THE MEASUREMENT OF BODY AWARENESS OF SEVENTH, EIGHTH, AND NINTH-GRADE GIRLS AND A COMPARISON OF THIS AWARENESS TO THEIR ABILITY TO PERFORM TWO CROSS MOTOR TASKS

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CHAPTER I

INTRODUCTION

For many years the process of education has been studied and evaluated by psychologists, sociologists, and educational leaders. In the last half of this century the major objective of the American school system has been to educate the "total or whole" individual. In educating the "total or whole" child, we are concerned not only with helping him master the skills of English, Mathematics, Science, and History, but also with aiding the preparation of the student to meet the many different situations he will face in life. In preparing him for the tasks of living, leaders attempt to provide the child with experience in problem solving and decision making. Bereday and Volpicelli defined the objectives of education as being the development of the following qualities within the student:

1. An understanding of our changing world, communities, and cities.
2. High ideals and understanding of values.
3. Proficiency in such skills as writing, reading, speaking, listening, and observing. Along with these a basic skill in using numbers is also important.
4. Ability in reflective thinking as applied to economical, political, and social matters such as personal problem solving (1, pp. 119-120).
The desired result of the educational program is to produce an individual who is able to perform a "specialized job" and live compatibly with those around him. As time has passed and educational methods and objectives have begun to change, it has become of increasing importance to recognize and study all aspects of the personality. With the acceptance of psychological theory has come the recognition of its importance. The applied psychology used by the teacher has become more important and more necessary.

The personality of the student and the variables that effect the formation of this personality are extremely important in determining the method used to teach the child. As educators we are becoming more concerned with every aspect that effects the development of the personality and the performance of the student.

Investigators have hypothesized that the degree of body perception affects, not only the type of activity a person chooses to perform, but also affects the degree of performance in the activity. Fisher and Cleveland made these statements in regard to body areas and selected activities:

Some areas of the body may be persistently in the forefront of awareness and others may be denied to the point where they almost do not exist in a perpetual sense. Body anxiety appears to have the consequences for encouraging long-time modes for behavior. For example, boys with high body anxiety were found to avoid athletic activities and to invest an increasing proportion of their time in intellectual tasks (3, pp. 48-49).
In another study carried out by Fisher and Cleveland (3), it was shown that an individual's perception of his body and body size may be affected by the nature of his attitude toward himself and his body. Studies have indicated that an individual's perception of his body size may also affect such variables as his ability to make intellectual judgements and independent decisions. At the psychological level, it was demonstrated in experiments that in normal subjects, "the individual with definite body boundaries was autonomous, active, independent, and communicative" (3, p. 51).

Cratty (2) pointed out that many children in adolescence have problems of relating to the environment and to their changing bodies. After his observation and study, he made the following conclusions:

Children in early adolescence exhibit restricted and tense movements because they suffer feelings of inferiority about their changing bodies. The extent to which adolescents are comfortable with the size and shape of their bodies and their willingness to engage in a variety of movement tasks, particularly those involving amounts of space, are apparently closely related (2, p. 17).

Body size and proportion are in a constant state of change during adolescence and thus the adolescent female from the age of eleven through fourteen is constantly developing and changing in terms of physiological and
psychological maturation. During this period, the youth is primarily concerned with being accepted by his peers and identifying with a peer group. The appearance and characteristics of the body play an important part in the ultimate acceptance or rejection of the child.

Statement of the Problem

It is clearly shown in the literature that body awareness is of great importance. Research concerned with the study of this subject is destined to open many new areas of investigation. The study of body awareness and the further study of the effects it exerts on the individual is of extreme importance when evaluating learning ability. As physical educators we are primarily concerned with the aspects of the personality that influence the performance of motor skills. It seems that "body awareness" could exert no greater force on any field of learning than that of physical education. If we as physical educators are to provide an adequate learning experience for our students, we must study all of the aspects of the personality that affect the learning processes of the child.

Purpose of the Study

The purpose of this study is to determine the relationship between body awareness and the ability of junior high
school girls to perform gross motor tasks. Specifically, the study sought to answer the following questions:

1. Is there a relationship between total body awareness and performance on two gross motor tasks?

2. Is there a relationship between the degree of body awareness toward the arm area and the ability to perform a task of hitting?

3. Is there a relationship between the amount of body awareness of the leg area and the ability to perform a task of kicking?

4. Is there a significant difference in the degree of body awareness at different grade levels?

5. Is there a significant difference in performance of gross motor tasks between the grade levels?
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CHAPTER II

REVIEW OF LITERATURE

The research conducted in the field of body awareness has involved a large number of approaches. In each case, the major objective of the studies was to determine the degree or amount of body awareness of a specific sample of people, and determine the importance of this body awareness to performance of a large number of different tasks. The work has been done in fields such as these: schizophrenia, sensitivity and reactivity, psychosomatic illnesses, and the direction of stimuli to inward and/or outward body areas.

In order to report adequately on each area of study that has been done, the investigator has elected to divide the review of literature into three categories. The first will concern studies of body image and body awareness in the field of psychology. The second will contain material reviewed that pertains to general education. The last will include information pertaining to the field of physical education.
In the field of Body Image and Body Awareness, studies have been conducted to investigate the relationship of body awareness and perceived size of body parts.

Werner, Wapner, and Comalli (19) completed a study to determine the relationship between body boundary perception and the effect it has upon the subject's estimation of his head size. Twelve subjects were required to indicate the width of their heads under two different conditions. The findings suggest that lack of a clear boundary between head and environment is one factor making for over-estimation of head size.

Fisher (10) conducted four studies designed to test the relationship of definiteness of the body image boundaries to patterns of sensation from internal and external body regions. A total of 353 normal subjects were tested. Two hundred and forty of the subjects were female and 115 were males. It was found that the more definite the subject's body image the more likely he was to assign prominence to the body exterior as compared to the body interior.

Another study was conducted by Zinny (20) to test the relationship between definiteness of body image boundaries and exterior and interior body reactivity. In order to test
his theory, barrier and penetration scores were obtained from twenty-four college sophomore girls. The hypothesis was stated that normal subjects with definite boundaries manifest relatively high reactivity in muscles and skin and low reactivity to interior sights. He further hypothesized that the reverse pattern would be followed for those with indefinite boundaries. Measurements were also taken of heart rate and skin resistance preceding and during performance of a rotary task. The results indicate that only during the anticipatory stress period was the hypothesis reinforced.

In a research project conducted by Davis (3), fifty normal male subjects were evaluated on nine physiological measures which were administered under conditions of rest and stress. These measures were investigated in order to test the hypothesis that the projected perception of one's body is related to the patterning of physiological responses. The results indicated that the tendency to give impermeable and protective characteristics to Rorschach percepts is related to heightened physiological reactivity at an interior body site.

The absence of these characteristics is related to higher physiological responses on interior indices of physiological response under stress.
In other research studies in the field of psychology, the subject of reactivity has been investigated.

Fisher (7) conducted a study to investigate the problem of right versus left reactivity. Fifty normal subjects were tested. Thirty-four were men and sixteen were women. The findings failed to confirm a previous finding regarding the relationship of body image right-left asymmetry and GSR directionality. A significant relationship was established between a figure drawing measure of the individual's concept of the relative size and strength attributes of the male and female roles and GSR reactivity gradients. The findings lend support to the general theory that relates role, body image, and physiological reactivity.

In a two part study conducted by Fisher (8), the problem was to establish that the reactivity of the front of the body to the back of the body is significantly associated with the relative size or importance assigned to each of these sectors in the body image schema. In phase one the aim was to extend the generality of findings by applying them to a dimension which involves the front of the body versus the back of the body. As hypothesized, it was found that the ratio of front skin resistance to back skin resistance was significantly related to the body image valuations applied to these areas. In phase two the study
sought to demonstrate that the individual's mode of front-back differentiation was linked with his degree of imaginative spontaneity in interpreting stimuli. Only slight support for the second hypothesis was found.

Fisher and Abercrombie (9) have done a study concerned with body image distortions and body reactivity. It was hypothesized that right-handed subjects showing relatively more GSR reactivity on the left side of the body than on the right, would manifest fewer body image distortions than right-handed subjects showing either right GSR directionality or no gradient at all. After testing sixty-two subjects the results definitely supported the proposed hypothesis. The data provided additional confirmation for the proposition that the individual's body image attitudes may influence his patterns of physiological reactivity.

In still another study conducted by Fisher (5), the hypothesis was proposed that the more definitely an individual distinguished the right and left sides of the body in his body image, the more likely he is to manifest differential reactivity in the left versus right sides of his body. Forty male and thirty-two female subjects were tested. The results indicated that in the right-handed subjects, those distinguishing their right and left body sides were likely to show a GSR gradient such that the left side was more
reactive than the right side. Those without a clear cut body-image distinction between the right and left body sides showed no GSR gradient and were predominantly right reactive. This study provides further support for the above study conducted by Fisher.

Another field of body awareness investigation is concerned with the body image changes that occur as a result of severe changes in body proportion and/or size.

McConnell and Datson (15) have investigated the changes that occur during pregnancy. Three tests were administered to twenty-four pregnant women. The test results indicated that attitudes toward pregnancy seemed to be significantly related to the way one evaluates one's body and the degree of invulnerability of body image boundaries. Pregnancy was associated with increased penetration fantasies. The decrease was sufficient following parturition.

Jourard and Secord (14,17) have conducted two major studies concerned with body cathexis. The first study was designed to develop a method for appraising the feelings of an individual toward his body and to ascertain whether or not variables derived from these appraised feelings are significant for personality theory. The test was administered to a group of college men and women and significant findings were uncovered to support three of
the four proposed hypotheses. The second study was designed to measure relationships between body cathexis rating on three body parts and expression of the size of those parts. Sixty female students were tested. Conclusions demonstrated the existence of a shared ideal for certain dimensions of the female figure. With the exception of bust measurement, the dimensions were smaller than the actual body measurement.

The most extensive study of body image has concerned schizophrenic patients. Most of the investigators have attempted to determine how schizophrenic reactions affect body image perception.

Burton and Adkins (2) have studied the perceived size of body parts in schizophrenic patients. Conclusions of the study indicate that the schizophrenic patients perceive parts of their body in a more exaggerated fashion than non-schizophrenic patients. The investigators pointed out that the results may have been somewhat affected by the libidial and interactive forces that they defend.

Fisher and Seidner (11) did another study which investigated the body experiences of thirty schizophrenic, twenty-eight neurotic, and twenty-five normal women. The purpose of the study was to determine if the women differed
in their reports of distorted body image experiences. No difference in degree of body consciousness was found between the groups.

Rausch (16) has studied the degree of size constancy perception in schizophrenics. The subjects included thirty paranoid schizophrenics, thirty non-paranoid subjects, and thirty college students. The hypothesis was proposed and supported that paranoids would show a higher constance of scores than normal subjects. The hypothesis that non-paranoid schizophrenic patients would show lower constance than normals was not confirmed.

Education

Leaders in education have long been concerned with the factors that effect a child's ability to learn. For this reason, educational leaders and psychologists have become increasingly interested in the study and investigation of the body image phenomenon.

Hershensen (13) investigated the relationship of arithmetic ability to the degree of body image awareness of the hands. As shown in human figure drawing, the WAIS protocols of 160 college students were used. Arithmetic ability (WAIS arithmetic as highest verbal subtest score) was significantly related to the accuracy of hands (five
fingers in human figure drawing). No relationship was found between objective asymmetry of hand and arithmetic ability.

Fisher (4) has further indicated the hypothesis "that the greater an individual's awareness of his own body in relation to the total perceptual field, the more likely he is to display selectivity for recall of words referring to the body" (4, p. 139). The results were based on the test of ninety-two subjects. The proposed hypothesis was supported.

Physical Education

It seems that the phenomenon of body image and body awareness should concern no field of education more than that of physical education. Very little has been done in this field to investigate the phenomenon and the effects that it may exert on students to learn and perform motor tasks.

In reference to physical education, Herod (12) has stated:

Literature in neurology, physiology, psychology, psychoanalysis, and retardation has been collected and reviewed. This material has indicated that body image is continually changed and developed. Its development is affected by tactile and kinesthetic sensations. The responses that are elicited from the sensations are dependent on social and cultural factors. It seems that the behavior of the individual is influenced by the security of the body image. The major implication in physical education
should be to broaden its scope to include the sensory motor experiences. Use of these experiences would serve well to develop a strong and secure body image (12, p. 31).

Armstrong and Armstrong (1) investigated the effect of body image awareness in adolescent boys and girls. After administration of the Fisher-Cleveland Barrier Index, their results indicated that there was a definite relationship between physical fitness and the perception of body boundaries for adolescent girls, but not for boys.

Vincent and Dorsey (18) conducted a study designed to investigate the relationships between three measures of physiological performance. The investigators concluded that a general relationship does not exist between the measure of body image and physiological performance. These statements were included in the summary: "We feel that clinical findings justify the identification of some phenomenon or configuration. What seems to be critical at present is the creation of a more adequate measure of body image" (18, p. 1101).


7. "Body Reactivity Gradients and Figure Drawing Variables," Journal of Consulting Psychology, XXIII (February, 1959), 54-59.


CHAPTER III

PROCEDURES

The greatest amount of "body awareness" investigation has involved subjects of college age and maturity. It seems that the most effective measure of "body awareness" will result from testing subjects that are in the process of achieving mental and physical maturity. Female junior high students vary extremely in mental maturity, physical development, and in personal appearance. It seems that this is one of the most critical times of adjustment in the life of the student. Due to this fact, it only seems plausible that during this period of extreme change and development that many alterations in "body awareness" will take place. For this reason the investigator has selected this age group of students to utilize as subjects.

Selection of Subjects

The subjects for this study were 155 girls enrolled in physical education classes at Northwood Junior High School in Richardson, Texas. The girls ranged in age from 11 years 2 months to 16 years 4 months. The subjects' grade level ranged from the seventh through the ninth grade.
Selection of Tests

The major problem in conducting a study that pertains to "body awareness" is the selection of an accurate testing device. The major reason for this is the lack of instruments to test this phenomenon. Many of the tests mentioned in the literature required that the test be administered by a professional in the field of psychological testing. With these limitations in mind the investigator selected the best testing devices available (that is, ones that have high validity, high reliability, and ones that will receive the most accurate results when administered by a non-professional).

The two tests selected to measure body awareness are the "Body Image Awareness Test" and "The Body Focus Questionnaire." The Body Awareness Test was used to "measure relative prominence of the subjects' body in his own perceptual field. This test is measured in terms of what lies within his awareness at a given time" (2, p. 11). The Body Focus Questionnaire was given to obtain information regarding the "relative prominence of various parts of the individual's body in his body schema. It attempts to ascertain the distribution of the individual's attention to the major aspects of his body" (2, p. 11).
Description of Tests

Body Awareness Test

Body Prominence Test. -- Each student was asked, in a group situation, to list on a sheet of paper "twenty things that she was most aware of, or conscious of, at this moment." The twenty responses given were scored by summing the number of references made to the body. Such references were defined to include explicit body designation (e.g., "My head hurts."); temperature, or kinesthetic sensations, eating experiences (e.g., "I would like to have a piece of pies."), and descriptions of one's own clothing (e.g., "My dress is green.").

Interscore agreement for two judgements for fifty-nine protocols was 95 per cent. The rationale for the measurement is the greater an individual's perceptual focus on his own body (or appropriate equivalents), the greater representation we should find in reports regarding the content of his awareness (2).

Body Focus Questionnaire.--The BFQ consists of 108 paired body areas. The subjects were given these directions:

Below is a list in which different areas of your body are listed in pairs. In each case select the area, or part, which is, at this moment most clear in your awareness. If your selection appears in the right column, blacken the letter "B" on your answer sheet. If your selection appears in the left column, blacken the letter "A" on your answer sheet. Do not write on the test booklet. Place all of your answers on the
The items were categorized into two body dimensions. The greater the frequency with which the items comprising that particular body dimension are selected as "most clear in awareness," the more perceptually prominent that dimension is considered to be (2).

**Gross Motor Tasks**

**Kicking Task.**--The kicking test was administered in the following manner. The subject stood behind a restraining line that was located twelve feet from the wall. It measured one and one-half feet from the floor to the top of the target, and measured two feet in width. A ball was placed behind the restraining line in a stationary position at the beginning of the test. The subjects were given these instructions regarding the test:

The object of this test is to kick the ball into the target five times. Your score will be the length of time that passes from the first kick of the ball till the ball lands in the target the fifth time. Any ball that lands on a line will be considered "good." You may kick the ball in any manner you wish with either foot you choose. When the ball rebounds from the wall you will be allowed to kick the ball again as soon as it crosses the restraining line, or replace the ball behind the line and kick it from that position (1).

**Hitting Task.**--The subject stood behind a restraining line twelve feet from the wall. On the wall was placed a target. The target measured fifty-three inches from the
floor to the top of the target. Using a paddle ball racket and tennis ball, the subjects were instructed to hit the ball into the target five times. The students were allowed to hit the ball as it rebounded from the wall or stop the ball each time it rebounded. It was required that each time the ball was stopped the student must drop the ball to the floor and hit it as it rebounded. The subject was asked to restart the ball in this manner each time it was stopped. The score for the test was the length of time that elapsed from the time the ball was dropped to the floor the first time and the fifth time the ball hit the target. Any ball that landed on a line was considered "good" (1).

Collection of Data

First Testing Day

**Orientation.**—When the subjects reported to class they were instructed to "suit-out" in their gym suits and report to their roll-call positions in the gymnasium. When each student was seated, these instructions were given:

I am conducting a research study in order to complete my masters thesis. I cannot, at this time, give you any information about the tests, what they mean, or how the scores will be handled. The tests will last approximately twelve days. The first ten days will be devoted to performing two different motor tasks. The last two days will be concerned
with gathering test data on two written tests. When the tests are completed and the results are available, I will explain to you the meaning and the purpose of each test you have performed. I would appreciate your cooperation.

Once the students were given these instructions, they were given an opportunity to ask questions. Questions asked were mostly concerned with topics such as these: "Why was I requested to test if you were only writing a paper?" "What is a thesis?" Would their names be used?, etc. No further information was given that related to the tests or to the nature of their importance.

Test Administration--The subjects were given these instructions prior to the administration of the motor task which involved kicking a ball into a target:

For the next five days you will participate in an experiment that involves kicking a ball into a target. If you will turn your attention to the center wall you will observe two targets. Students whose last names begin with letters A-L report to target A when their testing time arrives. Those students whose last names begin with letters M-Z will report to target B when their testing time arrives. While waiting your turn to be tested, you will remain in the dressing room lined up in alphabetical order. Group A will face an eastwardly direction and form a line down the left side of the showers while Group B facing eastwardly will form a line down the right side of the showers. You will be tested in groups of five. For example, the first five subjects in Group A will report to testing area A. At the same time the first five people in Group B will report to testing area B. The first subject in each group will then take her first trial on the kicking test. When she has completed
her first trial, she will return to the dressing room and send the next subject (No. 6 in line) in her line to the proper testing area. Those students waiting to take the tests will be seated in bleachers that are located in their testing area.

When these instructions were completed, the students were given an opportunity to ask questions regarding the instructions that were given. Each group of girls tested was given the same instructions.

When the questions were answered these instructions were given concerning the actual kicking test:

The purpose of this test is to kick the playground ball into the target five times. Your score will be the length of time it takes to complete the assignment. Any ball that touches a line will be considered "good." You will be given three trials at each motor task. After each trial return to the dressing room and send the next student in line to the testing area. The test must be started by kicking the ball from a stationary position behind the restraining line. You may kick the ball with either foot and in any manner you desire. You may stop the ball each time it rebounds from the wall or kick the ball continuously. If you stop the ball each time it rebounds, it must be returned to a stationary position behind the restraining line before it can be kicked again. You may not, at any time, kick the ball before it crosses the restraining line. If the ball fails to rebound across the restraining line, the student must retrieve the ball and return to the restraining line before kicking it again.

A demonstration was then given. After the demonstration the students were given an opportunity to ask questions regarding the directions that had been given. After the questions were answered the testing began.
Second Testing Day

Orientation.—The students were instructed to follow the same testing design that was explained for the first day.

Test Administration.—The subjects were tested in alphabetical order beginning with the next person in alphabetical order that had not been tested the previous day until each student had completed all three of the trials. At no time did a subject take more than one trial per day. Upon the completion of three trials by each subject the second motor task was given. It began the following day.

Third Testing Day

Orientation.—The students were instructed to line up in alphabetical order as they had done previously.

Test Administration.—The tests began with the next person in line after the last one tested the previous day. Test procedures were the same as were followed on the second day.

Fourth Testing Day

Orientation.—The students were instructed to line up in alphabetical order as they had done previously.

Test Administration.—The tests began with the next person in line after the last one tested the previous day.
Test procedures were the same as were followed on the second day.

Fifth Testing Day

Orientation.--The students were instructed to line up in alphabetical order as they had done previously.

Test Administration.--The tests began with the next person in line after the last one tested the previous day. Test procedures were the same as were followed on the second day.

Sixth Testing Day

Orientation.--When the students reported to class they were instructed to report to their roll-call positions. The same organization and procedures were followed for the hitting tests as were used in the kicking test. The instruments used in the test included a standardized paddle ball racket and a tennis ball. Students in Group A reported to testing area A and Group B reported to testing area B. The students were instructed to follow the same testing procedure concerning the manner in which they lined up and the order they were to follow.
Test Administration.--The students were then given these instructions regarding the hitting test.

Today you will begin participation in a hitting test. The object of this test is to hit the tennis ball into the target five times. The test will be started by dropping the ball to the floor and hitting it as it rebounds. Time will be started when the ball hits the floor after it has been dropped. If at any time the ball fails to rebound past the restraining line, or the subject loses control of the ball, she must retrieve the ball, return to a position behind the restraining line and begin to hit the ball again. The student must use the procedure described for "starting the test," each time the ball is stopped. The subject may hit the ball continuously or may stop the ball each time it rebounds from the wall. Any ball that hits on a line will be considered "good." As you complete each trial, report to the end of your line and await your next turn.

A demonstration followed. The students were then given an opportunity to ask questions. When the questions were answered the students returned to the dressing room and organized themselves in their proper positions. The testing was then started.

Seventh-Tenth Testing Days

Orientation.--Procedures were followed as they were previously described.

Test Administration.--On these days the testing proceeded in organized fashion until each subject had taken three trials on the hitting test. At no time did any subject take more than one trial per day.
Eleventh Testing Day

Orientation.—On the eleventh testing day the Body Prominence Test was administered. Each student reported to class dressed in her gym uniform and reported to her roll-call position. When each person was seated, these instructions were given:

In a few moments I will provide you with your testing materials. Do not mark on the paper until you are instructed to do so. Do not talk. When you have completed your assignment place your paper "face down" on the floor and raise your hand. When your paper has been collected you may quietly return to the dressing room and dress.

At this time the investigator distributed the test materials. The test booklet included one blank sheet of paper and one cover sheet. The cover sheet had blanks provided in order that the student could supply this information: name, age, and class period.

Test Administration.—When the tests had been distributed, the students were given these instructions: "Turn your attention toward yourself. List on the sheet of paper twenty things you are conscious and/or most aware of at this time—just anything at all" (2, p. 11).

As the subjects finished, their tests were collected and the subjects were dismissed to get dressed.
Orientation.—On the twelfth day the Body Focus Questionnaire was administered. The same seating procedure was used. The test booklet included a cover sheet and four pages on which 108 paired body words were listed. The words were listed in pairs vertically down the pages. The cover sheet had blanks provided for the following information to be recorded: name, age, and class period. When the students had all suited out and reported to their roll-call positions the following instructions were given:

In a moment I will distribute your testing materials. When you receive your test booklet, please provide the information requested on the cover sheet. When you have completed this, raise your hand. Be certain that each blank is filled in. When you finish this, wait for further directions.

Test Administration.—When the students had filled in the cover sheet and each had raised her hand, these directions were given:

When you complete the test, do not proof-read your paper or change any of your answers. Here are your instructions. Turn your attention toward yourself. On the following pages is a list of 108 paired words. The list contains words which refer to different areas of your body. On each line you will find two words. If your word selection is in Column A, blacken in the letter A on the answer sheet. If your answer is in Column B, blacken the letter B on the answer sheet. On each line select the area or part which is at that time most clear in your awareness. In other words, select the word which, at the moment, stands out most in your awareness (2).
When the students completed the test and raised their hands, the test booklets were collected. As each student raised their hand and their tests were collected, they were allowed to dress.

Scoring Procedures

Results for the motor performance test were placed on cards five inches in height and six inches in width. The cards contained spaces for this information to be recorded: name, sex, age, and class period. Space was provided for recording the three trials for each of the motor performance tests.

The data collected were analyzed by using the following statistical procedures: 2 x 2 factorial analysis of variance and 3 x 3 factorial analysis of variance.
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CHAPTER IV

PRESENTATION AND DISCUSSION OF FINDINGS

Presentation of Findings

Data for this study included the measurement of 155 junior high school girls on the performance of two gross motor tasks and two measures of body awareness.

In order to establish a relationship between the measures of body awareness and performance on the gross motor tasks, the data were analysed with a 3 x 3 factorial analysis. The total group of 155 subjects was divided into three sub-groups on the basis of their body awareness scores from the Body Prominence Test. The analysis was designed to determine the effects of the degree of total body awareness and grade level upon motor performance and the interaction between the two variables.

As one observes the means in Table I it appears that there is a difference in hitting performance between the groups exhibiting different degrees of body awareness and also different grade levels. The factorial analysis shown in Table II however, indicates that these observed differences were not statistically significant. The f ratio required for significance at the .05 level for the effects
of each variable was 3.06; for interaction it was 2.43.

**TABLE I**

MATRICES OF MEANS OF HITTING SCORES BY BODY AWARENESS GROUP AND GRADE LEVEL

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<thead>
<tr>
<th>BA Group</th>
<th>Grade Level</th>
<th>7th</th>
<th>8th</th>
<th>9th</th>
</tr>
</thead>
<tbody>
<tr>
<td>Low</td>
<td>152</td>
<td>117</td>
<td>121</td>
<td></td>
</tr>
<tr>
<td>Medium</td>
<td>139</td>
<td>120</td>
<td>125</td>
<td></td>
</tr>
<tr>
<td>High</td>
<td>123</td>
<td>116</td>
<td>128</td>
<td></td>
</tr>
</tbody>
</table>

*Scores for this study are represented in seconds, therefore, the lower scores represent the best performance.

**TABLE II**

SUMMARY OF ANALYSIS OF VARIANCE OF HITTING PERFORMANCE FOR BODY AWARENESS GROUPS AND GRADE LEVEL

<table>
<thead>
<tr>
<th>Source of Variance</th>
<th>$S^2$</th>
<th>df</th>
<th>$M^2$</th>
<th>f</th>
<th>P</th>
</tr>
</thead>
<tbody>
<tr>
<td>Grade Level</td>
<td>1267.3</td>
<td>2</td>
<td>633.6</td>
<td>0.376</td>
<td>NS</td>
</tr>
<tr>
<td>Awareness</td>
<td>10126.6</td>
<td>2</td>
<td>5063.3</td>
<td>3.007</td>
<td>NS</td>
</tr>
<tr>
<td>Grade and Awareness Interact</td>
<td>5768.6</td>
<td>4</td>
<td>1442.1</td>
<td>0.856</td>
<td>NS</td>
</tr>
<tr>
<td>Within</td>
<td>245768.9</td>
<td>146</td>
<td>16833</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
The means of the kicking scores, as shown in Table III, do not indicate the diversity of performance which was evident in the hitting scores. There is little variability in kicking performance between levels of body awareness or grade. The factorial analysis for this data, given in Table IV, revealed no significant differences in kicking as a result of the degree of body awareness or grade level and there was not a significant interaction.

Table III

MATRIX OF MEANS OF KICKING SCORES BY BODY AWARENESS GROUP AND GRADE LEVEL

<table>
<thead>
<tr>
<th>BA Group</th>
<th>Grade Level</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>7th</td>
</tr>
<tr>
<td>Low</td>
<td>52</td>
</tr>
<tr>
<td>Medium</td>
<td>48</td>
</tr>
<tr>
<td>High</td>
<td>51</td>
</tr>
</tbody>
</table>

The previous analysis of hitting and kicking performance involved the subject's total awareness of the body. It was also of interest in the study to determine whether a subject's awareness of his arms and legs might affect his performance of these motor tasks. Further analysis of the
data, therefore, involved a 2 x 2 factorial computation of
the subjects' responses on the Body Focus Questionnaire.
On the basis of scored references to the legs and arms, the
total group of subjects was divided in half; high degree of
leg awareness and low degree of leg awareness and the same
divisions were made for arm awareness.

TABLE IV
SUMMARY OF ANALYSIS OF VARIANCE OF KICKING PERFORMANCE
FOR BODY AWARENESS GROUPS AND GRADE LEVEL

<table>
<thead>
<tr>
<th>Source of Variance</th>
<th>SS</th>
<th>df</th>
<th>MS</th>
<th>f</th>
<th>P</th>
</tr>
</thead>
<tbody>
<tr>
<td>Grade Level</td>
<td>534.1</td>
<td>2</td>
<td>267.0</td>
<td>0.839</td>
<td>NS</td>
</tr>
<tr>
<td>Awareness</td>
<td>1759.6</td>
<td>2</td>
<td>879.8</td>
<td>2.764</td>
<td>NS</td>
</tr>
<tr>
<td>Grade</td>
<td>827.6</td>
<td>4</td>
<td>206.9</td>
<td>0.650</td>
<td>NS</td>
</tr>
<tr>
<td>Within</td>
<td>46,468.0</td>
<td>146</td>
<td>318.2</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Table V gives the means of hitting performance for the
upper and lower groups in leg and arm awareness. As shown
in Table VI, the factorial analysis did not indicate
statistically significant differences in performance between
the groups, nor was there significant interaction. The F
ratio needed for significance at the .05 level for both
the main effects and the interaction was 3.90.
TABLE V

MATRIX OF MEANS OF HITTING PERFORMANCE BY DEGREE OF ARM AND LEG AWARENESS

<table>
<thead>
<tr>
<th>Source of Variation</th>
<th>SS</th>
<th>df</th>
<th>MS</th>
<th>f</th>
<th>P</th>
</tr>
</thead>
<tbody>
<tr>
<td>Legs</td>
<td>4.797</td>
<td>1</td>
<td>4.797</td>
<td>0.0027</td>
<td>NS</td>
</tr>
<tr>
<td>Arms</td>
<td>1806.14</td>
<td>1</td>
<td>1806.14</td>
<td>1.0288</td>
<td>NS</td>
</tr>
<tr>
<td>Interaction</td>
<td>76.2848</td>
<td>1</td>
<td>76.7848</td>
<td>0.0435</td>
<td>NS</td>
</tr>
<tr>
<td>Within</td>
<td>265082.83</td>
<td>151</td>
<td>1755.51</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Analysis of the kicking performance showed a different pattern. There was an observed difference in kicking performance between the upper and lower leg and arm groups as shown in Table VII. The factorial analysis in Table VIII reveals that the main effects were not statistically significant but there was a significant interaction.
TABLE VII

MATRIX OF MEANS OF KICKING PERFORMANCE BY DEGREE OF ARM AND LEG AWARENESS

<table>
<thead>
<tr>
<th>Source of Variance</th>
<th>Upper Group Legs</th>
<th>Lower Group Legs</th>
</tr>
</thead>
<tbody>
<tr>
<td>Upper Group Arms</td>
<td>54</td>
<td>46</td>
</tr>
<tr>
<td>Lower Group Arms</td>
<td>44</td>
<td>52</td>
</tr>
</tbody>
</table>

TABLE VIII

SUMMARY OF ANALYSIS OF VARIANCE OF KICKING PERFORMANCE BY DEGREE OF ARM AND LEG AWARENESS

<table>
<thead>
<tr>
<th>Source of Variance</th>
<th>SS</th>
<th>df</th>
<th>MS</th>
<th>f</th>
<th>P</th>
</tr>
</thead>
<tbody>
<tr>
<td>Legs</td>
<td>123.6962</td>
<td>1</td>
<td>123.6962</td>
<td>0.3970</td>
<td>NS</td>
</tr>
<tr>
<td>Arms</td>
<td>0.7198</td>
<td>1</td>
<td>0.7198</td>
<td>0.0023</td>
<td>NS</td>
</tr>
<tr>
<td>Interaction</td>
<td>2490.5740</td>
<td>1</td>
<td>2490.5740</td>
<td>7.9924</td>
<td>.01</td>
</tr>
<tr>
<td>Within</td>
<td>47054.0729</td>
<td>151</td>
<td>311.6164</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Discussion of Findings

The assumptions upon which this study was based were that changes in body awareness would be evident in junior high school girls through the period covered by grades 7, 8, and 9; that the degree of one's awareness of her body would influence her performance on a gross motor task; and, the degree of awareness of a particular area of the body
would influence performance on a motor task that appeared to involve that area of the body in a predominant way.

Analysis of performance on the hitting and kicking tasks did not show any significant differences among grade levels or groups based on degree of total body awareness. When the mean scores were examined there appeared to be a substantial difference in performance of those subjects in the low and medium body awareness groups at the seventh grade level as compared to the same groups at other grade levels. This same pattern, however, did not occur with the kicking performance. A factor which could be contributing to differences in performance would be prior experience. Most seventh graders have had more experience with kicking than experience with hitting. There are some other interesting patterns evident in examination of the mean scores which depart from the basic assumptions previously mentioned. On both the hitting and kicking tasks, eighth graders had the best mean scores. On the hitting task, subjects in the seventh and eighth grades who had the highest degree of body awareness performed best on the motor task, but in the seventh grade it was subjects with a low degree of body awareness that had the best performance. In the kicking task, subjects in all three grades who had either high or low degrees of body awareness showed generally poor performance.
The third assumption was that awareness of a particular part of the body might affect performance and the effect could be obscured with a measure based on total body awareness. Using subgroups representing a high and low degree of awareness of the arms and legs, performance on the hitting and ticking tasks was analyzed for these effects. No significant main effects were found for either hitting or kicking performance. On the kicking task, however, the interaction between degree of leg awareness and degree of arm awareness was significant. Examination of the mean scores for kicking performance revealed that the interaction involved a high degree of awareness in one area, accompanied by a low degree of awareness of the other area. Best performance on the kicking task was by subjects who had a high awareness of the legs, but low awareness of the arms or high awareness of the arms and low awareness of the legs.

All of the basic assumptions previously mentioned revolved around the central contention that if an individual possessed high degree of awareness of his body or certain parts of it this would be an aid to his performance of a gross motor task. The general pattern evident from data in the study, however, seems to imply that a high degree of body awareness could interfere with performance.
Obviously this is an area which warrants further investigation and which does possess potentially important evidence for understanding motor performance as it relates to the total personality.
The purpose of this study was to determine the relationship between body awareness and the ability of junior high school girls to perform two gross motor tasks. Specifically, the study sought to answer these questions:

1. Is there a relationship between total body awareness and performance of two gross motor tasks?

2. Is there a relationship between the degree of body awareness toward the arm area and the ability to perform a task of hitting?

3. Is there a relationship between the degree of body awareness of the leg area and the ability to perform a task of kicking?

4. Is there a significant difference in the degree of body awareness at different grade levels?

5. Is there a significant difference in performance of gross motor tasks between the grade levels?

The investigator employed two instruments to determine the degree of body awareness among the subjects. The Body Prominence Test was administered to measure the awareness of the subjects body in his own perceptual field.
It measures the degree of awareness toward the body as it compares to other variables of the subject's environment. The Body Focus Questionnaire was employed to determine the subject's awareness of two body areas: the arm area and the leg area.

Two gross motor tasks were developed to measure the motor performance of the subjects; one of kicking a ball into a target and one of hitting a ball into a target. The score for both the motor task of hitting and the motor task of kicking was the length of time that was utilized to kick and hit the ball into the target five times. The subjects were given three trials at each of the two gross motor tasks.

Each motor task was scored individually. A score was obtained for the kicking task by computing the average length of time it required to complete all three trials. The same procedure was used in the hitting task.

The Body Prominence test was scored by summing the total number of references to the subject's body and any properties pertaining to his body, as they were differentiated from the environment.

The Body Focus Questionnaire was scored by summing the number of references made to each of two body areas designated in the test. A score was obtained by summing
the total number of references pertaining to the arm area and a total was derived for the total number of references to the area of the leg.

The statistical analysis used to interpret the data included a $2 \times 2$ factorial analysis of variance and a $3 \times 3$ factorial analysis of variance. The $2 \times 2$ factorial analysis was computated to determine the effect of high and low degrees of awareness toward the arms and legs upon hitting and kicking performance.

The $3 \times 3$ factorial analysis of variance was designed to determine the effects of degree of total body awareness and grade level upon performance on the two motor tasks.

The statistical analysis provided the following information:

1. There was no significant effect of degree of total body awareness or grade level upon hitting and kicking performance.

2. There was no significant effect on hitting performance of the degree of awareness of the arms or legs.

3. A significant interaction was obtained for kicking performance. Subjects who possessed a high degree of leg awareness but low degree of arm awareness, or a high degree of arm awareness and low degree of leg awareness performed best on the kicking task.
Conclusions

Based on the findings of this study, the following conclusions seem warranted:

1. Total body awareness as measured by the Body Prominence Test does not affect the performance of junior high school girls on gross motor tasks of hitting and kicking.

2. Performance of junior high school girls on hitting and kicking tasks is not significantly different from one grade level to another.

3. Performance of junior high school girls on hitting and kicking tasks does appear to be affected by awareness of specific areas of the body which are directly involved in these tasks.
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