verbal expressive measures. In addition, the division of high-anxiety children into two distinct groups, tests the discriminating capacity of the measures used. The success of identifying the effort combinations displayed in movement patterns of the subjects depends upon the skill of the video-machine operator and the trained observation skills of the judges who view the video-tapes.

Significance of the Study

In the past, a number of studies have examined the relationship of personality traits to athletic participation, but few of those studies were concerned with children. Studies which did involve children examined, for example, the variable anxiety; however, such studies did not include the examination of the movement patterns of the anxiety-prone children . The current interest in the study of non-verbal communication in education and the behavioral sciences concerns the relationship of movement patterns to the presence of feeling states. The physical education setting is a natural medium for conducting such research. The purpose of this investigation is to examine the relationship between

children's anxiety and their movement patterns. The data may help to enlarge the scope of information in physical education about children and, thereby, help teachers to gain more insight into the children they teach. In addition, the study suggests techniques which may prove useful to physical educators in the observation of children.

CHAPTER II

REVIEW OF LITERATURE

Literature related to both non-verbal behavior and anxiety is extensive and found in widely scattered and diverse sources. Reports of controlled research in non-verbal behavior of anxiety however, are limited; therefore, the summary of the literature will include both selected general sources and specific sources pertinent to the problem of this investigation, i.e., the relationship of anxiety to movement behavior in children. The categories of the review are: (a) overview of anxiety, (b) anxiety in children, (c) general research on non-verbal behavior, (d) conceptual schemes and classifications of non-verbal behavior, and (e) the effect of non-verbal behavior upon children.

Overview of Anxiety

There is an immense amount of literature on theory and assessment of anxiety which reflects different constructs and concepts of anxiety and its derivation. Of particular interest to this investigation are the theories which have been concerned with defining or describing anxiety as a personality variable which has a basis in the characteristics of the individual established very early in development. The constructs of psychoanalytical theory and its variations, the "trait-state" conceptualization by Spielberger, and

the developmental explanations of Sullivan are included. These constructs and conceptualizations appear to describe anxiety as a basic behavioral characteristic.

Freud's theory is presented as a prototype of psychoanalytical explanations. Cofer (1964) stated that Freud viewed anxiety as a uniquely unpleasant experience to which the ego responded by acting in advance to avoid the unpleasant stimulation (p. 618). Reality-oriented anxiety, caused by real dangers, stimulates the ego to respond adaptively in order to protect itself. In addition, the ego may be provoked to respond in other ways. Excessive pressure on the ego from both the id and super ego engenders conflict that breeds anxiety. The ego suffers from neurotic anxiety when it is pressured by the id. Moral anxiety besets the ego when it is overstimulated by the super ego. The release of energy from the two conceptualized sources to the ego usually forces the anxious ego to establish protective defensive measures such as repression, displacement, sublimation, and projection. The presence of anxiety and the accompanying defensive measures may become apparent in many of the overt behaviors of the individual. Withdrawal, general agitation, muscle tremors, and tics are a few examples of behavior associated with the presence of anxiety. Positive reality orientations such as information gathering, and problem-solving techniques may also be used by the ego.

Some writers suggest that the classification of anxiety into "trait" and "state" anxiety is equivalent, roughly, to the neurotic and moral, and to the reality-oriented anxiety of Freud's conceptualization. Among the theorists differentiating between trait and state

anxiety is Spielberger. According to Spielberger (1966), trait anxiety refers to an anxiety proneness which suggests that an individual has a behavioral disposition that predisposes him to perceive a number of objectively nondangerous circumstances as threatening. The response to the perceived danger is a state reaction disproportionate in intensity to the magnitude of the danger. State anxiety in response to dangers in the environment may be conceptualized as a transitory emotional condition that varies in its intensity and fluctuates over time. Consciously perceived feelings of tension and apprehension characterize the condition of state anxiety. A state reaction may initiate a behavioral sequence designed to avoid the situation or it may evoke defense maneuvers. According to Spielberger, when the defense mechanisms become strong, the reality-oriented anxiety level decreases. Individuals with high levels of trait anxiety are likely to find more situations which will provoke an anxiety state than those with low levels.

Sullivan's theory of anxiety and its defense mechanisms differs from Freud's and Spielberger's. Fischer (1970), who discussed Sullivan's views, stated that Sullivan believed a person evolved from the state of human animal to a culturally meaningful human being. The individual learns to seek security and satisfaction in an attempt to avoid anxiety which, according to Sullivan, is a tension phenomenon that emerges from one's interpersonal relationships with others. Even very young infants experience anxiety which may be caused by feelings of insecurity with an adult. In order to decrease his level of anxiety and to control his environment, the anxious individual develops and uses what Sullivan

refers to as "security operations." Examples of these defense mechanisms are substitution, dissociation, sublimation, and selective inattention. Although these mechanisms may help the individual to cope with the present, they do not erase completely the remaining vague apprehensive feelings that are characteristic of anxiety.

Sarason, through his work in developing assessment tools to measure anxiety levels in children, was responsible for numerous contributions to the literature on children's anxiety. Sarason, not a theorist himself, based his work on the theories of Freud and Spielberger (Sarason et al., 1960). The General Anxiety Scale for Children, developed by Sarason et al., (1960), reflected Freud's concept of anxiety as a personality characteristic that is found in children. The test was designed to measure levels of trait anxiety. The Test Anxiety Scale for Children, developed by Sarason et al. (1960), reflected Spielberger's concept of "trait-state" anxiety. Anxiety levels occurring during test and stress conditions were measured by the Test Anxiety Scale for Children. Both of Sarason's tests made it possible for researchers to seriously examine the anxiety levels of children.

Explanations of the derivations of anxiety are many. The causes and manifestations of anxiety are numerous and may be as varied as the individuals who experience the many different psychological and physiological responses to it. Whether anxiety is a basic characteristic, or a response learned from very early association with other people, it appears to be a psychological phenomenon with which most children, as well as adults, must contend in some way.

Anxiety in Children

The literature on children's anxiety is extensive in the area of descriptions of anxiety and the accompanying overt behaviors. Of immediate interest is the research which used tests and techniques that are based on the theories and conceptualizations of anxiety reviewed above.

Some early writings on anxiety provided descriptions of the types of overt behavior exhibited by anxious children. For example, Thompson (1962) described the anxious behavior of insecure children as: angry outbursts, tantrums, nervousness, inactivity, withdrawnness. Johnson and Medinnus (1965) characterized the behavior of children identified as anxious by the Taylor Manifest Anxiety Scale thus: "their conduct becomes rigid and stereotyped . . . or it may resemble flight reaction" (p. 585). More specifically, the individual appeared to be restless, hyperactive, nervous and uneasy. Saurey and Telford (1967) stated that anxiety was cumulative. It interfered in time with an individual's achievement and caused him to feel helpless, exhausted, or excited. Spielberger (1966) noted that Sarason believed it was possible to see direct evidence of manifest anxiety in preschool children, but after preschool years it was much more difficult to observe the overt manifestations of anxiety in children because they had learned to hide their anxiety through many of the means employed by adults. Spielberger (1972) suggested that the different anxiety reactions were due to the interplay of fear and two or more negative or positive emotions. When fear was combined with negative emotions

such as distress, shame, or anger, the anxious individual reacted by withdrawing or showing hostility. However, when the positive emotion of interest was combined with fear, the anxious person responded with excitement.

Researchers examined the performances and behaviors of children who were anxiety prone. Two studies by Castaneda, Palermo, and McCandless (1956) demonstrated the effect that a complex motor task had on high and low trait anxiety subjects. The Taylor Manifest Anxiety Scale was given to grade 4 children in order to select 36 subjects from the upper and lower 20 percent tested. The subjects were given 20 trials on a 2 push-button light panel. The results showed that the high-anxiety group made more errors than did the low-anxiety group. The test was repeated with 21 high- and 16 low-level anxiety children from grade 5. The light panel used contained 5 buttons and the number of trials given increased to 25. Again, the results showed that the high-anxiety group was inferior to the low-anxiety group when the task was complex. However, when the task was simplified the high-anxiety group had superior results compared to the low-anxiety group. Children in the high-anxiety group perceived the complex task as too threatening; thus, their state anxiety level increased to the point that it interfered with their motor performance. Spielberger (1972) explained that a person who has a high level of trait anxiety tends to perceive a larger number of situations as dangerous or threatening. The response to threatening situations increases the person's level of state anxiety with a consequent effect on behavior.

Hill and Sarason (1966) completed a longitudinal study with elementary grade children to examine the relationship between anxiety and performance. They found that children with high levels of anxiety exhibited relatively low performance under stress and test conditions. Another observation made in the longitudinal study was that highly anxious children tended to blame themselves for their failures, to be dependent on others, and to experience difficulty in expressing their hostility in a manner suitable to the situation.

Gaudrey and Spielberger (1971) reported a study by Lipsitt in which the relationship between self-concept and high levels of anxiety was examined. Lipsitt gave children in grades 4,5, and 6 the Children's Manifest Anxiety Scale (CMAS) and a self-concept test. A significant negative correlation was found between the CMAS scores and the self-concept scores for all grade levels. There was a strong tendency for high-anxiety prone children to be self-disparaging and to have negative expectations of themselves. They found it difficult, often, to perform in a sociably acceptable manner.

Doyal and Forsyth (1973) and Duffy and Martin (1973) examined the influence which teachers had upon the performances of highly anxious children. In the Doyal and Forsyth (1973) study, Sarason's Test Anxiety Scale for Children (TASC) was given to 234 grade-3 children from 10 classrooms. The teachers were given the Manifest Anxiety Scale (MAS). Five months later all subjects were given their respective tests again. The results indicated that teachers with high levels of anxiety may negatively influence the performance of children with high levels of anxiety.

Duffey and Martin (1973) studied the effect of direct and indirect teacher influence on recall performance of 62 grade-6 boys. The State-Trait Anxiety Inventory (STAI) was used to determine which boys had high or low levels of anxiety. Boys with both high and low levels of anxiety were assigned randomly to direct and indirect teacher influence groups. An achievement test was given to the subjects at the beginning and at the end of the experiment. Results showed that the low level trait anxiety children in the indirect teacher influence group maintained low state anxiety. The high level trait anxiety children showed an increase in state anxiety. The low level anxiety children in the direct teacher influence group showed a low increase in state anxiety, while the high level trait anxiety children's state anxiety increased above an optimal level.

Anxiety as a state, among American and Mexican children, was studied by Spielberger and Diaz-Guerrero (1976). Over a period of 6 years, the investigators observed 392 children under a condition of stress induced by examinations. The children were given the Holtzman Inkblot Test (HIT) and Sarason's Test Anxiety of Children (TASC) before they were paired by sex, socioeconomic level, and school grade. Results for both cultural groups showed that the TASC scores decreased as the children aged. Mexican children had higher scores on the TASC than did the American children. For both cultural groups, the TASC scores were highest for the low socioeconomic children. The investigators hypothesized that the Mexican children have higher state anxiety in examination situations than do American children; however, Mexican children have lower state anxiety in social interaction situations with adults than do American children.

The final conclusion made by the investigators was that Mexican children have lower trait anxiety and higher state anxiety than American children. The study suggests that the state anxiety of children is influenced more by situations experienced infrequently than by situations experienced regularly.

Children, as well as adults, have to contend with anxiety. For some children, anxiety produces excitement and positive benefits; for other children, anxiety causes the individual to perform at less than his maximum level socially, emotionally, physically, and intellectually.

General Review of Non-Verbal Behavior

Although numerous studies of non-verbal behavior have been recorded, the focus of the general review which follows is an examination of research related to displays of emotions, communication patterns, and methods used to study non-verbal behavior. Early studies on non-verbal behavior were general with respect to how the research was done and the type of conclusion drawn. Tomkins (1962, 1963), citing the face as the site of primary emotions, observed and described non-verbal behavior in terms of minature movements made by facial muscles. He theorized that as a person became aware of the feedback gained from the facial muscles, the individual became aware of the feeling or emotion being experienced. The descriptions of facial movements were given labels which identified emotions; for example, shame was characterized by lowered eyelids, slightly dropped head, and in some cases blushing. Surprise was characterized by raised eyebrows, wrinkled forehead, open mouth, blinked eyelids, and protruded lips. Tomkins'

work was helpful in establishing descriptions which identified emotions; however, such detailed descriptions are cumbersome when a researcher has to identify movements accurately, quickly, and continuously.

Dittman (1968) used photographic equipment to aid his study of facial and body movements. He constructed five movie clips which showed facial clues in conflict with body clues. An example was a clip that showed a person smiling while the body extremities moved in an agitated manner. He had two groups of judges, psychologists and dancers, rate both the body and facial expressions separately as pleasant or unpleasant. Dittman's results showed that all the judges found it easier to rate the facial expressions than to rate the movements made by other areas of the body. The dancers were more aware of the body movements than were the psychologists. Dittman's conclusion that interpretation of non-verbal signals relied heavily on facial movements supports the contention made by Tomkins.

Ekman (1967) had a panel of judges examine pictures taken of interviews to determine what emotion was expressed. Four types of non-verbal clues were noted: (a) body acts, (b) body position, (c) facial expressions, and (d) head orientation. Also considered was the nature of the emotion and the intensity of the emotion. Ekman found that specific emotions were perceived from facial expressions and body acts. The head orientation and body position showed gross effective states. The intensity of the emotions was most obvious, generally in facial expressions, but intensity of emotion was seen also in body position. When the facial expression was hidden, clues

as to the intensity of the emotion might be observed from the head position. Ekman stated that "body acts usually convey from moderate to high intensity, while body position can convey full range of intensity" (p. 723).

Ekman's work (1967) was more refined than Tomkins' (1962, 1963) early descriptions. He not only showed how movements found in the different areas of the body were related, but he indicated where the intensity of the emotion being expressed was most readily observed.

As time passed, researchers gained greater control over their observations by developing methods to examine more minute aspects of non-verbal communication. Watson (1972) represents a researcher who gained greater control over his research setting. He studied male foreign students in a laboratory type of situation to test his hypothesis that "people do what they do, no matter where they are, according to a set of rules . . ." (p. 449). He paired subjects according to friendships, and placed them in a room with a table and chairs. They were told to talk about anything they wished. They were observed from behind a one-way screen for five minutes by experimenters who recorded on paper, movements, gestures, eye contact, and what distance apart subjects kept during the given time. Watson found that Arabs, Latin Americans, and Southern Europeans touched each other more frequently, had more eye contact, and faced each other more directly than Asians, Indians, Pakistanis, and Northern Europeans.

Following the same laboratory procedures, except for adding videotaping, Watson (1972) repeated his experiment with black and white college female and male Americans. The subjects were paired by the

same racial and sexual subgroups. Although the data analysis is incomplete, the findings were (a) all females had more eye contact than males, (b) white males faced each other more directly than did black males, (c) black females appeared to interact with a higher voice level than did white females, (d) black females had more eye contact and interacted at a closer distance than did black males, (e) white females had a lower voice level than did white males, (f) black males sat closer and used less eye contact when with white females, whereas the white female employed a lower voice level, and (g) white males had more eye contact when with black females.

Watson's (1972) work suggests methods for controlling and improving observations. By having the experimenters count the frequency of gestures, eye contact and other movements to be observed, Watson was able to collect for each factor specific data which could be analysed. Video-taping gave Watson a means for re-examining and checking the reliability of the experimenters' recordings. Video-taping made difficult observations, such as viewing eye-contact, easier to assess.

Compared to Watson's (1972) laboratory research method, Ellsworth and Ludwig (1972) used a completely different research method. They reviewed the literature on visual behavior during social interaction. They found that eye contact occurred from 28 percent of the time to 70 percent of the time in a dyad situation. Under stressful situations, gaze direction varied from 8 to 73 percent. There was considerable individual variation in visual contact depending upon the situation and whether or not an individual was the speaker or the listener.

Like Watson (1972), Ellsworth and Ludwig (1972) found women engaged in more eye contact than men did when speaking and listening. Women seemed to be more dependent on visual communication than were men. Ellsworth and Ludwig (1972) reported that Argyle found socially poised people looked at others more frequently than did socially anxious people. The researchers reported that Hutt and Ounstead found that autistic children were "characterized by extreme gaze aversion, which they interpreted as reflecting fear of rejection" (Ellsworth & Ludwig, 1972, p. 382).

Looking at a person when speaking signalled the listener of one's intent to speak or to stop speaking. The speaker looked at the listener in order to gain feedback. If the listener's response was not favourable, the speaker changed his performance. When the speaker avoided eye contact, it was either because he did not wish to be interrupted, or he was uncertain of what he was saying. Eye contact avoidance was also observed in situations in which the speaker wished to hide his emotional arousal.

A listener engaging in eye contact reinforced a speaker's activity. Avoidance signalled disapproval and lack of interest in the speaker. Therefore, eye contact, or lack of it, served as a form of communication or feedback for both the speaker and the listener. Frequent and continuous eye contact usually indicated close relationships. The eye contact suggested approval, or interest, or liking. However, an extended directed gaze, such as a stare, was found to arouse an emotional state within the victim.

Ellsworth and Ludwig's (1972) review showed that research in non-verbal behavior has progressed to the stage where researchers are able to interpret their results. Their research suggests that considerable work has been done by investigators in the area of visual behavior during social interaction. Ellsworth and Ludwig shared a common concern with Tomkins (1962, 1963), Dittman (1968), Ekman (1967), 1969) and Watson (1972). All investigators, regardless of their own particular focus of non-verbal behaviors, said it was necessary to view the movement behaviors within the context of the situation in which they occurred. A movement pattern or gesture was understood more fully if the social situation and social interaction, which were taking place at the same time, were considered.

Conceptual Schemes and Classifications of Non-Verbal Behavior

As researchers became more exacting in how they studied non-verbal behavior, schemes and classifications were developed to clarify what was being observed. Scheflen (1964) developed the scheme of point, position, and presentation to analyse non-verbal interaction. The scheme had a hierarchical order of movements similar to the verbal language scheme of syllables, words, and sentences. A point in movement occurred when a person shifted his head position at the end of a structural unit. The maintenance of the head position marked the duration of the point. Most people have three to five head positions in their repertoire of movement. The gross postural shift which occurred after several points were made was called a position. A

presentation occurred at the conclusion of the total number of positions within a given interaction. The presentation was marked by a large change in posture such as standing up.

Three dimensions which occurred simultaneously during interaction were (a) inclusiveness—noninclusiveness of posture, (b) vis à vis—parallel body orientation, and (c) congruence—noncongruence of stance. Inconclusiveness versus noninclusiveness defined the space for the activities. It delimited the access to and within a group. Vis à vis versus parallel body orientation gave evidence about the type of social activities. Reciprocal interaction was the former, while parallel activity was initiated by one person and embellished upon by the second person. Congruence versus noncongruence examined the positioning of the body extremities. It indicated whether association or nonassociation was occurring among members. Congruence frequently gave the idea of mutual identification in a common behavior.

Scheflen (1964) developed his scheme by analysing a variety of films which showed social interaction situations. He examined the total happening by first breaking the action into units and then stages. Both the units and stages were related to the entire interaction before interpretations were made.

Ekman and Friesen (1969a)developed the categories of deceptor movements and adaptor movements to identify and describe types of motor behavior which did not match verbal behavior. Deceptor movements were divided into two types--namely, the alter-deception and the self-deception. They were thought to be employed to deceive the self as well as the observer. Adaptor movements were identified as movements

used to facilitate or block sensory input. They appeared in acts of holding or touching specific body parts. The body part touched symbolized what the individual was either doing to himself or wanted done to him. Scratching, picking, and holding body parts were examples of self-adaptors, while attacking movements or protective movements were examples of alter-directed adaptors.

Ekman and Friesen (1969a) developed a coding procedure to show the relationship between the act itself and what it signified. This coding included arbitrary movements, iconic movements, emblems and illustrator movements. A movement, such as the opening of the hand during a greeting gesture, has no known meaning. It was called an arbitrary movement because it bore no resemblance to what it signified. An iconic movement, however, indicated the action it represented, for example, the cutting action of the finger as it is drawn sideways under the chin is clearly understood. Emblems were actions consciously used by a particular culture. There was a direct relationship between the act and the verbal translation of it. Referees use emblems when officiating games; for example, the hands rotated around each other mean travelling has occurred in a basketball game. Illustrators were movements directly related to speech. Politicians, ministers, and public speakers use illustrators to emphasize important words and phrases in a text.

Ekman and Friesen (1969b), like Scheflen (1964) used film analysis to develop their categories and to show the interaction between the various parts of the scheme. The importance of not isolating movements from the total framework of the interaction was stressed. A major difference between the two systems was that while Scheflen

(1964) showed the order, stages, and sequence of a total movement pattern, Ekman and Friesen (1969) analysed and interpreted the various categories developed.

Birdwhistell (1970) framed a comprehensive coding scheme of kine, kineme, kinemorph, and social kinesics to analyse the communication patterns of movements. The kine represented a minimal movement made in an area of the body. The kineme represented a set of interchangeable movements. A range of movements which were meaningful in the context of larger patterns were called kinemorph. Social kinesics occurred where the act, a meaningful pattern in one body area, or an action which formed a pattern involving more than one area, related to larger communicating frames.

Birdwhistell (1970) studied the movements categorized through detailed film analysis. Films were reviewed many times at a very slow speed so that each movement could be separated and distinguished. Once each part was recognized and analysed, it was considered in respect to other movements and the total movement patterns. Birdwhistell's scheme was an involved and complicated form of analysis which paralleled a linguistic approach. As such, it would take considerable time to acquire the skills needed to implement the system.

Compared to Birdwhistell's (1970) examination of every minute movement, North's (1972) work appeared to study gross motor patterns. However, North's examination of gross motor patterns was very detailed and involved in determining where and how a movement was initiated, the force used to initiate and perform the movement, and the time and body space used in executing the movement. North's system for analysing

movement patterns was based upon Laban's (1960) analysis of the efforts. North studied the gross motor acts of children to learn if a movement assessment, based on the effort combinations, was a reliable instrument for assessing personality. Observers, skilled in Laban's work, made individual movement assessments on children of different age levels in dance and movement situations. The findings were analysed and then correlated with teachers' observation reports, Stanford-Binet Intelligence Scale, and the Children's Apperception Test (CAT). Each of the above reports were made independently of each other. North stated that the qualitative aspect of movement revealed a relationship between cognitive and emotional characteristics and body movement. The effort factors reflected the individual's attention; for example, the space factor revealed the flexibility or directness of attitudes. The weight factor showed the sensitivity or forcefulness of inattention. The use of time factor indicated the leisureliness or urgency of a decision, while the flow factor revealed the ease or restraint of the action (North, 1972, p. 231). North saw her system "as a tool to be used in cooperation and coordination with other diagnostic and therapeutic techniques" (p. 120).

North's work has been criticized because no statistical evidence was provided to support her statement that the observation assessments agreed or disagreed with the other tests applied. There was no evidence offered either for the validity or reliability of the observers. North's work is important, however, because it used gross movement rather than facial or hand gestures to study the relationship between personality and movement behavior.

Smith and Hawkes (1972) developed a topology of fiddles to explain how movements aid communication by reducing personal anxiety and strengthening interpersonal bonds. The fidget fiddles lowered or released anxiety; for example, doodling with a pen reduces tension. Ritual fiddles, such as combing the hair, were considered to be minor tasks which required little thought when being performed. Task fiddles were group activities, for example a charity organization, which promoted group solidarity. Smith and Hawkes did not indicate how they collected data to develop their topology. Compared to other systems developed (Scheflen, 1964; Ekman and Friesen, 1969; Birdwhistell, 1970) Smith and Hawkes' system lacked data and analysis for verification.

The schemes and classifications reviewed in this study suggest the difficulty and complexity in devising systems which are practical and useable when observing non-verbal behavior.

The Effect of Non-Verbal Behavior Upon Children

Numerous studies reported the consequences which someone else's non-verbal behavior had upon children. Blumer (1936) stated that children learned expressive gestures, facial set, posture, and movement patterns from observing others. The children's attitudes were influenced by the affect displays they saw.

Galloway (1966) studied the non-verbal language of teachers and students as they verbally interacted together. He observed the gestures, facial expressions, body movements, silences, and voice intonations that occurred. He stated that pupils read the meaning behind

non-verbal expression, and those who observed non-verbal behavior believed it over the conflicting verbal response (p. 59). Galloway stated that the culturally disadvantaged child, and the child who had arrived from a different country were very dependent upon non-verbal language. Their lack of understanding of the verbal messages by teachers made them rely upon the non-verbal messages. The problem was intensified when the teachers' non-verbal messages were inconsistent with their verbal messages.

Mehrabin and Ferris (1967) investigated the decoding of consistent and inconsistent messages of teachers with children. They rated each facial and each verbal expression made by teachers as positive, neutral, or negative. Consistent communication was identified when the rating for the facial expression corresponded with the verbal expression. Inconsistent communication occurred when, for example, the teacher told a child to come and tell her story, while at the same time she turned away to pay attention to another child. Mehrabin and Ferris found the child was uncertain as to his own response when the teacher's facial clue did not match her verbal instruction. In such situations the facial clue was stronger than the verbal clue. Mehrabin and Ferris' work supported Galloway's (1966) statements that children believed non-verbal messages over the conflicting verbal response.

A study completed by Chaikin et al. (1974) may explain why Galloway (1966), and Mehrabin and Ferris (1967) found teachers' non-verbal messages to be inconsistent with their verbal messages. Chaikin et al. (1974) studied the effect that teachers' expectations had upon their own non-verbal behavior when working with children. Two confederates,

aged 10, were trained to behave consistently in a given situation. A group of 21 males and 21 female undergraduate students were told they would each teach a child a safety lesson for 10 minutes. They were told the sessions would be video-taped in order to study the room's lights. Just before the students met the confederate they were told either that the child was highly motivated, intelligent, and that he got along well with his peers, or that the child was highly motivated, of low intelligence and that he got along well with his peers. Raters examined the video-tapes to record the frequency of head nods, eye gaze, smiles, frowns, and forward or backward lean of the teacher. Chaikin et al. (1974) found that teachers who thought they were teaching a bright child leaned forward more, had more eye contact, nodded more frequently, and smiled more than did teachers who expected the child to have limited abilities. Questionnaires given to the teachers revealed they were not aware that they behaved differently toward children with different abilities. The results suggest that teachers need to become more aware of the impact their non-verbal behavior may have upon children.

Children are influenced not only by the teachers' non-verbal behavior patterns but by the natural surroundings in which they find themselves. Loo (1972) studied the behavioral effects of high and low spatial density on 60 children ages 4 and 5. The children were observed during two 48-minute sessions of free play. The room used had portable walls which changed the amount of space available for each of the sessions. A rating scale for each set of observations was used by six judges who rated the social behaviors which were listed as aggression, dominance,

nurturance, resistance, submission, social interaction, and number of interruptions. Specific descriptions of each trait listed were not provided in the report. Significantly less aggression and less social interaction occurred during high density conditions. As space increased, aggression increased for the boys. Loo found that children isolated themselves and interacted less in high density situations than in low density situations. He stated, "segregation may serve to reduce conflict and to protect oneself from spatial intrusions . . . It may be the child's way of increasing psychological distance from others when physical distance is limited" (p. 319). Although stress due to overcrowding may cause aggression, Loo believed people adapted to stress and decreased aggression. It would be difficult, however, to say what would happen if prolonged stress occurred. What Loo did show was that under controlled conditions, motor behavior was influenced by aspects of the environment such as the amount of space available.

Summary

Literature related to both anxiety and non-verbal behavior has been reviewed in order to focus upon the various aspects which are pertinent to this study. The reports and summaries of anxiety theories as developed by Cofer (1964), Spielberger (1966), and Fischer (1972) were reviewed to provide a framework for this study. The selected theories conceptualized anxiety as a personality variable which supported the construct of anxiety as a personality trait. The work of researchers such as Castenada et al. (1956), Hill and Sarason, (1966), and Spielberger and Diaz-Guerrero (1976) demonstrated that reliable instruments

to measure state and trait anxiety have been developed. The early writings by Thompson (1962), Johnson and Medinnus (1965), and the later writings by Gaudrey and Spielberger (1971), Doyal and Forsyth (1973), and Duffey and Martin (1973) have demonstrated the effect that anxiety may have upon facial movements, motor performance, and academic achievement.

In addition the literature reviewed has suggested that individuals display their emotional states through their non-verbal behavior (Tomkins, 1962, 1963; Johnson & Medinnus, 1965; Hill & Sarason, 1966; Ekman, 1965; North, 1972; Spielberger, 1972). Children believe a non-verbal message before they believe a verbal response (Galloway, 1966; Mehrabin & Ferris, 1967). It would seem imperative, therefore, that educators be aware that their non-verbal behavior may convey to the child messages of low expectations, displeasure, or anxiety. Such messages have a negative effect upon, especially, the high anxiety prone child's performance and his attitudes towards himself (Hill & Sarason, 1966; Gaudrey & Speilberger, 1971; Doyal & Forsyth, 1973; Duffy & Martin, 1973). It would also be beneficial if educators became more aware of the anxiety-prone child's non-verbal messages.

The studies reviewed show that there is a lack of information on how to examine children's overt behaviors. The non-verbal schemes and classifications reviewed did not provide many viable methods for studying the dynamic motor patterns of children (Scheflen, 1964; Ekman & Friesen, 1969; Birdwhistell, 1970; Smith & Hawkes, 1972). North's (1972) study suggested a possible system to use. It indicated that the effort combinations displayed in gross motor patterns may be a

means for identifying the movement characteristics of anxiety-prone children. Therefore, if children with high anxiety are identified, it may be possible, by using the effort analysis system, to determine if there is a relationship between anxiety and movement patterns.

CHAPTER III

PROCEDURES

The purpose of the study was to determine if there was a relationship between anxiety in children and their non-verbal behavior. More specifically, answers to questions about the relationship existing between the anxiety of children and their movement behavior as defined by the effort combinations of weight and flow, and time and flow were sought.

Preliminary Study

Before the main problem could be studied, a preliminary investigation was completed to determine whether or not a discriminating range of scores could be obtained on the General Anxiety Scale for Children. The scale was administered to 44 male and female children, 8 to 10 years old, in 2 ungraded classrooms of the predominantly black Hampton Institute, Hampton, Virginia. The test scores ranged from 7 to 36 points. Test scores of 25 and above fell in the upper quartile range of scores for the group tested. Children with test scores of 25 or above were considered as potential subjects for the study. After their test results on the Index of Graphic Constrictiveness-Expansiveness and the sociometric test were analysed with the criteria for selection applied, 10 children were selected for the study. Specific data on the results of the General Anxiety Scale for Children are arrayed in the analysis chapter.

Main Study

Sources of Data

Subjects. The principal of the ungraded school at Hampton Institute, Hampton, Virginia gave permission for the 44 pupils in the age range of 8 to 10 years to be tested. The children were considered for selection if their test results on the General Anxiety Scale for Children were in the upper quartile range of scores of all children tested. In addition to the high score on the General Anxiety Scale for Children, the children's scores on both the Index of Graphic Constrictiveness-Expansiveness and the sociometric test had to be such that they qualified the children to be categorized as (a) children who denied their anxiety, and (b) children with either social ties or children in social isolation. A median score for both tests administered was calculated and used to determine the placement of the children. In the case of the sociometric test, a median for each class was calculated because the children had named their friends from within their own class group. The Index of Graphic Constrictiveness-Expansiveness is used in conjunction with the sociometric test. A child who scored below the median of the sociometric test for his class had to score above the median for the Index of Graphic Constrictiveness-Expansiveness to qualify as a subject in the classification of denied anxiety with social isolation (DASI). Children were selected for the denied anxiety group with social ties (DAST) when their scores on the sociometric test were above the class median, and their scores on the Index of Graphic Constrictiveness-Expansiveness test were below the group median. After the selection criteria for the 3 tests had been applied, it was possible to select 10 subjects from the original group of 44 children for the study.

Instruments. The General Anxiety Scale for Children (Sarason et al., 1960) is one of the few tests developed to assess the anxiety level of children who are in the grade range of one to six. The instrument has been reported by Sarason et al. (1960) to have acceptable construct validity which was established by its usefulness in predicting behavior correctly in a number of different situations. Further validation was achieved by Sarason et al. (1960) through correlation with other tests, such as the Test Anxiety Scale for Children, and the Rorschach Inkblot Test. Although no specific reliability coefficients are ever quoted in the test construction literature, Sarason has given the test repeatedly to a number of children involved in his longitudinal studies on anxiety. The assumption is that satisfactory levels of reliability must have been achieved for the test. The test, containing 45 questions, is scored by totalling the number of positive responses made. Children whose scores are included in the upper quartile range of scores for the particular group tested are considered by Sarason et al. (1960) to be highly anxious,while children whose scores are included in the lowest quartile range of scores are classified as children with low anxiety. (See Appendix A for test questions).

The Index of Graphic Constrictiveness-Expansiveness is a non-verbal motor test designed to show constrictiveness or expansiveness in drawings. When the test was given to high anxiety prone subjects the test revealed denial of anxiety when the anxiety was related to the social status of the subject (Wallach, Green, Lipsitt, & Minehart, 1962). High anxiety prone subjects with many social ties indicated their denial of anxiety by making constricted drawings. Social isolates who denied their anxiety

made expansive drawings. The test required the subject to make three drawings within specified time limits. Wallach et al. (1962) reported that the correlation coefficients between drawings 1 and 2, drawings 2 and 3, and drawings 1 and 3 were .70, .69, and .81 respectively. All correlations were significant beyond the .001 level. Although the correlation coefficients were high, Wallach et al. did not suggest that the test be confined to one drawing. The objectivity reliability reported for scoring the test was .98. The test was scored by placing a grid of 20 equal-sized squares over each drawing made. The total number of squares containing lines for the three drawings was added and averaged. (See Appendix A for test samples).

A sociometric test was given to identify which subjects were considered to be social isolates, and which subjects had social ties within a class group. The sociometric median for a class group was used to determine which subjects were called social isolates and which subjects were classified as having social ties. Children with sociometric choices numbering above the class median were classified as subjects with social ties. Children with sociometric choices numbering below the class median were classified as social isolates. Wallach et al. (1962) noted that the median division was a relative distinction but one that is frequently used. He stated that "by using a median for each class it served to equate the classes for any possible difference in absolute frequencies that might result from differences in class size" (Wallach et al., p. 7).

The Sony-matic solid state video machine (number 3650) was the instrument used to record the gross motor patterns of the 10 selected subjects

in two spontaneous play situations. The instrument used 1/2 inch V-32 Sony tape and operated at a 7 1/2 speed.

Three judges to observe the video-tapes made of the 10 selected subjects, were selected on the basis of the following criteria: (a) comprehensive knowledge of Laban's analysis of movement, (b) skill and practice in observing effort actions, and (c) availability for observing the video-tapes at designated times. The three people selected had studied movement analysis for a year or longer at Laban's Art of Movement Studio, England. They were working currently within the area of movement education at their respective institutions, and were considered, in Canadian professional circles, to be experts in their field of study. It was necessary to have three judges in the event that disagreement occurred on what was being observed.

Collection of Data

Test administration for selecting subjects. The 44 children, 8 to 10 years of age, from 2 ungraded classrooms at Hampton Institute, Hampton, Virginia were tested on the following instruments: (a) General Anxiety Scale for Children, (b) Index of Graphic Constrictiveness-Expansiveness, and (c) a sociometric test. The tests were administered by the investigator in the regular classroom setting in one sitting. The order followed in the presentation of the tests was (a) drawing 1 for the Index of Graphic Constrictiveness-Expansiveness, (b) the General Anxiety Scale for Children, (c) drawing 2 for the Index of Graphic Constrictiveness-Expansiveness, (d) the sociometric test, and (e) drawing 3 for the Index of Graphic Constrictiveness-Expansiveness. Upon completion of the tests, the investigator and classroom teachers collected the test materials from each desk.

The General Anxiety Scale for Children was administered according to the instructions detailed by Sarason et al. (1960). (See Appendix A). Each question was read aloud slowly by the investigator. Immediately following the reading the children were given time to circle their response on a prepared answer sheet. When the children had completed a response to a question, they placed their pencils on the desk to indicate that they did not need any more time. When the test was finished, the children placed their answer sheets at one side of the desk, face down.

For the Index of Graphic Constrictiveness-Expansiveness test the children were presented with 3 sheets of drawing paper 18" by 12". They were instructed to place the longest side of the paper nearest to themselves. According to the instructions of the test the investigator provided a crayon for each child. The children were told they could draw whatever design they wanted to draw, but they were not "to draw things like people or houses or animals or anything like that—just designs"; (Wallach et. al., 1962, p. 8). The investigator timed each drawing period with a stop watch. The children were told when to begin drawing and when to stop. The time allocated for drawings 1, 2, and 3 was 180, 120, and 135 seconds respectively. When a drawing was completed the children were instructed to print their names at the top of the sheet, and to indicate by number which drawing it was before they placed the drawing face down at the side of the desk. (See Appendix A for instructions).

The sociometric test was given by asking the children to help arrange play groups. The children were instructed by the investigator

to write down the names of anyone in their class whom they wanted to have in their play groups. They were allowed to choose anyone present, absent, or as many or as few names as they wished. Each child printed his name at the top of the page upon completing his list. The list was then placed at the side of the desk face down. (See Appendix A for instructions). When the data from the sociometric test, the Index of Graphic Constrictiveness-Expansiveness test, and the General Anxiety Scale for Children were collected and analyzed for all 44 children, 10 children who met the criteria of the 3 tests were identified as subjects for the study.

Video-taping movements of subjects. The Sony-matic solid state video-machine (number 3650) was used to video-tape the 10 subjects in two spontaneous play situations. Two locations, an outdoor playground and, during morning hours and inclement weather, the school gymnasium provided the settings for the unstructured play situations. (See Appendix B). The school playground was the location used most frequently by the children during the noon-hour play period. At the upper end of the grassed playground was a man-made hill worn smooth by the many children who had climbed it. A metal jungle gym occupied the space at the lower end of the schoolyard. A few small trees were located to the left of the main play area mid-way between the hill and the jungle gym. The children played mainly to the right of the small trees in the area between the hill and the jungle gym. In this area they often played tag and a type of soccer-kick baseball. The children organized their own activities either as a group, alone, or in small groups. Teachers were not present always during the play period, but when they were, they did

not direct the activities. The children came to the playground after they had eaten their lunch in the main building. The two classes from which the subjects for the study were selected, came to the playground at about 11:30 a.m. and remained until 12:30 p.m., or, on some days, until 1:00 p.m. The video-tape deck was set at the edge of the driveway bordering the playground, midway down the length of the play area. From this location it was possible to film the center area, jungle gym, and the hill.

If the children did not complete their classroom work in the morning, they were not allowed to come to the playground. Several subjects from one class frequently missed the noon hour play period. This circumstance made it necessary to video-tape their play when they used the early morning playtime in the school gymnasium. The school opened the gymnasium at 8:00 a.m. to children who needed to leave home early. Children using the service, arrived in the gymnasium about 8:00 a.m., and remained there until shortly after 8:30 a.m. at which time they were allowed to go to their classrooms. This play period was unsupervised, although at various intervals, an adult or senior student might appear. There was no way of knowing ahead of time if the selected subjects would appear at the early morning play period.

The gymnasium, located on the second floor of the school, was used as an auditorium during the day. As a result of the gymnasium's multiple use, a number of chairs were located around the walls or stacked at one end of the room. Five large mats, a home-made balance beam, and a soccer ball were available for the children's use. The children played tag, soccer-kick baseball, and performed tumbling type activities.

Their play often changed from one activity to another depending upon how many children were present. The video-tape deck was placed as far back along the long wall as stacked chairs allowed. (See Appendix B).

The investigator video-taped each child for 20 minutes on two different occasions, separated by at least six days. No special order for filming the children was established due to the fact that the investigator had to wait each day to find out which children were allowed to participate in the play period. Fortunately, it was possible on several occasions to film two subjects at one time. This was not preplanned, and was possible only when two subjects played in close proximity to each other, thus allowing the person video-taping to focus upon both children at one time.

Training judges. The judges met together with the investigator at the Toronto College of Education, Toronto, Canada for both the training and observation sessions. Each session began at 3:00 p.m. and continued to 11:00 p.m. The judges' training program was extended over a three-day period during which they viewed a variety of tapes of children playing. Some training tapes had been made by the investigator while others were on loan from another investigator who had filmed young children in play situations.

The judges began the training program by first viewing a limited play situation of a child playing on a mat for three minutes. Verbal discussion of the effort combinations followed the viewing. If the judges did not agree with each other on what they viewed, the particular tape was repeated and discussed until the judges reached an agreement.

The next stage was to have the judges check on a prepared chart the effort combinations they viewed of a longer, five-minute tape. (See Appendix C for chart). The judges then compared their results to check for similarity in observations of effort combinations and the frequency count of the combinations. Again, if there was disagreement among the judges, the tape was re-run and discussed.

When the judges appeared to have the same frequency count for the major effort combinations viewed, they were asked to rate the intensity of each individual effort in the effort combination on a scale of 1 to 3. If the effort was identified, a rating of 1 was given. If the effort appeared excessive, a rating of 3 was assigned. Average or normal use of an effort received a rating of 2. (See Appendix C). It was evident at this time that the prepared chart was too cumbersome for efficient recording of the intensity and frequency count of the effort combinations. It was decided by the investigator and all three judges to record their results of the effort combinations in a list.(See Appendix C). Each effort was given an abbreviated symbol which was used by all judges, and the intensity score for the effort was written above the symbol. The new procedure allowed the judges to record their observations quickly. They spent less time looking away from the videotapes. Once the judges found it easier to record their observations, they suggested that several ground rules be established. Occasionally, they found it possible to record not just two efforts but three for an effort combination. It was agreed if they saw three individual efforts that they would record all three: for example, sudden, direct, and light. The intensity ratings would still appear above each individual

effort. For later recording purposes the investigator divided the set of three efforts into three combinations: for example, sudden and direct, direct and light, and sudden and light. Another adjustment made by the judges involved the appearance in the movement patterns of quickly repeated actions, for example: clapping the hands together. The frequency and intensity of each effort used in a series of quick claps posed a difficult recording problem. The judges agreed to record the efforts involved in the clapping movements, and to record above the effort symbol the intensity rating for each effort. They then indicated the number of times they had seen the movement, for example, sudden and direct repeated 12 times. When the judges came together to view the tapes of the 10 selected subjects for the second time a month later, they repeated the training program with the training tapes. This was done to allow the judges an opportunity to review the rating scale, the symbols which were used, and to re-establish the ground rules.

The Kendall rank correlation coefficient was used to determine the objectivity of the judges during the first training period. Correlations for judge 1 and judge 2, judge 1 and judge 3, and judge 2 and judge 3 were calculated to determine the agreement of the judges on the 48 effort components displayed by a child. Calculations were made for day 1, day 2, and day 3. (See Appendix D for results). By day 3 the average correlation coefficient was .85. The correlation coefficient of .85 indicated satisfactory agreement among the judges, and the judges were directed to view the video-tapes of the 10 selected subjects.

No information about the subjects or about the anxiety tests results were given to the judges. They were asked to observe and record all effort combinations viewed in the movement patterns. They viewed the video-tapes of the 10 selected subjects once, and then a month later viewed the same tapes for a second time. Each time the judges did continuous observations over a 20-minute period for each subject; therefore, it was necessary, in order to prevent fatigue, to stop the video-tapes during the observation periods. The judges watched five minutes of a video-tape and then were given a short break before they continued their viewing.

Treatment of Data

Intra-judge reliability. The intra-judge reliability was examined to determine if a judge would agree with herself when, on two separate occasions, she viewed the effort combinations displayed by a child. The Kendall rank correlation coefficient was used to determine if a relationship existed between the first and second viewing made by a judge of the effort combinations for each of the 10 selected subjects on video-tape 1, and video-tape 2. Each judge's intensity rating of the effort combinations, and frequency scores of the effort combinations for the two viewings of a video-tape were examined.

Inter-judge reliability. The inter-judge reliability was analysed to see if any relationship existed between the first and second viewing of video-tape 1, and the first and second viewing of video-tape 2 for (a) judge 1 and judge 2, (b) judge 1 and judge 3, and (c) judge 2 and judge 3. The Kendall rank correlation coefficient was used to determine if any relationship existed between judges on their intensity ratings of the effort combinations and on the judges' frequency scores of the effort combinations for each child.

The relationship between the movement patterns of tape 1 and tape 2. Before the relationship between anxiety and the effort combinations could be examined, it was necessary to determine whether or not a relationship existed between the effort combinations of the first and second video-tapings. If a relationship did not exist between the two video-tapings, an analysis for each video-taping would be required later when examining the relationship between anxiety and the effort combinations. The Kendall rank correlation coefficient was used to determine the relationship existing between the two video-tapings of the 10 subjects' effort combinations. In order to consider the raw scores assigned by the three judges as composite numbers, they were added and averaged for each (a) individual effort, (b) effort combination, and (c) frequency score. Because high agreement had been established for both intra and inter-judge reliability, it was possible to consider the three judges' scores as though they were one decision. This procedure eliminated the slight discrepancies among the judges which may have occurred when a judge blinked or looked away from the video-tape to record observations. The averaged scores of the judges for the first and second viewing of video-tape 1, and then video-tape 2 were examined for relationships on each of the following components (a) the intensity rating scores of the individual efforts, (b) the intensity rating scores for the effort combinations, and (c) the frequency scores for each effort combination. A relationship between the movement patterns of the first and second video-tapes was not established.

The relationship between anxiety and effort combinations. As noted above, the relationships between the first and second video-tapes were not significant; therefore, the judges' scoring of the first and second viewing of video-tape 1, and video-tape 2 was examined separately when the relationship between anxiety and the effort combinations was examined. The Kendall rank correlation coefficient was used to determine if any relationship existed between the anxiety scores of the 10 children and the judges' combined and average scoring of (a) the intensity rating scores of the individual efforts, (b) the intensity rating scores for the effort combinations, and (c) the frequency scores for each effort combination.

The relationship between DAST and effort combinations. The Kendall rank correlation coefficient was used to determine if any relationship existed between the anxiety scores of children categorized as DAST and the judges' combined and averaged scores of their effort combinations displayed through (a) the intensity rating scores of the individual efforts, (b) the intensity rating scores of the effort combinations, and (c) the frequency scores for each effort combination. The analysis was completed for both viewings of video-tape 1, and video-tape 2.

The relationship between DASI and effort combinations. The Kendall rank correlation coefficient was used to determine if any relationship existed between the anxiety scores of children categorized as DASI and the judges' combined and averaged scores of their effort combinations displayed through (a) the intensity rating scores of the individual efforts, (b) the intensity rating scores of the effort

combinations, and (c) the frequency scores for each effort combination. The analysis was completed for both viewings of video-tape 1, and video-tape 2.

Due to the nature of the study, levels of significance were not stated until the data pertaining to each section were analysed. Preliminary questions concerning the reliability of the judges, consistency between the movement patterns of the two sets of video-tapes, and the relationship between general anxiety scores and the movement pattern scores had to be answered before the main problems of the study could be analysed. The analysis of the data for the main problem indicated at what levels of confidence the various aspects were significant.

CHAPTER IV

ANALYSIS OF DATA

The purpose of this study was to determine if there is a relationship between children's anxiety and their movement patterns. Before the data related to the specific questions detailed in the statement of the problem could be analysed, data on (a) subject selection, (b) intra-and inter-judge reliability, (c) consistency between the movement patterns of video-tape 1 and video-tape 2, and (d) the general relationship between anxiety and movement patterns were studied.

Subject Selection

In order to select 10 subjects to be observed, all of the 44 children ranging in age from 8 to 10 years, who were enrolled in the ungraded school of Hampton Institute, Hampton, Virginia, were given the General Anxiety Scale for Children, the Index of Graphic Constrictiveness-Expansiveness, and a sociometric test. Obtaining particular scores on the General Anxiety Scale for Children was necessary in order to select the 10 subjects for the main study.

The range of scores attained by the subjects on the General Anxiety Scale for Children was 7 to 36. (See Table 1). The median was 21.5. To determine which children had the highest levels of anxiety, the upper quartile score was calculated. This score was found to be 25. All subjects with anxiety test scores of 25 and above were,

Table 1

Test Scores for Total Number of Children

Class One				Class Two			
Subject	General Anxiety Scale for Children	Sociometric Test	Index Graphic Constrictiveness-Expansiveness	Subject	General Anxiety Scale for Children	Sociometric Test	Index Graphic Constrictiveness-Expansiveness
1**	32	4	66	21	14	6	72
2*	25	0	69	22	13	1	62
3	14	3	69	23**	27	9	63
4	17	5	65	24**	30	5	68
5	13	1	71	25	20	4	72
6**	27	2	72	26	20	6	72
7**	26	1	72	27**	26	8	69
8	8	7	63	28	14	2	71
9	7	0	63	29	14	6	46
10*	27	3	71	30	19	3	59
11	23	4	71	31	22	11	59
12	15	5	71	32**	31	4	72
13*	36	4	71	33*	25	2	65

*Subject with anxiety score 25 and above.

**Ten selected subjects.

Table 1 (cont.)

Test Scores for Total Number of Children

Class One				Class Two			
Subject	General Anxiety Scale for Children	Sociometric Test	Index Graphic Constrictiveness-Expansiveness	Subject	General Anxiety Scale for Children	Sociometric Test	Index Graphic Constrictiveness-Expansiveness
14*	30	3	72	34	20	8	66
15	18	4	72	35	17	1	58
16*	30	3	72	36	23	3	68
17	19	3	26	37	22	2	69
18*	32	3	72	38**	27	2	71
19	10	3	72	39**	25	6	54
20	14	6	70	40*	33	7	72
				41	18	5	68
				42**	27	4	72
				43	24	10	72
				44	20	2	52

*Subject with anxiety score 25 and above.

**Ten selected subjects.

therefore, identified as high anxiety children. (See Table 1). According to Sarason (1960), the division of children into high and low anxiety groups should be particular to the group being tested.

The sociometric test scores ranged from 0 to 11. (See Table 1). Since the children, in two different classrooms, had been instructed to choose playmates from their own class group, medians for each class were calculated on the sociometric test. The median score for class 1 was 3; for class 2 it was 4.7. The medians were used to make a relative distinction between children who had social status within a group, and those who lacked social status within a group. Children, therefore, whose scores were on or above the median for their class group were considered to be children with social ties, whereas children whose scores were below the median were classified as social isolates.

The Index of Graphic Constrictiveness-Expansiveness scores ranged from 46 to 72 points with the median being 70.1. Again, the median was used to make a relative distinction between the degree of constrictiveness or expansiveness among the children with high anxiety. The higher the score, the more expansive was the drawing.

The Index of Graphic Constrictiveness-Expansiveness median, the sociometric medians, and the upper quartile range of scores on the General Anxiety Scale for Children were used to determine which 10 children were to be selected for the study. The 3 test scores for the 10 children are presented in Table 2. The scores on the General Anxiety Scale for Children show that each child scored in the upper quartile range of 25 or above. According to the Index of Graphic Constrictiveness-Expansiveness and the sociometric test instructions for

Table 2

Test Scores for Ten Selected Subjects

Original Number of Subject	Selected Subject Number	General Anxiety Scale for Children	Socio-metric Test	Index of Graphic Constrictiveness-Expansiveness
1	1	32	4	66
6*	2	27	2	72
7*	3	26	1	72
23	4	27	9	63
24	5	30	5	68
27	6	26	8	69
32*	7	31	4	72
38*	8	27	2	71
39	9	25	6	54
42*	10	27	4	72

*Social Isolate (DASI)

Social Ties unmarked (DAST)

interpretation, a child who had a sociometric score below his class median would need a score above the class median on the Index of Graphic Constrictiveness-Expansiveness to be considered a social isolate who denied anxiety. For example, subject 6 (Table 1) had a score on the anxiety test which was in the upper quartile range of scores for the group tested. The sociometric score of 2 placed him in the category of social isolate because the score was below the class median of 3. The score of 72 on the Index of Graphic Constrictiveness-Expansiveness was above the median of 70.1 for the test, indicating that the child's drawings were expansive. According to the Index of Graphic Constrictiveness-Expansiveness theory, a child who is a social isolate makes expansive drawings when he denies anxieties about his social isolation.

Another example which demonstrates the connection between social status and denied anxiety was found with subject 13 in class 1. (See Table 1). Subject 13 with a high score of 36 on the anxiety test, would appear to be a potential subject for the study. The score of 4 on the sociometric test was above the class median of 3 which would qualify the subject to be placed in the category of social ties. The score of 71 on the Index of Graphic Constrictiveness-Expansiveness, however, was above the median score of 70.1 which meant that the subject's drawings were expansive. The drawings would have to have been constricted in order for subject 13 to qualify as a subject who denied his anxiety because of his social ties.

Judges' Observations

Intra-judge reliability

Intra-judge reliability was analysed to determine a judge's agreement with self on observations made on two different viewings of video-tapes of the subjects. The Kendall rank correlation coefficient was used to determine the reliability on (a) the effort combinations observed, and (b) the frequency scores recorded for the effort combinations of each child. A detailed account of the correlations achieved by each judge for the two video-taping sessions are given in Appendix E. The correlation coefficient data from Appendix E are summarized in Table 3 by indicating the range of correlations for each judge on the effort combinations and frequency scores of the effort combinations. In addition, the summary provides the mean correlations

Table 3

Intra-Judge Reliability Coefficients

For the Ten Subjects

First Video-Taping	Effort Combination Range	Mean	Frequency Score Range	Mean
Judge 1	.67 - .99	.81	.70 - .99	.83
Judge 2	.77 - .94	.83	.78 - .94	.86
Judge 3	.65 - .97	.82	.65 - .97	.83
Second Video-Taping	**Effort Combination Range**	**Mean**	**Frequency Score Range**	**Mean**
Judge 1	.72 - .97	.82	.73 - .95	.85
Judge 2	.73 - .91	.83	.73 - .96	.84
Judge 3	.66 - .91	.82	.71 - .93	.84

$p < .001$ applies to all effort combination range and frequency score range values.

for each judge on the effort combinations observed and the frequency scores recorded. For example, on the first video-taping of the effort combinations, judge 1 had a low reliability correlation of .67 for one child and a high reliability correlation of .99 for another child. The effort combination reliability correlation for judge 1 ranged, therefore, from .67 to .99 for the 10 children. The average reliability correlation of the effort combinations was .81 for judge 1. In the same way, the frequency score range column in Table 3 shows the low and high reliability correlations received by a judge for her observations of the number of times she recorded the effort combinations of the 10 children. The frequency score mean shows the averaged reliability correlations for a judge on all her recordings of the frequency scores of the effort combinations for the 10 children. The lowest mean reliability correlation for effort combinations and frequency scores were .81 and .83 respectively. All three judges established, at the .001 level of significance, that they had acceptable intra-judge reliability for the effort combinations and frequency scores of the effort combinations.

Inter-judge reliability for the first video-tapes

Inter-judge reliability, which measures the agreement between judges, was determined by the Kendall rank correlation coefficient for the two viewings made by the judges of the first video-tapes of the 10 subjects. Table 4 presents the inter-judge reliability correlation coefficients for (a) the effort combinations, and (b) the frequency scores for both viewings of the first video-tapes of the 10 children. On the first viewing, judges 1 and 3 had higher reliability correlation coefficients than did judges 2 and 3 on both the effort combinations and frequency scores. Judges 1 and 2 had higher reliability correlations

on the effort combinations and frequency scores than did judges 2 and 3. The reliability correlations for the second viewing of the effort combinations and frequency scores showed that judges 1 and 3 had higher correlations than did judges 1 and 2, and judges 2 and 3. The latter, judges 2 and 3, had the lowest reliability correlations among all the judges on the frequency scores recorded. On the second viewing, all the judges had low reliability correlations for subject 8. In spite of this, the high reliability correlations for both the first and second viewings of the first video-tapes indicated agreement among the judges on their observations of the effort combinations. All correlations were significant at the .001 level of confidence.

Inter-judge reliability for the second video-tapes

The Kendall rank correlation coefficient was used to determine agreement among the three judges on their observations of the effort combinations and frequency scores for the second set of video-tapes. The inter-judge reliability correlations on (a) the effort combinations, and (b) the frequency scores for both viewings of the second video-tapes of the 10 children are presented in Table 5. The first viewing of the second video-taping of the 10 subjects, judges 1 and 2 had higher reliability correlations on the effort combinations and frequency scores than did judges 1 and 3, and judges 2 and 3. Judges 2 and 3 had lower reliability correlations on the 10 subjects than did the other judges. Subject 9 received the lowest reliability correlations from the judges. The analysis of the second viewing showed that judges 2 and 3 agreed more than judges 1 and 2, and judges 1 and 3 on both the effort combinations and frequency scores. The reliability correlations for subject 9 were higher on the second viewing than on the first viewing. The

Table 4

Inter-Judge Reliability on First

Video-Tapes of Ten Subjects

	First Viewing							Second Viewing					
	J1 & J2		J1 & J3		J 2 & J3			J1 & J2		J1 & J3		J2 & J3	
S	Eff. Comb.	Freq. Score	Eff. Comb.	Freq. Score	Eff. Comb.	Freq. Score	S	Eff. Comb.	Freq. Score	Eff. Comb.	Freq. Score	Eff. Comb.	Freq. Score
1	.72	.83	.72	.78	.72	.77	1	.75	.78	.91	.92	.77	.62
2	.89	.90	.76	.78	.71	.70	2	.75	.76	.79	.84	.86	.67
3	.77	.80	.86	.86	.74	.83	3	.75	.82	.79	.86	.87	.86
4	.85	.86	.87	.88	.81	.82	4	.87	.89	.84	.84	.87	.65
5	.83	.87	.81	.88	.79	.82	5	.83	.85	.93	.97	.82	.81
6	.67	.67	.68	.71	.83	.83	6	.88	.86	.92	.91	.87	.65
7	.71	.73	.81	.82	.70	.71	7	.74	.77	.84	.84	.82	.71
8	.81	.82	.90	.92	.82	.81	8	.56	.66	.59	.66	.62	.53
9	.68	.71	.71	.69	.74	.72	9	.88	.87	.87	.88	.93	.72
10	.94	.95	.94	.96	.95	.97	10	.78	.81	.85	.86	.85	.50

S = Subject

Eff. Comb. = Effort Combination

Freq. Score = Frequency Score

$p < .001$ applies for all values

Table 5

Inter-Judge Reliability on Second

Video-Tapes of Ten Subjects

	First Viewing							Second Viewing						
	J1 & J2		J1 & J3		J2 & J3			J1 & J2		J1 & J3		J2 & J3		
S	Eff. Comb.	Freq. Score	Eff. Comb.	Freq. Score	Eff. Comb.	Freq. Score	S	Eff. Comb.	Freq. Score	Eff. Comb.	Freq. Score	Eff. Comb.	Freq. Score	
1	.85	.86	.87	.88	.76	.80	1	.89	.92	.81	.87	.77	.82	
2	.88	.91	.79	.82	.77	.83	2	.76	.83	.77	.82	.76	.79	
3	.77	.83	.80	.83	.80	.90	3	.89	.93	.89	.89	.91	.92	
4	.77	.80	.77	.77	.84	.86	4	.81	.85	.73	.77	.82	.87	
5	.84	.89	.80	.82	.81	.85	5	.84	.87	.92	.91	.89	.92	
6	.84	.86	.84	.86	.79	.75	6	.83	.83	.89	.89	.89	.92	
7	.88	.89	.84	.83	.85	.85	7	.87	.87	.87	.89	.89	.90	
8	.95	.94	.86	.87	.82	.83	8	.70	.75	.75	.76	.70	.74	
9	.74	.75	.72	.73	.75	.78	9	.91	.92	.91	.87	.87	.88	
10	.93	.93	.98	.99	.94	.93	10	.77	.78	.82	.82	.93	.93	

S = Subject

Eff. Comb. = Effort Combination

Freq. Score = Frequency Score

$p < .001$ applies to all values

reliability correlations for subjects 8 and 10 were lower on the second viewing than on the first viewing. The reliability correlations for both viewings of the second set of video-tapes indicated agreement among the judges on their observations of the 10 children. The correlations were significant at the .001 level of confidence. The inter-judge reliability established was quite acceptable.

The relationship between movement pattern of video-tape 1 and video-tape 2

The 10 selected subjects were video-taped on two different occasions in order to determine if any relationship existed between their movement patterns for (a) individual effort scores, (b) combined effort scores, and (c) frequency scores. These relationships were examined after the intra- and inter-judge reliability had been established. Significantly high agreement among the three judges' scores was found. Therefore, through the technique of adding and averaging the three judges' scores for each (a) effort, (b) combined effort, and (c) frequency score, the scores were treated as though they were one. The Kendall rank correlation coefficient was used to complete the analysis of the 10 subjects' movement patterns for the 2 sets of video-tapes. Examination of Table 6 shows the relationship between (a) the individual efforts, (b) the combined efforts, and (c) the frequency scores for the two video-tapings of the children. The time and flow column shows a correlation coefficient of .81 for the sustained-bound flow individual efforts, combined efforts, and frequency scores. These high correlation coefficients were significant at the .005 level of confidence which means that there were relationships between performances on the 2 video-tapes with respect to these factors. Correlation coefficients were not

Table 6

Relationship Between Video-tape 1 and

Video-tape 2 Movement Patterns

	Weight and Flow		Weight and Time		Time and Flow		Space and Time		Space and Flow		Weight and Space	
	st - bf		st - sud		bf - sud		d - sud		d - bf		st - d	
Individual Efforts	.26	.30	.42	.48	.21	.21	.36	.47	-.03	-.12	.32	.29
Combined Efforts	.26		.47		.21		.33		-.05		.33	
Frequency Score	.36		.38		.21		.43		-.02		.30	
	l - bf		l - sud		bf - ss		d - ss		d - ff		st - ind	
Individual Efforts	-	-	.41	.36	.81*	.81*	.14	.29	.12	.16	.07	.18
Combined Efforts	-		.42		.81*		.29		.18		.07	
Frequency Score	-		.43		.81*		.25		.14		.14	
	st - ff		st - ss		ff - sud		ind - sud		ind - bf		l - d	
Individual Efforts	.47	.54	.21	.00	.41	.45	.09	.16	-	-	.16	.07
Combined Efforts	.48		-.16		.41		.16		-		.11	
Frequency Score	.51		.00		.48		.14		-		.05	
	l - ff		l - ss		ff - ss		ind - ss		ind - ff		l - ind	
Individual Efforts	.56	.48	-.43	-.45	.48	.12	.48	.46	.51	.47	.09	.32
Combined Efforts	.58		-.47		.14		.49		.47		.20	
Frequency Score	.42		-.28		.05		.52		.38		.07	

st = strong
l = light
bf = bound flow
ff = free flow
sud = sudden
d = direct
ind = indirect
p $\leq$ .005*

shown for the light-bound flow efforts in column 1, and the indirect-bound flow efforts in column 5. The computer data analysis sheet recorded that correlation coefficients could not be computed for these efforts because of insufficient data. Examination of Table 6 shows that low correlation coefficients were found for the remaining efforts. This suggested that the movement patterns observed for the first set of video-tapes differed from the observed movement patterns of the second set of video-tapes. The negative correlation coefficients indicated, furthermore, a different emphasis in the use of the various efforts for the two sets of video-tapes.

The relationship between general anxiety and effort combinations

The relationship between the general anxiety scores and the judges' scores for the (a) individual efforts, (b) combined efforts, and (c) frequency scores of the subjects were analysed for each set of video-tapes. A separate analysis for each set of video-tapes was necessary because the previous analysis did not show a significant relationship between performance captured on the two sets of video-tapes. The Kendal rank correlation coefficient was used to determine the relationship between anxiety scores and effort scores. (See Appendix F for complete details.) Table 7 summarizes the significant relationships between the anxiety scores and the (a) individual efforts, (b) combined efforts, and (c) frequency scores for each set of video-tapes. The weight and flow, and weight and time categories showed the lowest correlations which were significant at the .10 and .05 levels of confidence. The time and flow, and space and flow categories had higher correlation coefficients which ranged from -.63 for the frequency score of the sudden-free flow effort combination

Table 7

Relationships Between General Anxiety Scores

and Movement Patterns Scores

	Weight and Flow			Weight and Time			Time and Flow		
First Viewing Video-Tapes	st - bf	Comb. Eff.	Freq. Score	l - sud	Comb. Eff.	Freq. Score	ss - bf	Comb. Eff.	Freq. Score
Tape 1	.38*		.41*	.38*	.35*	.35*	-.52**	-.52**	-.52** -.52**
Second Viewing Video-Tapes	l - ff	Comb. Eff.	Freq. Score				sud - ff	Comb. Eff.	Freq. Score
Tape 1	-.43**	-.38*	-.40*				-.48**	-.43**	-.48** -.63***
Tape 2	-.36*	-.43**	-.45** -.35**						

Comb. Eff. = Combined Effort
Freq. Score = Frequency Score
st = strong
l = light
bf = bound flow
ff = free flow
sud = sudden
ss = sustained
d = direct
ind = indirect

*p ≤ .10
**p ≤ .05
**p ≤ .01

Table 7 (cont.)

Relationships Between General Anxiety Scores

and Movement Patterns Scores

	Space and Time				Space and Flow			
First Viewing Video-Tapes	d	- ss	Comb. Freq. Eff. Score		d	- ff	Comb. Freq. Eff. Score	
Tape 1	.50**	.50**	.50**	.50**	-.60***	-.63***	-.62***	-.62***
Second Viewing Video-Tapes					ind	- ff	Comb. Freq. Eff. Score	
Tape 1								
Tape 2					-.65***	-.60***	-.60***	-.65***

Comb. Eff.	= Combined Effort	ff	= free flow	*p	≤	.10
Freq. Score	= Frequency Score	sud	= sudden	**p	≤	.05
st	= strong	ss	= sustained	***p	≤	.01
l	= light	d	= direct			
bf	= bound flow	ind	= indirect			

to the lower -.43 correlation coefficient for the free flow individual effort of the time and flow category. These negative correlation coefficients were significant at the stringent .01 level, and the lower .05 levels of confidence respectively. The highest correlations, significant at the .01 level of confidence, were found for the space and flow category. These correlations of -.60 or higher indicated that there was a tendency for children with higher levels of anxiety to display less effort and effort combinations for the space and flow category than for children with less anxiety. Table 7 also indicates that there were more significant correlation coefficients found for the first set of video-tapes than were found for the second set of video-tapes. Video-tape 1 afforded more information than did video-tape 2.

Having established that (a) there were acceptable levels of intra- and inter-judge reliability, (b) that the two sets of video-tapes were to be analysed separately, and (c) that there was a relationship between the anxiety scores and some of the movement patterns of the children, the specific problems as stated in Chapter 1 were analysed. The Kendall rank correlation coefficient was used to analyse each major problem.

The relationship between DAST and effort combinations

The first major problem was to determine the relationship between DAST and the four weight and flow combinations of (a)strong-bound flow (b) light-bound flow, (c)strong-free flow, and (d) light-free flow. The data involving the four weight and flow effort combinations are displayed

in Table 8. It is of interest to note that on the first set of video-tapes there was a positive correlation of .63 between the strong-bound flow effort combination and the DAST group. This correlation was

Table 8

Relationships Between DAST Children and Effort Combinations of Weight and Flow

Weight and Flow Effort Combinations	Video-tape 1	Video-tape 2
Strong-Bound Flow	.63*	-.11
Frequency Score	.82**	.00
Light-Bound Flow	—	—
Frequency Score	—	—
Strong-Free Flow	.53*	.32
Frequency Score	.53*	.32
Light-Free Flow	-.95***	-.95***
Frequency Score	-.95***	-.53*

*p ⊲ .10
**p ⊲ .05
***p ⊲ .01

significant at the limited .10 level of confidence, but the frequency score for the same effort combination yielded a .82 correlation coefficient with DAST which was significant at the .05 level of confidence. The number of times the DAST children used the strong - bound flow effort combination was more significant than the intensity of the effort used. The highest weight and flow effort combination relationship with DAST children on video-tape 1 was observed with the light-

free-flow effort. (See Table 8). The negative correlation coefficient, -.95, was significant at the .01 level of confidence. This high relationship suggests a distinct tendency for DAST children not to engage in light-free flow movements. Light-free flow effort combinations are characterized by an effort quality that is minimal in its use of muscular tension and it appears to have an on-going, never-ending quality in the movement. High anxiety children with social ties did not display the light-free flow effort qualities with either frequency or intensity.

It may be seen from Table 8 that the second video-tape yielded no significant correlations except for the light-free flow effort combination and DAST. This correlation coefficient of -.95 was significant at the .01 level of confidence. The fact that a negative correlation for the same effort combination, which reached a highly significant level of confidence on video-tape 1, was seen also on video-tape 2 lends support to the statement about the tendency for high-anxiety children with social ties not to display intensity in the light-free flow effort combination.

The second major question studied the relationship between DAST and the four time and flow combinations of (a) sudden-bound flow, (b) sustained-bound flow, (c) sudden-free flow, and (d) sustained-free flow. Table 9 contains information on the relationships for the four time and flow effort combinations for DAST children. From that table it may be seen that the frequency score of the sudden-free effort combination was significantly related to the DAST category of children for the first video-tapes. The intensity with which the sudden-free flow effort

combination was demonstrated was much less significant than the frequency score, but higher than any other effort combination within the time and flow combinations of video-tapes 1 and 2.

Table 9

Relationships Between DAST Children and Effort Combinations of Time and Flow

Time and Flow Effort Combinations	Video-tape 1	Video-tape 2
Sudden-Bound Flow	.00	—
Frequency Score	.00	—
Sustained-Bound Flow	-.50	-.50
Frequency Score	-.50	-.50
Sudden-Free Flow	-.53*	-.11
Frequency Score	-.74**	-.11
Sustained-Free Flow	-.11	.00
Frequency Score	-.11	.00

*p $\lhd$ .10
**p $\lhd$ .05
***p $\lhd$ .01

The final problem examined for the DAST children involved the relationship between DAST and the 16 individual efforts derived from the 4 effort combinations of weight and flow, and 4 effort combinations of time and flow. Data related to the 16 individual efforts and DAST relationships are displayed in Table 10. On the first set of video-tapes, the most significant relationship for an individual effort and

Table 10

Relationships Between DAST Children and Sixteen Individual Efforts from Weight and Flow and Time and Flow

Individual Effort Factors	Video-tape 1	Video-tape 2
Strong	.81**	-.11
Bound Flow	.63*	-.11
Light	-	-
Bound Flow	-	-
Strong	.74**	.32
Free Flow	.53*	.32
Light	-.89**	-.76**
Free Flow	-.95***	-.89**
Sudden	.00	-
Bound Flow	.00	-
Sustained	-.50	-.50
Bound Flow	-.50	-.50
Sudden	-.53*	-.11
Free Flow	-.53*	-.11
Sustained	-.11	.00
Free Flow	-.11	-.12

*p < .10
**p < .05
***p < .01

DAST was observed for the light-free flow efforts. A correlation coefficient of -.89 (significant at the .05 level of confidence) was found for the light effort while a -.95 correlation (significant at the higher .01 level) was noted for the free flow effort. These negative correlations suggest, that when the individual efforts within the light-free flow combination were analysed, neither the light nor the free-flow effort were used by the DAST children.

It may be seen, however, that the DAST children tended to use both efforts in the strong-bound flow combination. These correlation coefficients of .81 and .63 were significant at the .05 and .01 levels of confidence. Earlier it was noted that DAST children used strong-bound flow efforts. (See Table 8). The data from Table 10 suggest that the strong effort in the strong-bound flow combination is the dominant effort in the combination.

The only significant correlation coefficients on the second set of video-tapes were the individual efforts in the light-free flow effort combination. A negative -.76 correlation was found for the light effort, while a slightly higher -.86 correlation was reported for the free-flow effort. Both correlations were significant at the .05 level of confidence. These results for the individual light-free flow efforts supported the results found for the same efforts on the first set of video-tapes. The light-free flow efforts do not appear to be characteristic of the DAST children studied.

The relationship between DASI and the effort combinations

The first major problem was to determine the relationship between DASI and the four weight and flow combinations of (a)strong-bound flow,(b)

light-bound flow, (c) strong-free flow, and (d) light-free flow. The data involving the weight and flow combinations are displayed in Table 11. It may be seen on the first set of video-tapes that only the strong-free flow effort combination and frequency scores were significnatly related. These negative correlations of -.60 were significant at the restricted .10 level of confidence. Although the correlations were low, a tendency by the DASI group not to use strong-free flow effort combinations in their movement patterns is suggested. This contention was supported by the observations from the second video-tapes, where it is seen that the frequency score of the strong-free flow effort combination has the same low negative correlation of -.60.

Table 11

Relationships Between DASI Children and Effort Combinations of Weight and Flow

Weight and Flow Effort Combinations	Video-tape 1	Video-tape 2
Strong-Bound Flow	.00	.00
Frequency Score	.00	.00
Light-Bound Flow	.00	—
Frequency Score	.00	—
Strong-Free Flow	-.60*	-.50
Frequency Score	-.60*	-.60*
Light-Free Flow	-.12	-.36
Frequency Score	-.36	-.36

*p < .10
**p < .05
***p < .01

The second major problem concerning the DASI children involved the relationship between DASI and the four time and flow effort combinations which were (a) sudden-bound flow, (b) sustained-bound flow, (c) sudden-free flow, and (d) sustained-free flow. It may be seen from Table 12 that the highest time and flow relationship with DASI, on video-tape 1, was observed with the sudden-free flow efforts. Both the effort combination and frequency score yielded negative correlations of -.83, significant at the .05 level of confidence. This relationship suggests that the DASI children tend not to use sudden-free flow efforts. Their movement patterns tend not to include explosive, on-going movements which are characteristic of sudden-free flow effort combinations.

It is of interest to note on the first set of video-tapes, that a negative correlation of -.76 was found for the sustained free flow effort combination and frequency score. These negative correlations were significant at the .05 level of confidence which indicates, that in addition to the DASI children not using sudden-free flow efforts as noted above, they also tend not to use sustained-free flow effort combinations. It may be seen from Table 12 that the second set of video-tapes supported, to a degree, the observations from the first set of video-tapes about the sustained-free flow effort combination. A low -.60 correlation, significant at the .10 level of confidence, was noted for the sustained-free flow effort combination. This low correlation was the only significant correlation found for the second video-tapes on the time and flow relationships with DASI.

Table 12

Relationships Between DASI Children and Effort Combinations of Time and Flow

Time and Flow Effort Combinations	Video-tape 1	Video-tape 2
Sudden-Bound Flow	.00	.40
Frequency Score	.00	.50
Sustained-Bound Flow	-.62*	.00
Frequency Score	-.62*	.00
Sudden-Free Flow	-.84**	-.36
Frequency Score	-.84**	-.36
Sustained-Free Flow	-.76**	-.60*
Frequency Score	-.76**	-.50

*p < .10
**p < .05
***p < .01

The final problem analysed for this study involved the relationship between DASI and the 16 individual efforts derived from the 4 effort combinations of weight and flow and 4 effort combinations of time and flow. The data involving the 16 individual efforts are displayed in Table 13. It is of interest to note on the first set of videotapes that the free flow effort is repeatedly significant at the .05 level of confidence, the one exception being the relationship between light and free flow efforts which were not significant. The negative correlations for the free flow effort ranged from -.76 for the free flow effort in both the strong-free flow and sustained-free flow combinations

Table 13

Relationships Between DASI Children and Sixteen Individual Efforts from Weight and Flow and Time and Flow

Individual Effort Factors	Video-tape 1	Video-tape 2
Strong	.00	.00
Bound Flow	.00	.00
Light	.00	-
Bound Flow	.00	-
Strong	-.60*	-.36
Free Flow	-.76**	-.60*
Light	-.12	-.36
Free Flow	-.25	-.36
Sudden	.00	.40
Bound Flow	.00	.40
Sustained	-.62*	.00
Bound Flow	-.62*	.00
Sudden	-.60*	-.36
Free Flow	-.84**	-.36
Sustained	-.76**	-.60*
Free Flow	-.76**	-.36

*p $\lhd$ .10
**p $\lhd$ .05
***p $\lhd$ .01

to a -.84 correlation on the sudden-free flow combination. The fact that a negative correlation, significant at the .05 level of confidence, is observed repeatedly on the individual free flow effort suggests a distinct tendency for the DASI group not to engage in free flow efforts.

It may be seen from Table 13 that the second set of video-tapes provided only two statistically significant correlations. These low negative correlations were significant at the .10 level of confidence. The -.60 correlation for the free flow effort in the strong-free flow effort combination tends to support the observation made from the first set of video-tapes where the children did not use the free flow effort in their movement patterns. The second low negative correlation of -.60 was noted for the sustained effort from the sustained free flow effort combination. This correlation supports the findings of the first video-tape where a slightly higher -.76 correlation was seen for the sustained effort. Again, the suggestion is, as noted for data in Table 12, that sustainment which is the effort quality that indulges in the use of time is not characteristic of DASI children.

Discussion

The number of statistically nonsignificant correlations found tend to suggest that the movement behavior of children does not reflect the anxiety which may be present. It may be true that, although the anxiety of the subjects of the study was measurable, the children were not functioning at anxiety levels marked enough to affect their gross movements, particularly as that movement was defined by the effort qualities. In addition, when children are as old as 8 to 11 years, their spontaneous play has become so formalized that the activities they do, dictate the

type of movement patterns used. North (1972) noted that the more mechanical a movement became, the "less actual emotional content is involved" (p. 244). This would suggest that spontaneous activities which become mechanical in nature, such as kicking a ball, may be devoid or limited in the expressive use of the efforts which are characteristic of an individual's movement patterns.

Another explanation for the outcome of the study may stem from the design applied. Once the high anxiety children had been identified, the design required that the subjects be subdivided into two types of anxiety groups, DAST and DASI. Such a requirement may have affected the results because the number in each of the final groups was small. The discriminating power of the tests with groups as small as the ones observed may have been reduced. Very fine lines of demarcation had to be drawn when the Index of Graphic Constrictiveness-Expansiveness and the sociometric measures were applied.

In addition to the possibility of the design and assessment instruments influencing the outcomes of the study, observations of the judges may have been involved. Although acceptable levels of intra-and inter-judge reliability were obtained, the fact that the relationship between the two video-tapes was low, may indicate some inconsistencies present, either in the children or in the judges, which were not apparent from the reliability and objectivity found. Certainly North's (1972) statement that the effort combinations were observable and could be recorded, was true for this study; however, North's belief that an individual displays the same movement patterns on repeated observations was not supported.

The first set of video-tapes appeared to offer more information than the second set did. A suggestion made by the judges at the conclusion of their work might have aided in the observation process for the two sets of video-tapes. They suggested that the task of observing the movement patterns would be simplified if the movements were divided into a postural category and a gesture-type category. Each category would be observed and analyzed for the effort combinations used.

Another explanation for the discrepancy between the observations of the two sets of video-tapes may be found in Loo's (1972) work. Loo stated that environmental surroundings influence the motor behavior of children. Several environmental factors could have influenced this study: for example, extreme heat and humidity on different days, variety in the activities engaged in by the children, and the fact that two different locations were used.

The study did demonstrate that it was feasible for movement patterns to be observed and recorded on video-tape. Although recordings were made on two different occasions, there were some efforts which did not appear, namely light-bound flow, indirect-bound flow, and sudden-bound flow. A possible reason for the absence of certain movement patterns in a child's movement vocabulary may be found in Blumer's (1936) explanation. He suggested that children learn gestures and movement expressions as they mature. Although Blumer did not state by what age children learn the non-verbal language of their society, it is possible that some children from this study, in the age range of 8 to 10 years, have not yet developed their full range of learned gestures and movement expressions.

A positive correlation coefficient of .63, significant at the .10 level of confidence, was found for the strong bound flow effort combination of the DAST children, North (1972) described strong-bound flow movements as "cramped with tension" (p. 251). Fischer (1970) reported that muscle tension was one characteristic of anxious individuals. An indication of anxiety may have been seen therefore, in the strong-bound flow effort combinations displayed by the DAST children.

North (1972) reported that light-free flow effort combinations displayed sensitive ease and buoyancy. North believed also, that in order for an individual to have a "balanced emotional life," they must use contrasting effort combinations, for example, strong-bound flow efforts and light-free flow efforts (p. 241). Although the DAST children have shown that they use strong-bound flow efforts, a -.95 correlation coefficient significant at the .01 level of confidence, indicates that the same children tend not to use the contrasting light-free flow effort combinations. According to North, this would suggest an imbalance in the DAST children's "emotional life."

The effort combinations which were significant for the DAST group of children were: strong-free flow, sustained-free flow, sudden-free flow, and sustained-free flow. The correlations, however, were negative suggesting a lack of use of these efforts. North (1972) stated that the effort flow showed the ease or restraint of an action. Possibly it was the lack of restraint or the ease of action which was being described by Thompson (1962), and Johnson and Medinnus (1965) when they stated in general terms that anxiety is described as withdrawn, restless and flight reaction.

Time was the effort which, according to North (1972), indicated decision. The DASI group showed a significant relationship between their anxiety and sustained-bound flow, sustained-free flow, and sudden-free flow effort combinations. The correlations were all negative indicating a lack of use of the effort time. The question is: Is decision as explained by North (1972) the element recognized in such descriptions of anxiety as angry outbursts, inactivity, and withdrawn behavior (Thompson, 1962 ; Johnson & Medinnus, 1965)? The descriptions by the above researchers are so general that it is possible to make the error of reading too much into the pictures they have drawn; however, as was evidenced by the children's behavior on the video-tapes, three of the subjects who were classified as DASI would answer the general description of being withdrawn and inactive. Three other children, two in the DASI group and the other a DAST child would answer the general description of restless.

Although there was not overwhelming evidence in this study to show that relationships between anxiety and the effort combinations of weight and flow and time and flow existed, there was sufficient evidence to suggest that more research should be done in this area.

CHAPTER V

CONCLUSIONS

The purpose of this study was to examine the relationships between children's anxiety, as defined by the selected tests, and movement patterns observed through the effort combinations of weight and flow, and time and flow.

The investigation required that literature in the areas of anxiety and non-verbal behavior be reviewed. The summary of anxiety theories focused on the construct of anxiety as a basic characteristic common to the experience of most people. Psychoanalytical, "trait-state," and developmental explanations were presented. The research of Doyal and Forsyth (1973), Duffy and Martin (1973), Hill and Sarason (1966), and Speilberger and Diaz-Guerrero (1976), reporting the application of Sarason's General Anxiety Scale for Children among others, found that anxiety was experienced in varying degrees by children and that it can be measured.

Literature involving non-verbal communication was reviewed selectively. Attention was focused on non-verbal behavior as it occurred either within children or within the environment of children. Investigations concluded that non-verbal communication had an important effect on behavior.

Studies and articles describing the manifestations of anxiety, and techniques and methods for observing and recording non-verbal

behavior were reviewed (Birdwhistell, 1970; Ekman & Friesen, 1969; Gaudrey & Spielberger, 1971; North, 1972; Scheflen, 1964; Smith, Irwin & Sarason, 1975; Watson, 1970). North's method of recording effort combinations suggested a viable approach for this study to follow.

The 10 subjects included in the study were identified from a source of 44 children according to scores they obtained on the General Anxiety Scale for Children, the Index of Graphic Constrictiveness-Expansiveness, and a sociometric test. The 10 subjects were divided into 2 groups of 5 children each. One group was identified as DAST; the other group was designated as DASI. Three trained judges observed the video-tapes of the 10 children, and rated the frequency and intensity of the weight and flow and time and flow effort combinations, and individual efforts. The data were analysed through the application of the Kendall rank correlation coefficient.

Major Results

1. A significant positive correlation coefficient was found for the relationship between DAST children's anxiety and the strong-bound flow effort combination.

2. Significant negative correlation coefficients were found for the relationships between DAST children's anxiety and the light-free flow, and sudden-free flow effort combinations.

3. Significant negative correlation coefficients were noted for the relationships between the DASI children's anxiety and strong-free flow, and sustained-free flow effort combinations.

4. Significant negative correlation coefficients were found for the relationships between the DASI children's anxiety and the individual efforts of free flow and sustainment.

Conclusions

Every caution should be observed in the interpretation and conclusions to be drawn from the study relative to inferences that anxiety invariably causes given gross movement behaviors. No-cause-and-effect relationships can be stated; however, within the limits of the data the following conclusions appear to be warranted:

1. There is a tendency for high-anxiety children who deny their anxiety with social ties (DAST) to employ strong-bound flow efforts combinations in movement, but not to employ light-free flow nor sudden-free flow effort combinations in movement.

2. There is a tendency for high-anxiety children who deny their anxiety through social isolation (DASI) not to display strong-free flow, sustained-free flow effort combinations nor individual efforts of free flow and sustainment.

3. Either there is no relationship between high anxiety and other weight and flow, time and flow, and individual effort combinations, or the other effort combinations included in the study were not clearly present in the movements of the children observed.

The results tended to show by the negative correlation coefficients, that effort combinations were not used by the children, but what effort combinations they did use, was not clearly shown. Although this was an

exploratory study, the trends found in the data should be of value in promoting the interest of future investigators in pursuing the examination of children's movement patterns as they related to anxiety.

Recommendations

The following recommendations are suggested for future studies:

1. Examine the movement patterns by observing both the postural and gesture-type movements.

2. Establish control over the environmental setting of the spontaneous play situation; use one location, or make the play activities uniform.

3. Repeat the study with younger children whose spontaneous play may be less formalized, or repeat the study in an environmental setting that will encourage more expressive behavior.

4. Increase the number of subjects involved in the study so that the opportunity for seeing relationships, if any exist, is increased by broadening the spectrum under examination. The latter suggestion could be accomplished by selecting a group of children with high levels of anxiety as well as selecting a second group of children with low levels of anxiety. The comparison of the movement patterns for each group could be made, and the results related to the anxiety scores of each group.

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APPENDIX A

Instructions for the General Anxiety Scale for Children

I am going to be asking you some questions - questions different from the usual school questions, for these are about how you feel and so have no right or wrong answers. First, turn over the top page on your desk that has number one to forty-five on it. Yes and no are written beside each number.

Write your name at the top of the page, both your first and your last name . . . Also write a B if you are a boy, and a G if you are a girl.

No one but myself will see your answers to these questions, not your teacher or your principal or your parents. These questions are different from other questions that you are asked in school because there are no right or wrong answers. You are to listen to each question, and then put a circle around either "yes" or "no." For example, if I asked you this question: "Do you like to play ball?" some of you would put a circle around "yes" and some of you would put a circle around "no." Your answer depends upon how you think and feel. These questions are about how you think and feel about school and a lot of other things. Remember, listen carefully to each question and answer it "yes" or "no" by deciding how you think and feel. If you don't understand a question, ask me about it. Now let's start by everyone putting his finger on number 1. Here is the first question. When you have circled your answer, place your pencil on the desk.

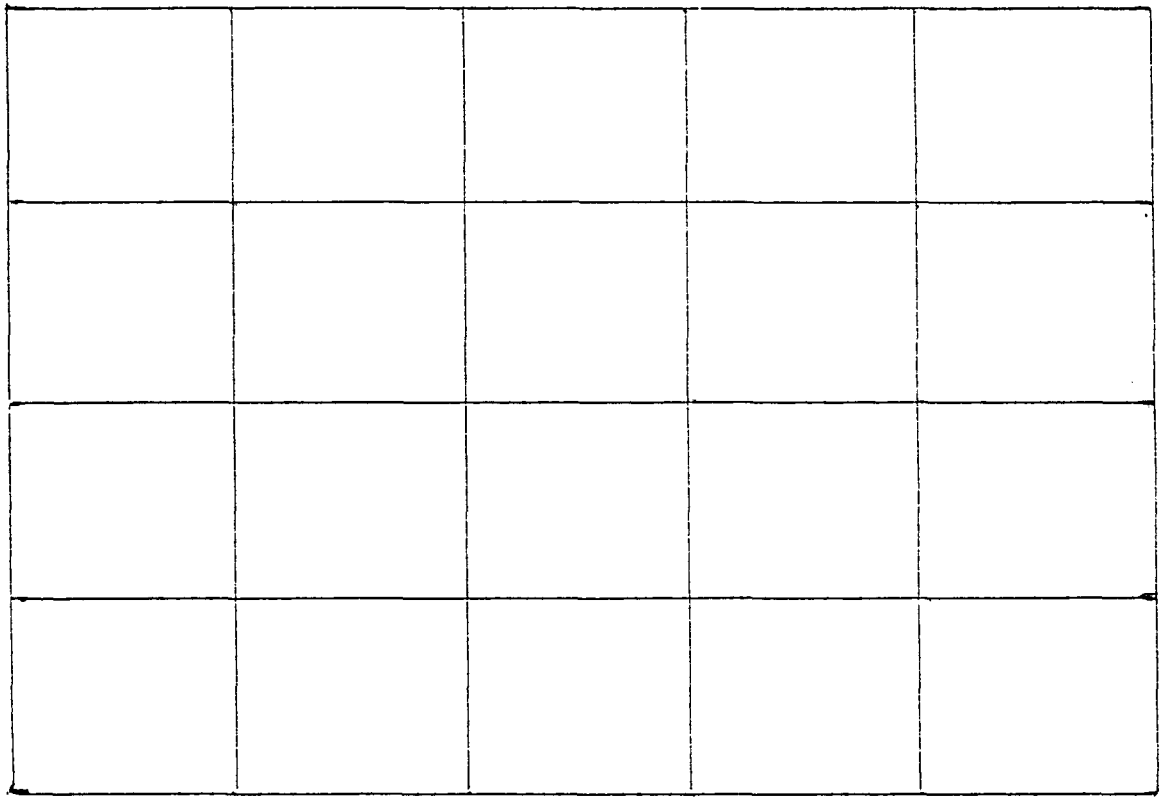
Answer Sheet for General Anxiety Scale for Children

Name _____

1. yes ... no
2. yes ... no
3. yes ... no
4. yes ... no
5. yes ... no
6. yes ... no
7. yes ... no
8. yes ... no
9. yes ... no
10. yes ... no
11. yes ... no
12. yes ... no
13. yes ... no
14. yes ... no
15. yes ... no
16. yes ... no
17. yes ... no
18. yes ... no
19. yes ... no
20. yes ... no
21. yes ... no
22. yes ... no
23. yes ... no
24. yes ... no
25. yes ... no
26. yes ... no
27. yes ... no
28. yes ... no
29. yes ... no
30. yes ... no
31. yes ... no
32. yes ... no
33. yes ... no
34. yes ... no
35. yes ... no
36. yes ... no
37. yes ... no
38. yes ... no
39. yes ... no
40. yes ... no
41. yes ... no
42. yes ... no
43. yes ... no
44. yes ... no
45. yes ... no

Instructions for Index of Graphic Constrictiveness - Expansiveness

"I'd like you to draw designs on this paper for me. You may draw whatever designs you feel like drawing, but I do not want you to draw things like people or houses or animals or anything like that - just draw designs; whatever designs you feel like drawing. Begin when I say start and stop when you hear the word stop."



Scale: 1/3 size of original size

Figure 1. Scale model of grid for scoring Index of Graphic Constructiveness-Expansiveness.

Instructions for Sociometric Test

"I would like you to help me with something to-day. I want to play some games with your class and we're going to play these games in groups. You can help me arrange groups that play best together. You can do this by telling me the names of children you would like to have in your play group. Choose anyone in your classroom whom you want, including anyone who might be absent to-day. You can make as few or as many choices as you wish, but make your choices carefully, so that when we arrange the play groups, the groups will be just the way you want them. I'm going to keep your choices a secret - no one else will know whom you chose and whom you didn't choose, so you may choose as many or as few people as you really want to be in the play group."

After the children finished choosing, they were asked to keep their choices secret so that no one's feelings would be hurt. They were asked to print their name at the top of the page and turn the sheet of paper over on their desk.

APPENDIX B

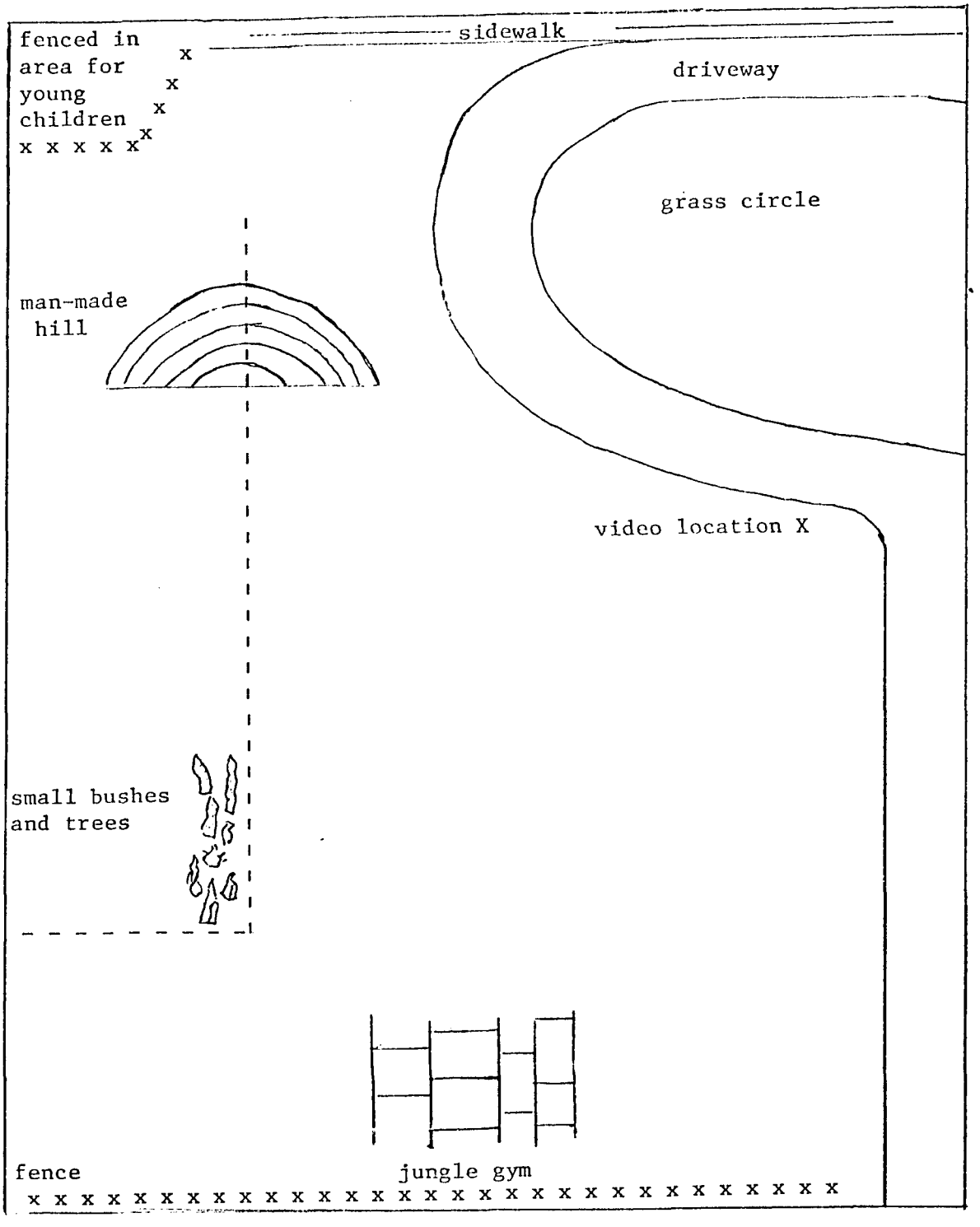


Figure 2. Diagram of children's outdoor playground.

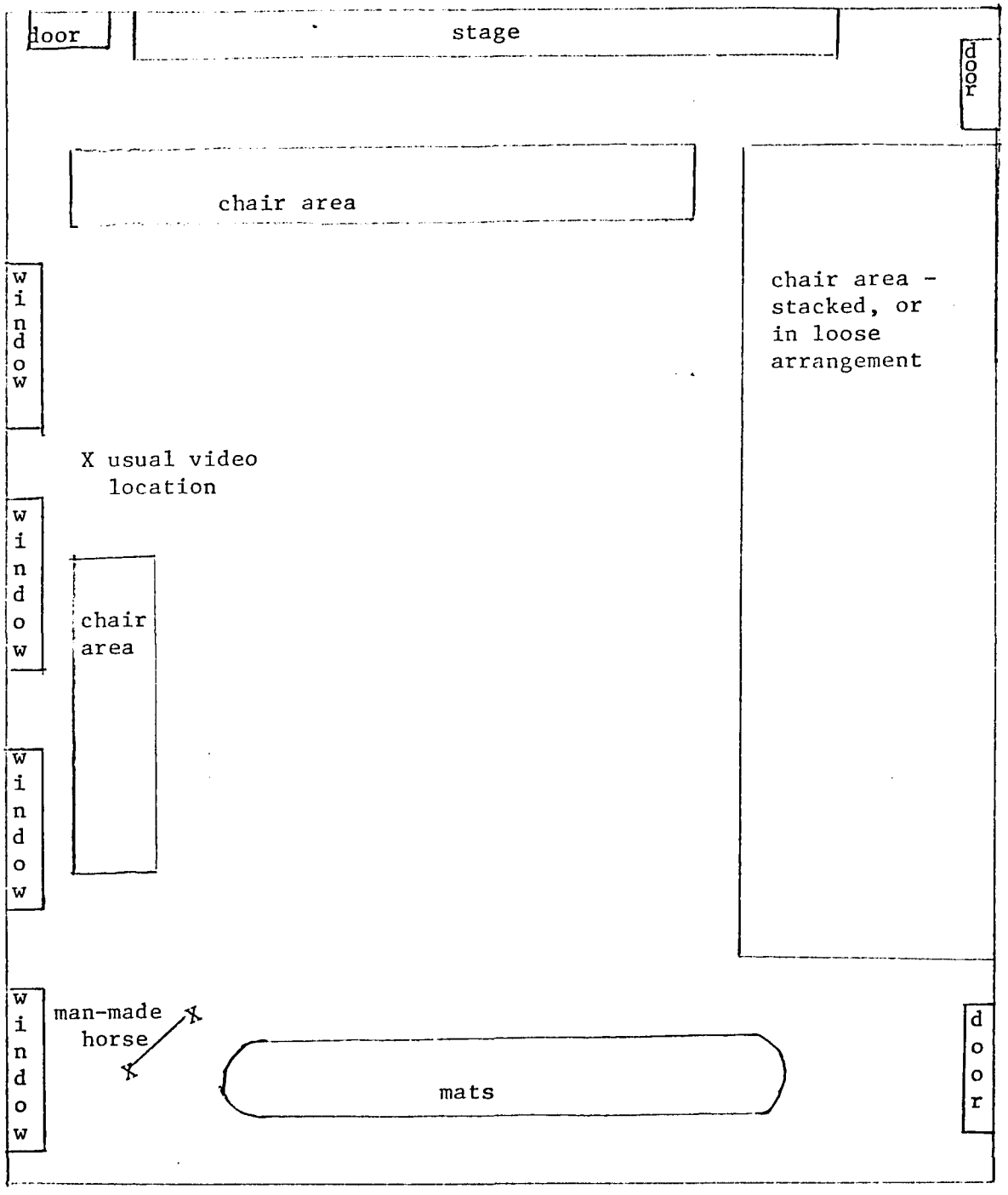


Figure 3. Diagram of children's gymnasium.

APPENDIX C

Table 14

Judges First Recording Chart for Effort Combinations

Weight and Flow	Weight and Time	Time and Flow	Space and Time	Space and Flow	Weight and Space
st - bf	st - sud	bf - sud	d - sud	d - bf	st - d
3 - 1*					
l - bf	l - sud	bf - ss	d - ss	d - ff	st - ind
st - ff	st - ss	ff - sud	ind - sud	ind - bf	l - d
l - ff	l - ss	ff - ss	ind - ss	ind - ff	l - ind

bf = Bound Flow
ff = Free Flow
d = Direct
ind = Indirect
l = Light
st = Strong
sud = Sudden
ss = Sustained

*Example of recording: intensity of strong effort is 3 and intensity for bound flow effort is 1.

Abbreviated Recording System Designed by Judges

Symbols

Bound Flow	=	bf
Free Flow	=	ff
Direct	=	d
Indirect	=	ind
Light	=	l
Strong	=	st
Sudden	=	sud
Sustained	=	ss

An example of a recording:

3		1*
sud	-	1
2		2
st	-	ff
1		2
ss	-	bf
3		2
d	-	ss

* 3 - 1
sud - l = intensity of sudden is three and intensity of light is one

APPENDIX D

Table 15

Inter-Judge Reliability for Training Sessions

	J1 and J2	J1 and J3	J2 and J3	Average
Session 1	.82	.57	.82	.74
Session 2	.82	.67	.82	.77
Session 3	.88	.84	.85	.85

APPENDIX E

Table 16

Intra-Judge Reliability of Ten Subjects

	First Video-taping						Second Video-taping					
	Judge 1		Judge 2		Judge 3		Judge 1		Judge 2		Judge 3	
Subjects	Effort Comb.	Freq. Score	Effort Comb.	Freq. Score	Effort Comb.	Freq. Score	Subjects	Effort Comb.	Freq. Score	Effort Comb.	Freq. Score	Effort Comb.	Freq. Score
1	.83	.85	.80	.82	.88	.85	1	.85	.87	.79	.79	.91	.93
2	.84	.87	.89	.91	.87	.89	2	.85	.89	.76	.76	.83	.85
3	.70	.73	.71	.83	.73	.79	3	.80	.81	.73	.73	.76	.75
4	.69	.70	.75	.78	.72	.73	4	.75	.81	.91	.96	.78	.86
5	.80	.87	.86	.87	.90	.92	5	.87	.91	.79	.83	.81	.86
6	.67	.72	.88	.87	.79	.80	6	.97	.95	.84	.84	.89	.90
7	.78	.79	.85	.88	.65	.65	7	.78	.81	.85	.85	.80	.79
8	.99	.99	.88	.87	.87	.88	8	.72	.73	.79	.84	.66	.71
9	.84	.83	.77	.82	.84	.86	9	.84	.86	.89	.90	.88	.91
10	.94	.95	.94	.94	.97	.97	10	.78	.83	.91	.92	.83	.84

Effort Combination = Effort Comb.
Frequency Score = Freq. Score
$p \leq .001$ applies for all values

APPENDIX F

Table 17

Relationships Between Anxiety Scores and Quality of

Movement Scores of Ten Children

Tape	Weight and Flow				Weight and Time				Time and Flow			
	st - bf		Comb. Effort	Freq. Score	st - sud		Comb. Effort	Freq. Score	bf - sud		Comb. Effort	Freq. Score
1	.34	.38*	.34	.41*	-.15	-.23	-.20	-.09	.00	.00	.00	.00
2	-.03	-.03	-.03	.00	.09	.08	.00	.15	.21	.21	.21	.24
	l - bf		Comb. Effort	Freq. Score	l - sud		Comb. Effort	Freq. Score	bf - ss		Comb. Effort	Freq. Score
1	.00	.00	.00	.00	.38*	.35*	.35*	.33	-.52**	-.52**	-.52**	-.52**
2	-	-	-	-	.15	.25	.15	.30	-.32	-.32	-.32	-.32
	st - ff		Comb. Effort	Freq. Score	st - ss		Comb. Effort	Freq. Score	ff - sud		Comb. Effort	Freq. Score
1	.09	-.08	.03	.05	.13	.13	.09	.08	-.48	-.43	-.48	-.63
2	-.09	-.15	-.13	-.09	.20	.15	.15	.20	-.19	-.19	-.19	-.18

bf = Bound Flow
ff = Free Flow
d = Direct
ind= Indirect

l = Light
st = Strong
sud = Sudden
ss = Sustained

Comb. Effort = Combined Effort
Freq. Score = Frequency Score
*p $\leq$ .10
**p $\leq$ .05
***p $\leq$ .01

Table 17 (cont.)

Relationships Between Anxiety Scores and Quality of

Movement Scores of Ten Children

Tape	Weight and Flow				Weight and Time				Time and Flow			
	l - ff	Comb. Effort	Freq. Score		l - ss	Comb. Effort	Freq. Score		ff - ss	Comb. Effort	Freq. Score	
1	-.33	-.43**	-.38*	-.40*	.25	.20	.25	.33	-.33	-.28	-.33	-.31
2	-.36*	-.43**	-.45**	-.35*	-.05	-.05	-.05	-.25	-.31	-.33	-.33	-.32

Tape	Space and Time				Space and Flow				Weight and Space			
	d - sud	Comb. Effort	Freq. Score		d - bf	Comb. Effort	Freq. Score		st - d	Comb. Effort	Freq. Score	
1	.03	.15	.15	.05	-.31	-.35	-.31	.23	-.05	.00	.00	-.03
2	-.19	.05	-.25	-.05	.00	.03	.00	.06	-.03	.00	.00	-.05
	d - ss	Comb. Effort	Freq. Score		d - ff	Comb. Effort	Freq. Score		st - ind	Comb. Effort	Freq. Score	
1	.50**	.50**	.50**	.50**	-.60***	-.63***	-.62***	-.62***	-.25	-.15	-.25	-.20
2	.18	.15	.30	.23	-.15	-.09	-.09	-.18	.18	.15	.15	.23

bf = Bound Flow
ff = Free Flow
d = Direct
ind = Indirect
l = Light
st = Strong
sud = Sudden
ss = Sustained
Comb. Effort = Combined Effort
Freq. Score = Frequency Score

*p .10
**p .05
***p .01

Table 17 (cont.)

Relationships Between Anxiety Scores and Quality of

Movement Scores of Ten Children

Tape	Space and Time				Space and Flow				Weight and Space			
	ind - sud		Comb. Effort	Freq. Score	ind - bf		Comb. Effort	Freq. Score	l - ind		Comb. Effort	Freq. Score
1	-.25	.20	-.20	-.18	-	-	-	-	.10	.25	.15	.23
2	.08	-.18	.10	.05	-	-	-	-	.25	.15	.25	.25
	ind - ss		Comb. Effort	Freq. Score	ind - ff		Comb. Effort	Freq. Score	l - ind		Comb. Effort	Freq. Score
	.18	.13	.15	.13	-.25	-.25	-.25	-.25	-.13	-.18	-.20	-.08
	-.15	-.15	-.15	-.15	-.65***	-.60***	-.60***	-.65***	-.25	-.33	-.30	-.33

bf = Bound Flow
ff = Free Flow
d = Direct
ind = Indirect

l = Light
st = Strong
sud = Sudden
ss = Sustained

Comb. Effort = Combined Effort
Freq. Score = Frequency Score
*p ◁ .10
**p ◁ .05
***p ◁ .01

Table 18

Relationships Between DAST and

Undesignated Effort Factors

Weight and Time

	Strong	Light	Sudden	Sustained	Combined Effort	Frequency Score
Tape 1	.11		-.11		-.11	.32
Tape 2	.11		.11		.11	.32
Tape 1		.53*	.53*		.53*	.44
Tape 2		.53*	.53*		.53*	.53*
Tape 1	.11			.11	.11	.11
Tape 2	.32			.32	.32	.32
Tape 1		.11		.11	.11	.11
Tape 2		.00		-.11	-.11	-.11

Space and Time

	Direct	Indirect	Sudden	Sustained	Combined Effort	Frequency Score
Tape 1	.11		.11		.11	-.11
Tape 2	-.11		.11		-.11	.11
Tape 1	.53*			.53*	.53*	.53*
Tape 2	.32			.32	.32	.32
Tape 1		-.95**	-.74**		-.74**	-.67*
Tape 2		-.11	-.32		-.32	-.32
Tape 1		.00		.00	.00	.00
Tape 2		-.32		-.32	-.32	-.32

*p $\leq$.10
**p $\leq$.05
***p $\leq$.01

Table 18 (cont.)

Relationships Between DAST and

Undesignated Effort Factors

Space and Flow

	Direct	Indirect	Bound Flow	Free Flow	Combined Effort	Frequency Score
Tape 1	-.25		-.25		-.25	-.25
Tape 2	-.35		-.27		-.35	-.27
Tape 1	-.95***			-.95***	-.95***	-.95***
Tape 2	.32			.32	.32	.22
Tape 1		-	-		-	-
Tape 2		-	-		-	-
Tape 1		-.53*		-.53*	-.53*	-.53*
Tape 2		-.74**		-.74**	-.74**	-.74**

Weight and Space

	Strong	Light	Direct	Indirect	Combined Effort	Frequency Score
Tape 1	.11		.11		.11	.11
Tape 2	.32		.32		.32	.32
Tape 1	-.53*			-.53*	-.53*	-.53*
Tape 2	.53*			.32	.32	.53*
Tape 1		.32	.32		.32	.53*
Tape 2		.32	.32		.32	.32
Tape 1		-.53*		-.53*	-.53*	-.44
Tape 2		-.11		-.11	-.11	-.11

*p $\leq$ .10
**p $\leq$ .05
***p $\leq$ .01

Table 19

Relationships Between DASI and

Undesignated Effort Factors

	Weight and Time					
	Strong	Light	Sudden	Sustained	Combined Effort	Frequency Score
Tape 1	-.60*		-.60*		-.60*	-.60*
Tape 2	-.12		-.50		-.60*	-.12
Tape 1		.60*	.60*		.60*	.60*
Tape 2		-.12	-.13		-.12	-.13
Tape 1	.12			.12	.12	.12
Tape 2	-.12			-.13	-.12	-.12
Tape 1		-.36		.36	.36	.76**
Tape 2		-.25		-.12	-.12	-.60*

	Space and Time					
	Direct	Indirect	Sudden	Sustained	Combined Effort	Frequency Score
Tape 1	-.25		.36		.36	.12
Tape 2	-.36		.12		-.36	-.12
Tape 1	.60*			.60*	.60*	.60*
Tape 2	-.84**			-.36	-.60*	-.88**
Tape 1		.36	.50		.36	.36
Tape 2		.63*	.60*		.60*	.25
Tape 1		.50		.50	.50	.50
Tape 2		.25		.25	.25	.25

*p $\leq$ .10
**p $\leq$ .05
***p $\leq$ .01

Table 19 (cont.)

Relationships Between DASI and

Undesignated Effort Factors

	Space and Flow					
	Direct	Indirect	Bound Flow	Free Flow	Combined Effort	Frequency Score
Tape 1	-.50		-.40		-.50	-.25
Tape 2	.50		.50		.50	.50
Tape 1	.71*			-.71*	-.71*	-.71*
Tape 2	-.36			-.36	-.36	-.36
Tape 1		-	-		-	-
Tape 2		-	-		-	-
Tape 1		.36		.36	.36	.36
Tape 2		-.60*		-.60*	-.60*	-.60*

	Weight and Space					
	Strong	Light	Direct	Indirect	Combined Effort	Frequency Score
Tape 1	-.36		.12		-.12	.12
Tape 2	-.36		-.12		-.12	-.36
Tape 1	.12			.36	.12	.36
Tape 2	-.12			-.12	-.12	.00
Tape 1		.12	.36		.36	.36
Tape 2		.36	.36		.36	.36
Tape 1		.50		.25.	.36	.50
Tape 2		-.60		-.63*	-.60*	-.60*

*p $\leq$ .10
**p $\leq$ .05
***p $\leq$ .01