DIFFERENCES THAT EXIST BETWEEN GIRLS WHO CHOOSE TO PARTICIPATE IN SPORT ACTIVITIES, AS OPPOSED TO GIRLS WHO CHOOSE TO PARTICIPATE IN VICARIOUS ACTIVITIES

> Thesis for the Degree of M. A. MICHIGAN STATE UNIVERSITY CLAUDETTE DUBILEWSKI 1974

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#### ABSTRACT

# DIFFERENCES THAT EXIST BETWEEN GIRLS WHO CHOOSE TO PARTICIPATE IN SPORT ACTIVITIES, AS OPPOSED TO GIRLS WHO CHOOSE TO PARTICIPATE IN VICARIOUS ACTIVITIES

Ву

Claudette Dubilewski

The primary purpose of this study was to investigate the effects that grade level, body type, body image, family size, sibling status, and parents' educational background have on determing the amount of time that girls in grades three, four, and five, devote to participation in sport activities as opposed to vicarious activities.

The sample for the study was selected from two elementary schools in Michigan. Heights and weights were obtained from 84 girls in grades three, four, and five. On the basis of heights and weights a ponderal index was computed for each subject. Each subject was administered a questionnaire to determine the amount of time that she devotes to the participation of sport activities as opposed to the participation in vicarious activities. The evaluation of each girl's body image was also derived from information obtained from the questionnaire. Parents' educational background, family size, and sibling status was obtained from the subjects' school records.

The data was analyzed by an unequal one way AOV. Where significant differences were noted, the Student Newman-Keuls Multiple Comparison Test was used to identify the categories between which the differences existed.

Findings indicated that the amount of time devoted to participation in sport activities varied between the third, fourth, and fifth grade. The amount of time devoted to participation in sport activities also varied according to body type by grade level. It was found that girls in grades three, four, and five, with no brothers and sisters devoted more time to participation in sport activities than did girls with brothers and sisters. It was also found that girls whose parents did not attend college devoted less time to participation in sport activities than girls whose parents had attended college.

No differences were found between body type, family size and body image when compared to the amount of time devoted to participation in sport activities by girls in grades three, four, and five. No differences existed between the variables under investigation and the amount of time devoted to participation in vicarious activities by girls in grades three, four, and five.



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Ву

 $Claudette^{\mathcal{R}}_{\Lambda}$ Dubilewski

A THESIS

Submitted to Michigan State University in partial fulfillment of the requirements for the degree of

MASTER OF ARTS

Department of Health, Physical Education and Recreation

To My Family

#### ACKNOWLEDGMENTS

To Dr. Vernal Seefeldt, my academic advisor, who gave so generously of his time and thought to make this thesis a reality;

To Dr. John Haubenstricker, Dr. William Heusner, and to Roland Roy, for their constructive criticisms, and helpful suggestions throughout the study;

To the students of Glenkarin and Okemos Central Elementary Schools, who so willingly acted as subjects for this research;

Go my sincere thanks and deepest appreciation.

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### CHAPTER I

# INTRODUCTION

Today a greater number of women are participating in sports then have ever participated before. There has, however, been little research regarding the physiological, sociological, and physical parameters of girls who choose to participate in sports. Why do some girls choose to engage in sport activities while others do not? What factors effect a girl's decision to participate in sport activities? To answer questions such as these, it is essential that investigators study children of all skill levels and from diverse backgrounds. Although educators have begun to realize the importance of such studies, there is little evidence to guide those who counsel students or structure and supervise the activity programs of girls.

Information is needed on all aspects of the female sport participant. In order for educators to promote and encourage sport participation they must be able to identify those factors which influence a young girl's decision to participate in sport activities. This study is designed to determine if a selected number of genetic and environmental

variables are influential in the activity choices and degree of participation in the sports available to young girls.

### Purpose of the Study

The purpose of this study is to investigate the effects that body type, body image, sibling status, family size, educational background, and grade level have on determining the amount of time that girls in grades three, four, and five, devote to sport activities as opposed to vicarious activities.

On the basis of the current literature and experimental evidence the following hypotheses are proposed:

1. Girls who have a mesomorphic body type will devote a greater amount of time to sport activities than girls who have an endomorphic or ectomorphic body type.

2. Girls with an older brother or brothers will devote more time to sport activities than girls without an older brother or brothers.

3. Girls whose preferred body type agrees with their own perception of their body type will devote a greater amount of time to sport activities than girls whose own perception of their body type differs from their preferred body type.

4. No difference will exist between family size and the amount of time devoted to sport activities.

5. No difference will exist between parents' educational level and time devoted to sport activities.

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### Scope of the Study

Girls in grades three, four, and five, from two Michigan elementary schools, were chosen as subjects for this study. The population is stratified with respect to body type. Only subjects with parental permission participated in the study. Heights and weights were obtained for each subject, and a ponderal index computed on this basis. Each subject was administered a questionnaire to determine the amount of time that she devotes to sports activities as compared to vicarious activities; the evaluation of each girl's body image was also derived from information obtained from the questionnaire. Parents' educational background and occupation will be taken from the school records of the students, along with family size, and the students' sibling status.

# Limitations of the Study

Results of the investigation are limited in respect to the following:

1. The sample selected is from girls in grades three, four, and five from East Lansing Central Elementary School and from Okemos Central Elementary School, both in the state of Michigan. Generalizations must therefore be limited to the characteristics exhibited by the selected subjects and the schools attended. 2. The method used for obtaining body type is the ponderal index; generalizations must therefore be limited to a general body type derived from this index rather than to somatotypes, i.e. endomorph, mesomorph, ectomorph.

3. Generalizations must be limited to the sensitivity of the questionnaire that was devised for this study.

# Significance of the Study

If definite differences can be established between girls who choose to participate in sport activities and those that choose not to participate, then educators may be able to use this information to adjust physical education and sport programs so that they provide for maximum participation during the formative years. Differences between performers will also provide information concerning the compatibility of various sports with selected genetic and environmental variables.

# Definitions

<u>Ponderal Index</u>: Is a general indicator of linearity or laterality. The ponderal index is obtained by dividing height by the cube root of weight.

<u>Somatotype</u>: The assessment of an individual's physique. A pathway along which the living organism is destined to travel under average conditions of nutrition and in the absence of grossly disturbing pathology.

Body Type: Refers to a person's physique, or an individual's body form.

Ectomorph: A body type characterized by leanness.

<u>Mesomorph</u>: A body type characterized by a dense skeleton and well developed muscles.

Endomorph: A body type characterized by a large abdomen and excessive fat.

Body Image: How an individual views ones' body configuration; the image that the individual has of himself as a physical person.

Sibling Status: Refers to the birth order and the sex of an individual in relationship to her brothers and sisters.

<u>Family Size</u>: The number of people in a single family unit.

<u>Socio-Economic Background</u>: Refers to both the social status and the economic level of a family or person.

<u>Vicarious Activities</u>: Refers to activities that require little or no physical energy. Such as reading, watching T.V., and sewing.

<u>Sport Activities</u>: Refers to structured physical activities and games that requires bodily exertion and are carried on according to some traditional form or set of rules.

#### CHAPTER II

### RELATED LITERATURE

The purpose of the study is to determine if differences exist between girls who choose to participate in sport activities, as opposed to girls who choose to participate in vicarious activities. Variables that were investigated included body type, body image, sibling status, family size, and socio-economic background.

### Theories of Somatotyping

Over the years many scientists, physicians, and educators have become increasingly concerned with human taxonomy. The need for an adequate classification of people became apparent as investigators began to identify relationships between body types and human behaviour. What was needed was a system for classifying physiques that would be continuous, practical and easily understood.

The first method developed for classifying physiques was termed somatotyping. It was developed by W. H. Sheldon in 1954. Sheldon's classification of physiques concentrates on body shape rather than body size. Through the use of photography, Sheldon has devised a system which

classifies physiques in terms of three components. The first component, Endomorphy, is characterized by a roundness of physique and a capacity to store fat. The second component, Mesomorphy, is characterized by well developed musculature. The third component, Ectomorphy, is characterized by linearity and leanness. Each of the three components is rated on a seven-point scale, using a three numeral index. To determine a subject's rating, photographs of the subject's front, side, and back are taken. The investigator then rates the subject on the three components, Endomorphy, Mesomorphy, and Ectomorphy. The investigator assigns a number between one and seven to each component, one being a low rating, and seven being the highest rating.

Sheldon's method of somatotyping has come under much criticism. Because of the subjective nature of photographic somatotyping, ratings of several investigators may vary for the same subject. Sheldon's method of somatotyping has also been criticized because of the costs of photographing subjects, and because the technique requires that subjects be photographed in the nude.

In order to objectify somatotype ratings, Parnell (1958) suggested that physical anthropometry be used along with the photographs. Parnell used three sets of measurement; bone diameters, muscle girths, and skinfolds. Heights and weights of each subject was also taken, and a ponderal

index computed. The ponderal index is equal to the height divided by the cube root of weight. Parnell used these measurements in order to obtain a phenotype of his subjects. The term phenotype characterizes the body as it appears at the moment the measurements are taken. The Parnell technique differs from Sheldon's somatotype in that the latter is an assessment of the body after it has ceased to grow.

One advantage of Parnell's method is that the art of body typing is more objective. Sheldon's method was limited to the somatotyping of men only. Parnell's method made it possible to obtain a phenotype for not only men, but women and children also. It was also possible to use the physical anthropometry portion of Parnell's method without using photographs of the subject. Use of only the anthropometry method also results in economy of time and money.

Heath (1963) modified the rating scale for somatotyping by increasing the range of the rating scales. Heath's scale began at zero and has no end point. Half intervals between whole rating points are assigned when appropriate, as in the seven-point scale. With the increase in the range of the scales, there is no arbitrary limitation to the sums of the three components. Heath's method included using anthroposcopic impressions along with height divided by the cube root of weight ratios.

Heath and Carter (1966) compared Parnell's and Heath's method of somatotyping. By using a series of 59 adult male subjects, and 61 adult female subjects, each method was tested. They also conducted a third investigation which was an adaptation of Parnell's method, in addition to Heath's method. It was the conclusion of the two authors, Heath and Carter, that Parnell's method fails to modify the weakness of Sheldon's somatotype method, and that the analyses of the anthropometric data basic to Parnell's method, when guided by Heath's method, would further objectify and simplify Heath's method, would improve agreement among independent raters, and would increase the usefullness of somatotyping as a research instrument.

The ponderal index is used as a general indicator of physique. Although not completely an adequate and accurate measure of body type, the ponderal index is being used as a general indicator of physique in a variety of studies involving children, stereotypes, and body image.

The ponderal index was chosen by Staffieri (1967) as a general indicator of body type. Staffieri investigated the role of body image stereotypes to development, interpersonal functions, and social functions. Staffieri obtained ponderal index numbers for 90 male children ranging in ages from six to ten. After obtaining index numbers the children were classified into three groups according to their index number as follows; a ponderal index number

of below 12.499 was classified as an endomorph, an index number between 12.500 and 12.999 was classified as a mesomorph, and an index number above 13.000 was classified as an ectomorph. The term endomorph was used to describe the typically fat individual, the term ectomorph was used to describe the thin individual, and the term mesomorph was used to describe the muscular individual. Staffieri reported a significant relationship between ponderal index ratings of his subjects and teachers' ratings of subject's body types of observation.

# Body Image

How an individual views their body is an important aspect of self-concept. Cortes and Gatti (1965) reported behavioral relationships that were specific to body type. Read (1968) suggests that physical educators should become increasingly concerned with body image because self-image can effect motor performance.

Body type silhouettes have been used by investigators to assess or determine body image. Dibiase and Hjelle (1968), Staffieri (1967), and Caskey and Felker (1971), all used silhouettes to represent the three basic body types, ectomorph, mesomorph, and endomorph. From these three silhouettes, subjects are instructed to select the silhouette which in their opinion most resembled themselves. In addition they selected a silhouette which represented

the body type that they would most like to resemble. Adjectives were then assigned by the subjects to the three basic body types silhouettes.

Using the silhouette method of assessing body image, Staffieri (1967) found that boys ages six through ten choose the mesomorphic body type as the one that they preferred as their own. Staffieri also concluded that even at an early age boys could successfully select their own body type.

Caskey and Felker (1971) conducting a similar study, found that girls in grades one through five chose the ectomorphic body type as the one most preferred by them. Differences in body type preference between boys and girls most likely is due to social stereotyping of males and females in our society.

# Sibling Status

The term sibling status refers to the birth order and sex of an individual in relationship to their brothers and sisters. Studies conducted over the past decade refers to birth order as ordinal position. Sutton-Smith and Rosenberg (1970) choose the term sibling status to refer to both ordinal position of the subject and the subject's sex.

It is known that sibling status does have an effect on an individual's personality and development. Initial research conducted in the area of ordinal position was concerned with the effects of birth order on achievement

and scholarship. Another largely investigated area was the effect of birth order on delinquent behavior, such as alcoholism, delinquency, insanity, and physical disability. The majority of research conducted in the area of ordinal position was concerned with the first born and second born child. In most of the early studies the survey method was used. In the last few years however, many of the studies being conducted on ordinal position, have been of the experimental nature. In these studies, subjects responded to stimuli in controlled situations.

Recent studies investigated have been in sex role preferences. Sutton-Smith and Rosenberg (1964) conducted a study in which they used game choice preferences as a determinent of masculinity and feminity. Their two scales consisted of 180 masculine and feminine games. Subjects then indicated their play preferences. The authors concluded that in two child families, boys with an older brother had significantly higher masculinity scores, and girls with sisters had significantly higher feminity scores.

In a later study conducted by Sutton-Smith and Rosenberg (1967) sibling interest preferences were investigated. An inventory was composed of games that were grouped into eight categories. These categories consisted of games of pure chance, chance and strategy, pure strategy, physical skill and strategy, pure physical skill, outdoor skill activities, social activities, and vicarious activities. The authors concluded that boys with older sisters showed fewer athletic interests and a greater preference for games of strategy. Girls with brothers showed more athletic interest and were also more social in their interests.

In other studies involving play interests Altus (1967) found that girls with brothers have more heterosexual interests. Koch (1956) reported that opposite sex siblings had more opposite sex playmates. In another study conducted by Sutton-Smith and Rosenberg (1964) using the Strong Inventory, the authors reported that boys with male siblings chose typical masculine occupations, while girls with female siblings chose typical female occupations.

Many of the studies conducted involving sibling status have looked at the two child family. Two children families make it possible for the investigator to study the first born male, the first born female, the first born male with the younger brother or younger sister, the first born female with the younger sister or younger brother, the second born male with the older brother or older sister, and the second born female with the older brother or older sister. It has been shown (Sutton-Smith and Rosenberg, 1965), that the second born female with an older brother was the least feminine and the least anxious on the Minnesota Multiphasic Personality Inventory at age nineteen. Kammeyer's study (1966) on sibling's attitude of siblings to female roles found that girls with an older brother had a more masculine

conception of female traits. In a study conducted by Altus (1966), it was shown that more second born females with older brothers tend to enter college than second born females with older sisters. Landers and Luschen (1966) reported that an overrepresentation of physical education majors were second born females with an older brother.

Landers (1970) investigated sibling sex status and ordinal position effects on females' sport participation and interests. Landers compared college physical education majors with education majors on their degree of sport and recreation participation. Five categories of sibling birth order was represented in Lander's study. These consisted of the only child, female, the second born female with an older sister, the first born female with a younger sister, the first born female with a younger brother, and the second born female with an older brother. Post hoc analysis of the data showed that the first born education major with a younger brother participated in significantly more masculine rated sports than did second born education majors with an older brother. Landers suggest that this finding may be due to certain power advantages, which may permit the first born female with the younger brother to interact for a longer period of time with her younger brother. A result of Landers' study that was consistent with previous findings was that the first born female with a younger sister was underrepresented among physical education majors.

Although the study of ordinal position and sibling sex is a relatively new area of investigation, it has been shown that brothers and sisters effect each others interests, activities, and occupational choice.

### Socioeconomic Status

Much has been done in the area of social mobility of athletes. It has been suggested (Hodges, 1964; Gregory, 1956; Andreano, 1965; and Charnosky, 1967) that athletes can provide an avenue for social mobility for many top athletes. There has been very little research however, concerning socioeconomic background and the desire to participate in sport activities.

It has been shown (McIntyre, 1959) that certain economic levels tend to participate in certain kinds of sports. McIntyre found that football players are characterized by a number of socio-economic factors which are not typical of other athletes, and that the socio-economic backgrounds of wrestlers are quite similar to those of basketball players and gymnasts.

In a study conducted at UCLA (Loy, 1968) the socioeconomic status of athletes in a variety of sport was investigated. Results of the study show that athletes from lower economic backgrounds participated in combative sports such as boxing and football, while upper-middle economic levels participated in sports such as golf, tennis, swimming, and

fencing. The differences for these choices of sports is obvious. Some sports require more money, different facilities, and more instruction than other sports.

A study that explored the relationship between socio-economic status and physical fitness measures was conducted by Ponthieux and Barker (1965). The AAHPER Youth Fitness Test was used as a measure of physical fitness. Subjects included boys and girls ages ten through twelve. The authors concluded that higher status socio-economic children tended to excel in some events, while lower status economic children excelled in others. The study did not find any one economic group that appeared to be in better physical condition than any of the other economic groups.

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### CHAPTER III

# RESEARCH METHODS

The purpose of this study is to investigate possible differences between girls who choose to participate in sports and girls who choose to participate in vicarious activities. The study will attempt to determine if differences in body type, body image, family size, sibling status and socio-economic background, may effect a girls decision to participate in sport activities.

# Subjects

Seventy-five girls, in grades three, four, and five, enrolled during the 1973-74 school year at Okemos Central Elementary School, and nine third, fourth, and fifth grade girls from East Lansing Central Elementary School, from the State of Michigan, will serve as subjects for the study. Each subject will be classified according to one of three body type classifications; ectomorph, mesomorph, and endomorph, by computing their ponderal index and then using Staffieri's (1967) criteria for classifying body types from ponderal index numbers. Only subjects with parental permission will participate in the study. Because of the limited number of endomorphs available at Okemos

Central Elementary School, the data of nine subjects in this category were chosen from the pilot study to complete the sample. It was possible to use subjects from the pilot study because the variables under investigation and the method of testing used in the study was not effected by the time or location of data collection.

### Research Design

The study is essentially an Ex Post Facto design because the independent variables, body type, body image, grade level, family size, sibling status, and parents' educational level, had already been established in the subjects and thus pre-assigns them to comparison groups.

Comparison groups obtained from the calculation of ponderal index were: Ectomorph, Mesomorph, and Endomorph. Comparison groups that were used when investigating sibling status were: single child families, girls with older brothers, girls with younger brothers, girls with older sisters, girls with younger sisters, girls with older and younger brothers, girls with older and younger sisters, and, girls with older and younger brothers and sisters. Comparison groups obtained for use when family size was compared were: families with two or less children, families with three or four children, and, families with five or more children. Comparison groups obtained from parents' educational background were: parents with four or more years of college training, parents with less than four years of college but at least one year,

families where neither parent had college training, families where one parent had at least four years of college while the other parent had at least one year but less than four, and, families where one parent had college training while the other parent did not attend college. Comparison groups obtained for use when body image was compared were: girls whose perception of their own body type agree with their preferred body type, and, girls whose perception of their own body type did not agree with their preferred body type. Comparison groups obtained for use when grade level was compared were: third, fourth, and fifth.

### Measures

A questionnaire consisting of 23 sport activities and 23 vicarious activities, along with three body type silhouettes, was administered to each subject. Because sport activities require the expenditure of physical energy, vicarious activities requiring little physical energy were chosen as alternatives to sport activities. In this way, girls who choose sport activities could be considered more physically active than girls who choose to devote most of their time to vicarious activities. The 46 activities were chosen from studies that investigated interests of elementary school aged children. Only activities which the investigator felt were familiar to third, fourth, and fifth grade girls were selected for use in this study. A pilot study

was conducted so that the questionnaire could be tested for readability and comprehension. Results of the pilot study indicated that the subjects were familiar with the activities chosen for use in the study.

The 46 activities chosen were randomly numbered, and a continuum of five categories was selected in order to determine the amount of time devoted by the girls in grades three, four, and five, to these activities. These choices consisted of "never," "seldom," "sometimes," "often," and "very often."

The questionnaire was also designed to determine body image of the subjects. As in other studies that investigated body image, three body type silhouettes were presented as possible choices for the subjects. It was decided that the silhouettes would consist of an apparent ectomorph, an apparent mesomorph, and an apparent endomorph. The silhouettes were chosen from Petersen's (1967) book of somatotyping children. Three girls were selected who were similar in height and had a somatotype rating of 126, 261, and 612 respectively. The three photographs were then shaded so that all features except the silhouettes were obliterated. Subjects were then asked to choose the silhouette which they felt most resembled their body type, and then choose the silhouette that they most preferred as a personal physique.

# Social Background Information

The subjects' family size, sibling status, and parents' educational level were obtained with parents' permission from school records. Family size was divided into three categories consisting of families with two or less children, families with three or four children, and families with five or more children. Sibling status was divided into eight categories consisting of subjects with older brothers, subjects with younger brothers, subjects with older sisters, subjects with younger sisters, subjects with older and younger brothers, subjects with older and younger sisters, and subjects with older and younger sisters and brothers. Parents' educational level was divided into five categories consisting of families where both parents have four or more years of college training, families where both parents have more than one year of college but less than four years, families were neither parent has any college training, families where one parent has four or more years of college while the other parent has less than four years but at least one year of college, and families where one parent has college training while the other parent does not.

### Determination of Body Type

Heights were obtained for each subject by use of an anthropometer. The weights of each subject was obtained by using a calibrated bathroom scale. (Note: Nine subjects

from the pilot study were used in the study. Heights and weights for these subjects were obtained from current school records.) After obtaining heights and weights for each subject, a ponderal index was calculated. The ponderal index is equal to the height devided by the cube root of weight, and was used as a rough estimation of body type. In keeping with the procedures of Staffieri (1967), subjects were categorized into three groups according to the following criteria:

Endomorph: A ponderal index below 12.499

Mesomorph: A ponderal index between 12.500 and 12.999 Ectomorph: A ponderal index above 13.000 Although the ponderal index is not a rigorous measure of determining body type, Staffieri did find a significant relationship between ponderal index and teacher's rating of body types.

# Procedure

A pilot study was conducted in April, 1974, to determine the effectiveness of the questionnaire. It was originally planned to obtain 15 endomorphs, 15 mesomorphs, and 15 ectomorphs as subjects for the pilot study. Although three elementary schools were part of the pilot sample, no endomorphs could be found among the fifth grade girls. Therefore 39 subjects were selected for the pilot study. These consisted of ten third grade ectomorphs, ten third grade mesomorphs, nine third grade endomorphs, ten fourth grade ectomorphs, ten fourth grade mesomorphs, ten fourth grade endomorphs, ten fifth grade ectomorphs, and ten fifth grade mesomorphs. Results indicated that the subjects had no difficulty in reading and understanding the questionnaire, and that most had participated in or were familiar with all of the activities. Also included in the pilot study were directions to indicate which three out of the 46 activities the subject enjoyed participating in the most, and which three of the 46 activities in which the subject did not enjoy participating. Results indicated that activities that were listed as being enjoyed most by the subject also were listed as being done "very often" or "often." Those activities listed as being least enjoyed often received ratings of "never" or "seldom." Because of the redundancy of the information, this part of the questionnaire was eliminated from the study.

Data was secured for the proposed study in May, 1974. Letters were sent to the parents of all the girls in grades three, four, and five at Okemos Central Elementary School. Seventy-five subjects out of a potential 120 received the permission of their parents to participate in the study. Weights of all the subjects were taken by use of a calibrated bathroom scale. The following day heights were obtained by use of a standard anthropometer. Subjects who were absent on either day were measured and weighed later in the week. Questionnaires were administered to the subjects over a three day period, directly proceding the recording of heights and weights. Directions were given verbally, as well as being printed on the top of each section of the questionnaire. Subjects were administered the questionnaire in groups of no more than ten, and were instructed that they would not be allowed to converse, but if they had any questions either in reading or understanding the questionnaire, they should not hesitate to raise their hand and the investigator would be there to help them. Through the aid of school records the family size, sibling status, and parent's educational and occupational background were obtained for each subject.

# Scoring and Recording

A ponderal index was calculated for each subject by dividing height by the cube root of weight. Subjects with a ponderal index of below 12.499 were classified as endomorph, subjects with a ponderal index between 12.500 and 12.999 were classified as mesomorph, and subjects with a ponderal index of above 13.000 were classified as ectomorph.

The questionnaire consisted of 46 activities (see appendix). Subjects had a choice of selecting one of five words that best described the amount of time that they devoted to the corresponding activity. A point value of one through five respectively, was assigned to the words "never," "seldom," "sometimes," "often," and "very often."

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Point values for sport and vicarious activities were thus obtained by summing the total number of points on each questionnaire.

# Treatment of the Data

Data was evaluated by using an unequal one way AOV. It was possible to use an Analysis of Variance because the dependent variables, sport and vicarious activites, were quantitative data, while the independent variables, grade level, family size, sibling status, body image, and parents' educational background were qualitative data.

# Significance Level

The .05 level of significance was selected for use in this study because it agrees with that conventionally used in education, and the results of the data being analysed do not necessitate expensive equipment or extensive curricular reorganization.

#### CHAPTER IV

# RESULTS AND DISCUSSION

The results and discussion are presented in two parts. Genetic factors will be compared with the amount of time devoted to vicarious activities. Social background information on the subjects will be compared to the amount of time devoted to sport activities, and to the amount of time devoted to vicarious activities. The following variables will be discussed: grade level, body type, family size, sibling status, parents' educational level, and body image.

### Genetic Information

Significant findings were detected between the amount of time devoted to sport activities and grade level, and between the amount of time devoted to sport activities and body type by grade level. Tables 1 (see page 27) and 2 (see page 27) depict mean totals and frequency of these significant findings. An unequal one way AOV was used to determine if differences between groups were due to chance alone. Where significant differences were noted, the Student Newman-Keuls Multiple Comparison Test was used to identify the categories between which the differences existed.

	Mean Totals o	f Group Sp	port Activities
Grade	Sum	n	Means
3	996.00	18	55.33
4	2616.00	38	68.84
5	1811.00	28	64.68

TABLE 1.--Mean Totals of Sport Activities by Grade Level.

Approximate Significance Probability of F Statistic Between Categories = .001

TABLE 2.--Mean Totals of Sport Activities by Body Type and Grade Level.

Mean	Totals of	Group Sport	Activities
Body Type by Grade Level	Sum	n	Means
Third Grade Ectomorph Third Grade Mesomorph Third Grade Endomorph Fourth Grade Ectomorph Fourth Grade Mesomorph Fourth Grade Endomorph Fifth Grade Ectomorph Fifth Grade Mesomorph Fifth Grade Endomorph	560.00 $125.00$ $311.00$ $1456.00$ $610.00$ $550.00$ $1276.00$ $472.00$ $63.00$	10 2 6 21 9 8 20 7	56.00 62.50 51.83 69.33 67.78 68.75 63.80 67.43 63.00
Approximate Significance Categories = .042	Probability	y of F Statis	stic Between

Mean Totals of Group Sport Activities

# Grade Level

A significant difference was found between girls in grades three, four, and five, and the total amount of time devoted to sport activities. Table 1 shows the mean scores of the total amount of time devoted to participation in sport activities by girls in grades three, four, and five. The mean amount of time devoted to participation in sport activities was lowest among the third grade girls and highest among the fourth grade girls. The Student Newman-Keuls Multiple Comparison Test was used to determine if there was a significant difference within the three categories of grade level. Due to the robust nature of the Student Newman-Keuls Test no significance was found. It is interesting to note however, that the amount of time devoted to sport activities by the fifth grade girls was less than the amount of time devoted by the fourth grade girls. One possibility for this occurance may be due to the onset of puberty in some girls at the fifth grade level. Girls entering puberty may become self-conscious about their bodies and may decide not to participate in sport activities as frequently as they did during prepubertal ages. It is also possible that girls at this age develop a greater concern with their feminine image and may thus participate less in sports because they feel that sports are an unfeminine activity.

No significant differences were found between the three grade levels and the amount of time devoted to vicarious activities. Although no differences were detected, the means of these three groups show that the third grade Girls devoted the least amount of time to vicarious activities while the fourth grade girls devoted the greatest amount of time to these activities. The fifth grade girls participated to a greater extent in vicarious activities than the third grade girls, but less than the fourth grade girls.

# Body Type

Although no significant difference was found between body type and participation in sport activities or between body type and participation in vicarious activities, the mesomorphic girls devoted a greater amount of time to sport and vicarious activities, while the endomorphic girls were the least active in both categories; namely, actual sport participation and selection of vicarious activities. The mean scores of the ectomorphic girls on the amount of time devoted to sport and vicarious activities fell between the mean scores of the endomorphs and the mesomorphs. This result was expected because the mesomorphic physique is more compatable with sports participation that requires strength, power, and endurance, than the endomorphic or ectomorphic physique. This pattern of responses for

vicarious as well as actual sport activities may be explained by the fact that endomorphs on the whole tend to be less active in most areas than the mesomorphs.

There was a significant difference (.042) between body type and grade level (see Table 2, page 27). The third grade endomorphic girls devoted the least amount of time to participation in sport activities. This finding is attributed to the significant difference that existed between grade level and sport participation, rather than to differences in body type.

No significant differences existed between the amount of time devoted to vicarious activities when compared to body type by grades level. Because no significant differences was between the amount of time devoted to vicarious activities when compared by body type, it seems logical that when body type by grade level is compared to the amount of time devoted to vicarious activities, that no significant difference was found.

# Summary of Results of Genetic Information

In summary, no significant differences were found between: (1) body type and participation in sport activities; (2) body type and participation in vicarious activities; (3) grade level and participation in vicarious activites; (4) participation in vicarious activities by body type and grade level. Significant differences were detected between

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grade level and time devoted to sport activities, and between body type by grade level and time devoted to sport participation.

#### Social Background Information

Significant findings were detected between sport activities and sibling status, and between sport activities and parent's educational level. Tables 3 and 4 (see page 33,35) depict mean totals and frequencies of these significant findings. An unequal one way AOV was used to determine if differences between groups were due to chance alone. In comparisons where significant differences were noted the Student Newman-Keuls Multiple Comparison Test was used to identify the categories between which the differences existed.

# Family Size

There were no significant differences between family size and the amount of time devoted by girls to sport activities. There was also no difference between family size and the amount of time devoted to vicarious activities. One possibility for this occurance may be that the size of a family does not alter the opportunity to participate in a variety of activities.

# Sibling Status

A significant difference existed between sibling status and the amount of time devoted to participation in

sport activities. Table 3 (see page 33) shows the mean scores of the total amount of time devoted to participating in sport activities by girls with older brothers, younger brothers, older sisters, younger sisters, older and younger brothers, older and younger sisters, older and younger brothers and sisters, and of those with no brothers and sisters. A post hoc test was used to determine where the significant differences occured within the eight categories of sibling status. The analysis of sibling status revealed that the single child category differed significantly from the other categories in the amount of time devoted to sport activities. Girls who were only children participated in sports more often than girls who had older brothers, younger brothers, older sisters, younger sisters, older and younger brothers, older and younger sisters, and older and younger brothers and sisters. A possible explanation for this finding is that parents with one child may have more time to transport the child to sport activities. Thev may also have greater economic resources for recreational purposes, such as tennis lessons or equipment since the available finances are not divided between siblings. Parents of a single child may also encourage more participation in sport activities as a means of socialization.

It is interesting to note that girls with older brothers did not participate more frequently in sport activities than one child families. Girls with older or

younger sisters participated in sport activities less than girls with older or younger brothers, although this difference did not reach statistical significance. No significant differences were found between the eight categories of sibling status and the amount of time devoted to vicarious activities.

	Mean Totals of	Group Sport	Activities
Sibling Status	Sum	n	Mean
Only Child	321.00	4	80.25
Older Brother	319.00	5	63.80
Younger Brother	747.00	11	67.91
Older Sister	621.00	11	56.45
Younger Sister	535.00	9	59.44
Older and Younger Brother	133.00	2	66.50
Older and Younger Sister	286.00	5	57.20
Older and Younger Brother and Sister	2223.00	33	67.36
Approximate Significan Categories = .014	ce Probability	of F Statist	ic Between

TABLE 3.--Mean Totals of Sport Activities by Sibling Status.

# Educational Level

A significant difference was found between categories of parents' educational level and the amount of time devoted to participation in sport activities. Table 4 (see page 35) shows the mean scores of the total amount of time devoted to sport participation by girls from families where both parents completed four or more years of college, families where both parents attended at least one year of college but less than four, families where neither parent had attended college, families where one parent attended college while the other did not, and families where one parent has at least four years of college while the other has less than four years but at least one year of college training. A post hoc test determined that significant differences existed between girls whose parents had no college education, and those whose parents had varying amounts of college training or where one parent had college training while the other did not. Girls from families where neither parent attended college devoted less time to participation in sport activities. This may be explained by the possibility that college attendance may have led to an introduction to sports as a form of leisure activity. A college degree may also have placed the recipient in a higher socio-economic level, thus providing the means to purchase sport equipment and the opportunities to participate in various sport activities.

No significant differences were found between parents' educational level and the amount of time devoted to vicarious activities. This may be due to the fact that the vicarious participation in activities is less dependent on money and environment.

	Mean Total	s of Sport	Activities
Educational Level	Sum	n	Mean
Four or more years of college	2507.00	40	62.68
Less than four years of college	192.00	3	64.00
No college training	270.00	5	54.00
One parent with college and one without	1016.00	15	67.73
One parent with four years of college and one with less than four	1200.00	17	70.59
Approximate Significance Categories = .049	Probability	of F Statis	stic Be <b>twe</b> en

TABLE 4.--Mean Totals of Sport Activities by Parent's Educational Level.

# Body Image

Subjects whose "preferred body type" agreed with their perception of their own body type were compared with those subjects whose "preferred body type" did not agree with their own perception of their body type, in the amount of time devoted to sport activities and the amount of time devoted to vicarious activities. No significant differences were found between either of the two groups. One possible explanation for this finding may be that the majority of the girls (63%) chose the ectomorphic body type as the one they preferred. Therefore girls who were not ectomorphs may have chosen to disagree between their "preferred body type" and their own perception of their body type. Those with an ectomorphic body type may have chosen the category where their "preferred body type" agreed with their own perception of their body type, thus coinciding with previous findings of no difference between ectomorphs, mesomorphs, and endomorphs when compared to the amount of time devoted to sport and vicarious activities.

# Summary of Results of Social Background Information

In summary, differences were found between girls who come from one child families and girls who had sisters or brothers, pertaining to the amount of time devoted to sport activities. Differences were also found between girls whose parents did not attend college when compared to girls who came from families where at least one parent had a college education.

No differences were detected between: (1) family size and participation in vicarious activities and between family size and participation in sport activities; (2) sibling status and vicarious activities; (3) parents' educational levels and participation in vicarious activities; and (4) body image and participation in sport and vicarious activities.

#### CHAPTER V

# SUMMARY AND CONCLUSIONS

The primary purpose of this study was to investigate the effects of body type, body image, grade level, family size, sibling status, and parents' educational background on determining the amount of time that girls in grades three, four, and five devote to sport activities as opposed to vicarious activities.

Girls in grades three, four, and five, were chosen from two Michigan elementary schools as subjects for this study. The population was stratified with respect to body type. Only subjects with parental permission participated in the study. Heights and weights were obtained for each subject, and a ponderal index computed on this basis. Subjects were placed into one of three categories (ectomorph, mesomorph, and endomorph) according to their ponderal index.

Subjects were administered a questionnaire consisting of 23 sport activities and 23 vicarious activities, along with three body type silhouettes. The 46 activities chosen were then randomly numbered, and a continuum of five categories was selected in order to determine the amount of time devoted by girls in grades three, four, and five

to these activities. Subjects were instructed to choose between one of five phrases, which best described the amount of time that they devoted to each of the 46 activities on the questionnaire. These choices consisted of "never," "seldom," "sometimes," "often," and "very often." The questionnaire was also designed to determine the body image of the subject. Silhouettes consisting of an apparent ectomorph, mesomorph, and endomorph were shaded so that all features except the silhouettes were obliterated. The subjects were asked to choose the silhouette which they thought most resembled their body type, and then were also asked to choose the silhouette that they most preferred as a personal physique.

The subject's family size, sibling status, grade level, and parent's educational background were obtained with parental permission from the school records. Family size was divided into three categories consisting of families with two or less children, families with three and four children, and families with five or more children. Sibling status was divided into eight categories consisting of girls with older brother, girls with younger brothers, girls with older sisters, girls with younger sisters, girls with older and younger brothers, girls with older and younger sisters, girls with older and younger brothers and sisters, and girls with no brothers and sisters. Parent's educational background was divided into five

categories consisting of parents with four or more years of college, parents with at least one year but less than four years of college, parents who never attended college, families where one parent attended college and the other did not, and families where one parent completed at least four years of college while the other attended college less than four years. Body image was classified into two categories consisting of those girls whose preferred body type agreed with their perception of their own body type, and girls whose preferred body type did not agree with their perception of their own body type.

It was hypothesized that differences existed between the mesomorphic body type and the endomorphic and ectomorphic body type when compared to the amount of time devoted to the participation of sport activities. Girls with older brothers were expected to devote a greater amount of time to participation in sport activities. Girls whose preferred body type agreed with their own perception of their body type were expected to devote a greater amount of time to sport participation. No differences were hypothesized between family size and the amount of time devoted to sport participation, and between parents' educational background and the amount of time devoted to sport participation.

Based on the findings of this study the following conclusions were justified:

1. The amount of time devoted by girls to participate in sport activities varies with grade levels.

 The amount of time devoted by girls in grades three, four, and five, varied according to body type by grade level.

3. Girls with no brothers and sisters devoted more time to participating in sport activities than did girls with brothers and sisters.

4. Girls whose parents did not attend college devoted less time to the participation in sport activities.

#### Suggestions for Future Research

Information is still needed on all aspects of female sport participation. Further investigation seems to be warranted into the genetic and environmental factors that may influence a child's decision to participate in sport activities if we are to promote and encourage sport participation.

Specific suggestions that relate to this study are as follows:

1. Children of all races and economic background should be studied so that we may investigate as many genetic and environmental factors as possible as they relate to interest in sport participation.

2. The use of photographic and anthropometric methods of somatotyping physiques should be encouraged so that we may obtain a more accurate measure for classifying body types.

3. Information concerning the influence of parental attitudes on their child's interests and activities was not obtained in this study but this variable may account for a major portion of the difference between the activity preferences of children. The impact of this variable should be considered in future investigations. APPENDIX

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# Questionnaire

DII	RECTIONS:	Next a cir the a activ	to eac ccle ar amount vity.	ch of th cound th of time	ne follo ne word e you ma	wing a that h y sper	activit Sest ir Nd doir	ties dra ndicates ng the	1W 5
EX	AMPLE: Fig	shing	Very	Often	Often	Someti	imes S	Seldom	Never
1.	Baseball	Very	Often	Often	Someti	mes S	Seldom	Never	
2.	Cooking	Very	Often	Often	Someti	mes S	Seldom	Never	
3.	Golf	Very	Often	Often	Someti	mes S	Seldom	Never	
4.	Reading	Very	Often	Often	Someti	mes S	Seldom	Never	
5.	Day- Dreaming	Very	Often	Often	Someti	mes S	Seldom	Never	
6.	Ballet	Very	Often	Often	Someti	mes S	Seldom	Never	
7.	Tennis	Very	Often	Often	Someti	mes S	Seldom	Never	
8.	Talking	Very	Often	Often	Someti	mes S	Seldom	Never	
9.	Sewing	Very	Often	Often	Someti	mes S	Seldom	Never	
10.	Running Races	Very	Often	Often	Someti	mes S	Seldom	Never	
11.	Kickball	Very	Often	Often	Someti	mes S	Seldom	Never	
12.	Checkers	Very	Often	Often	Someti	mes S	Seldom	Never	
13.	Going Shopping	Very	Often	Often	Someti	mes S	Seldom	Never	
14.	Softball	Very	Often	Often	Someti	mes S	Seldom	Never	
15.	Singing	Very	Often	Often	Someti	mes S	Seldom	Never	
16.	Watching T.V.	Very	Often	Often	Someti	mes S	Seldom	Never	
17.	Swimming	Very	Often	Often	Someti	mes S	Seldom	Never	
18.	Bicycling	Very	Often	Often	Someti	mes S	Seldom	Never	
19.	Knitting	Very	Often	Often	Someti	mes S	Seldom	Never	

20.	Going to the movies	Very s	Often	Often	Sometimes	Seldom	Never
21.	Dodgeball	Very	Often	Often	Sometimes	Seldom	Never
22.	Telephon- ing	Very	Often	Often	Sometimes	Seldom	Never
23.	Diving	Very	Often	Often	Sometimes	Seldom	Never
24.	Drawing	Very	Often	Often	Sometimes	Seldom	Never
25.	Skiing	Very	Often	Often	Sometimes	Seldom	Never
26.	Riding in the car	Very	Often	Often	Sometimes	Seldom	Never
27.	Basket- ball	Very	Often	Often	Sometimes	Seldom	Never
28.	Jumping Rope	Very	Often	Often	Sometimes	Seldom	Never
29.	Collecting Things	g Very	Often	Often	Sometimes	Seldom	Never
30.	Soccer	Very	Often	Often	Sometimes	Seldom	Never
31.	Painting	Very	Often	Often	Sometimes	Seldom	Never
32.	Visiting	Very	Often	Often	Sometimes	Seldom	Never
33.	Gymnastic	s Very	y Often	Often	Sometimes	Seldom	Never
34.	Listening to Music	Very	Often	Often	Sometimes	Seldom	Never
35.	Bowling	Very	Often	Often	Sometimes	Seldom	Never
36.	Touch Football	Very	Often	Often	Sometimes	Seldom	Never
37.	Making Things	Very	Often	Often	Sometimes	Seldom	Never
38.	Horseback Riding	Very	Often	Often	Sometimes	Seldom	Never
39.	Cards	Very	Often	Often	Sometimes	Seldom	Never
40.	Ice Skating	Very	Often	Often	Sometimes	Seldom	Never

41.	Writing Letters	Very	Often	Often	Sometimes	Seldom	Never
42.	Field Hockey	Very	Often	Often	Sometimes	Seldom	Never
43.	Volley <del>-</del> ball	Very	Often	Often	Sometimes	Seldom	Never
44.	Playing a musical instrumen	Very t	Often	Often	Sometimes	Seldom	Never
45.	Roller Skating	Very	Often	Often	Sometimes	Seldom	Never
46.	Playing Board Games (such as monopoly)	Very	Often	Often	Sometimes	Seldom	Never

Below are three drawings of girls about the same age as you. Please look at them carefully and answer the following questions:

- What figure looks most like you? \_\_\_\_\_\_
- 2. What figure would you most like to look like?







Summary	Sheet
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Name of Student	Grade		
Family Size	Sibling Status		
Father's Occupation			
Mother's Occupation			
Height			
Weight			
Ponderal Index			
Body Type			
Point Value of Sport Activities			
Point Value of Social and Vicarious Act	tivities		
Self Concept of Body Type			
Preferred Body Type			

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#### LIST OF REFERENCES

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